

20:1 Brewer Operation and Service Manual



20:1 Dual AP Brewer

PN	Model	Height	Width	Depth	Volts	Watts	Ship Wt
121767	20:1 Dual AP	19.1"	17.9"	18.5"	120	1750	48 lbs.

WARRANTY

Applies to all equipment manufactured after 2/1/2017. This warranty supersedes all other previous warranties that are currently in manuals.

- Newco warrants equipment manufactured by it for 1 year parts and labor.
- Accessories and Dispensers 1 Year parts only.
- Electronic Circuit and Control Boards- 3 years parts, 1 year labor.
- Equipment manufactured by others and distributed by Newco- please see original equipment manufacturers warranty, Newco will follow.

These warranty periods run from the date of sale Newco 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 Newco or that, in Newco's judgment, has been affected by misuse, neglect, alteration, improper installation or operation, relocation or reinstallation, improper maintenance or repair, incorrect voltage applied to the unit at any time, damage or casualty. This warranty does not apply to any equipment failures related to poor water quality, excessive lime and chlorine and non periodic cleaning and descaling. Warranty is null and void if muriatic or any other form of hydrochloric acid is used for cleaning or deliming. In addition, this warranty does not apply to replacement of items subject to normal use including but not limited to user replaceable parts such as faucet seat cups, sight gauge tubes, washers, o-rings, tubing, seals and gaskets.

This warranty is conditioned on the Buyer 1) giving Newco prompt notice of any claim to be made under this warranty by telephone at (800) 556-3926 or by writing to **3650 New Town Blvd, Saint Charles, MO 63301**; 2) if requested by Newco, shipping the defective equipment prepaid to an authorized Newco service location; and 3) receiving prior authorization from Newco 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 Newco are not authorized to make modifications to this warranty or to make additional warranties that are binding on Newco. Accordingly, statements by such individuals, whether oral or written, do not constitute warranties and should not be relied upon.

If Newco determines in its sole discretion that the equipment does not conform to the warranty, Newco, 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 Newco Authorized Service Representative; or 2) shall replace the equipment or refund the purchase price for the equipment.

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

In no event shall Newco 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.



Notice of Update to 20:1 Control Board Hardware and Firmware

Effective May 18th of 2009 the 100729-2 control board hardware has been modified to:

- Improve the performance of the water level circuit
- Improve accuracy
- Eliminate the occurrence of an E-5 error

Several firmware modifications were also done to reduce the likelihood of a misinterpreted error leading to a service call. These include:

- Change to software for water level control corresponding to the hardware changes
- Change to E-5 error checking
- Thermistor error handling to remove display of a single thermistor error when in idle mode. A displayed thermistor error outside of service data mode now indicates that the brewer must be serviced before it can operate again. Individual thermistor errors may be viewed in service data mode. As always, the brewer can run with one thermistor if the other thermistor is open or shorted. Thermistors with invalid values should be replaced. See service data mode.

Compatibility Notes:

This updated control will serve as a drop in replacement for previous 20:1 control boards except for those used in dual head brewers. The option to use the board in a dual brew head unit has been removed to conserve memory space. Future board revisions with larger memory will be available that will allow operation of either dual head or single head brewers with the same control.

Firmware that is version 9 or above should not be used except in an updated level 2 or newer control board. Firmware below level 9 should not be used in an updated level 2 or newer control board. Call Newco tech support if in doubt as to board revision levels or firmware compatibility. Some programming steps, error messages, settings, or displayed items may have changed. Refer to specific instructions on the following pages for details.

20:1 INSTALLATION / SETUP INSTRUCTIONS

WARNING: - Read and follow installation / setup instructions before plugging or wiring in machine to electrical circuit. Warranty will be void if machine is connected to any voltage other than that specified on the name plate.

Plumber's Installation Instructions

- 1) Plumb brewer in to water supply using 1/4 inch copper tubing. Flush water line before installing brewer to remove sediment. Brewer should be connected to COLD WATER LINE for best operation.
- 2) Water pressure should be at least 20 lbs. For less than a 25 ft run, use 1/4" tubing and connect to 1/2" or larger water line. The inlet water fitting on the back of the brewer is a 1/4" flare fitting.
- 3) If installed with saddle valve, the valve should have a minimum of 1/8" port hole for up to 25 ft run, and 5/16" port hole for over 25 ft runs.
- 4) Check for leaks.

Initial Setup Instructions

Ensure power switch on right rear of unit is in the off position. Plug or wire brewer to the appropriate voltage circuit as indicated on the serial tag. Turn power switch to the on position. Brewer tank will begin to fill. Once the tank is full the brewer will begin to heat. Ready light will come on to indicate tank has finished heating.

CAUTION: The water faucet will dispense hot water anytime the handle is pulled.

Programming

The brewer has two program modes, service mode and user mode. The service mode is used to establish basic operating parameters of the unit while the user mode allows the three buttons to be programmed for brewing into various containers or for varying beverage volumes. Programming mode is initiated as outlined below. The following will outline the various steps as displayed by the programming "screens". The screens will loop continuously until exiting the mode.

Service Mode is entered by holding any two of the buttons on the face of the machine while powering up the brewer. The brewer firmware revision number is displayed for a couple of seconds when entering this mode. The table below list the items that may be programmed along with available values or settings. Use the center brew button to advance through the items and the left and right button to decrement or increment the values/selection respectively. These items are programmed at the factory and will typically not need adjustment.

Item Selected	Screen Example	Values Available	Comment
Water Temperature	200	170-205	Degrees F
End of Cycle Beeper	On	On, OFF	Used to audibly indicate brew cycle has completed with a series of beeps.
Brew Pump Speed	b:05	1-10	Pump speed used for brewing
Not Used	F:05	1-10	No effect. Unused feature.
Pump Calibration	CAL	N/A	See instructions below. Must be done if pump speed modified.
Volume Delivered During Calibration Step	39.0	16.0-99.9	Ounces. Only displays if calibration cycle was run.
Water Fill Flow Rate	0.30	Off, 0.05-1.40	Adjustable in increments of .05 GPM. Should match flow rate through valve.
Water Filter Capacity	100	Off, 500-2500	In tens of gallons. 50=500 gallons. Increments are 500 gallons.
Power Mode	nor	nor, SAV, dn	Normal, Power Down, or Power Save.
Power Down/Save Time	4:00	0:30-4:00	Hours:Minutes from last brew until brewer enters the selected power mode. No effect if mode is "Off".
Brew Counter	0-999	N/A	Shows number of brew cycles since last reset (up to 999).
Service Data	Srv	N/A	Used to view temperature & probe data. See Service Data below.
Exit	End	N/A	Use left or right button when displayed to exit this mode.

Pump calibration is necessary when the pump speed is changed or if the brewer is delivering substantially more or less beverage than what it has been programmed for in the user mode. Pump speed may be adjusted up or down if required to deliver water at a faster or slower rate to meet a specific beverage taste profile. Calibration tells the brewer control how much hot water is delivered within a specific time frame so it can adjust the time required to run to deliver the desired brew volumes.

Ensure the brew basket is in place. Place a suitably graduated container in place below the brew basket to capture and measure the water delivered. To calibrate, enter the service mode as noted above and advance to the “CAL” screen. Press either the left or right brew button and water delivery will begin. If the brewer has not reached operating temperature, it will finish heating before automatically starting. The pump will cycle on and off for approximately 2 minutes at which time the currently programmed volume is displayed. Use the left and right button to decrement or increment the value to the measured value. For better accuracy, you may want to measure a couple of cycles and average the measured values. At the least, the system should be primed before calibration by allowing a partial brew cycle to run (10-15 secs). Note: User mode will be entered automatically when exiting the service mode if calibration values have been changed.

Service Data consist of the tank temperature as measured at two points in the tank and an indication as to which probe(s) are making contact with the water. To view data, enter the service mode as noted above and advance to the “Srv” screen. Use the left or right button to enter service data mode. Use the center button to advance through the data. The table below list the data that is displayed. Changed for firmware rev 9+

Data displayed	Screen Example	Values Available	Comment
Lower Temperature	198	N/A	Degrees F, OPn, SHr, - - -*
Upper Temperature	20-0	N/A	Degrees F, OPn, SHr, - - -*
Probes	1:LH	L,H,LH	Displays probes in contact with the water; L, H, or Both (where both probes are installed).
Exit	End	N/A	Use left or right button when displayed to exit this mode.

* The 3 dashes indicate that the temperature value reported by the thermistor is outside the display range, 100-215F. This could be because the tank is cold or because the thermistor is out of calibration. If the tank temperature is within the noted range, the thermistor is defective and should be replaced.

User Mode is entered by holding any of the buttons on the face of the machine while powering up the brewer. Note that the user mode is also automatically entered whenever the calibration volume setting is changed. The beverage volume, brew time, and visa-brew time can be programmed for each of the three buttons on the face of the brewer. The brewer will determine the minimum brew time possible based on pump speed and calibration values as outlined previously. This time is set as the default whenever calibration values are changed. The brew time can be extended to lengthen the water delivery time to meet a specific beverage taste profile. The table below list the data displayed and values available.

Data displayed	Screen Example	Values Available	Comment
Brew 1 Settings	b1	N/A	Displays briefly to indicate that the parameters are for brew button 1 (left)
Brew 1 Volume	64	Off, 30-128	Ounces. Button can be turned off and will serve as cancel only.
Brew 1 Time	3:30	Min-9:59	Calculated minimum to 9 minutes and 59 seconds.
Visa-brew 1 Time	0:30	0:00-4:00	Set to allow for beverage to finish dripping from basket after water delivery time has been completed.
Brew 2 Settings	b2	N/A	Displays briefly to indicate that the parameters are for brew button 2 (center)
Brew 2 Volume	64	Off, 30-128	Ounces. Button can be turned off and will serve as cancel only.
Brew 2 Time	3:30	Min-9:59	Calculated minimum to 9 minutes and 59 seconds.
Visa-brew 2 Time	0:30	0:00-4:00	Set to allow for beverage to finish dripping from basket after water delivery time has been completed.
Brew 3 Settings	b1	N/A	Displays briefly to indicate that the parameters are for brew button 3 (right)
Brew 3 Volume	64	Off, 30-128	Ounces. Button can be turned off and will serve as cancel only.
Brew 3 Time	3:30	Min-9:59	Calculated minimum to 9 minutes and 59 seconds.
Visa-brew 3 Time	0:30	0:00-4:00	Set to allow for beverage to finish dripping from basket after water delivery time has been completed.
Exit	End	N/A	Use left or right button when displayed to exit this mode.

OPERATION INSTRUCTIONS

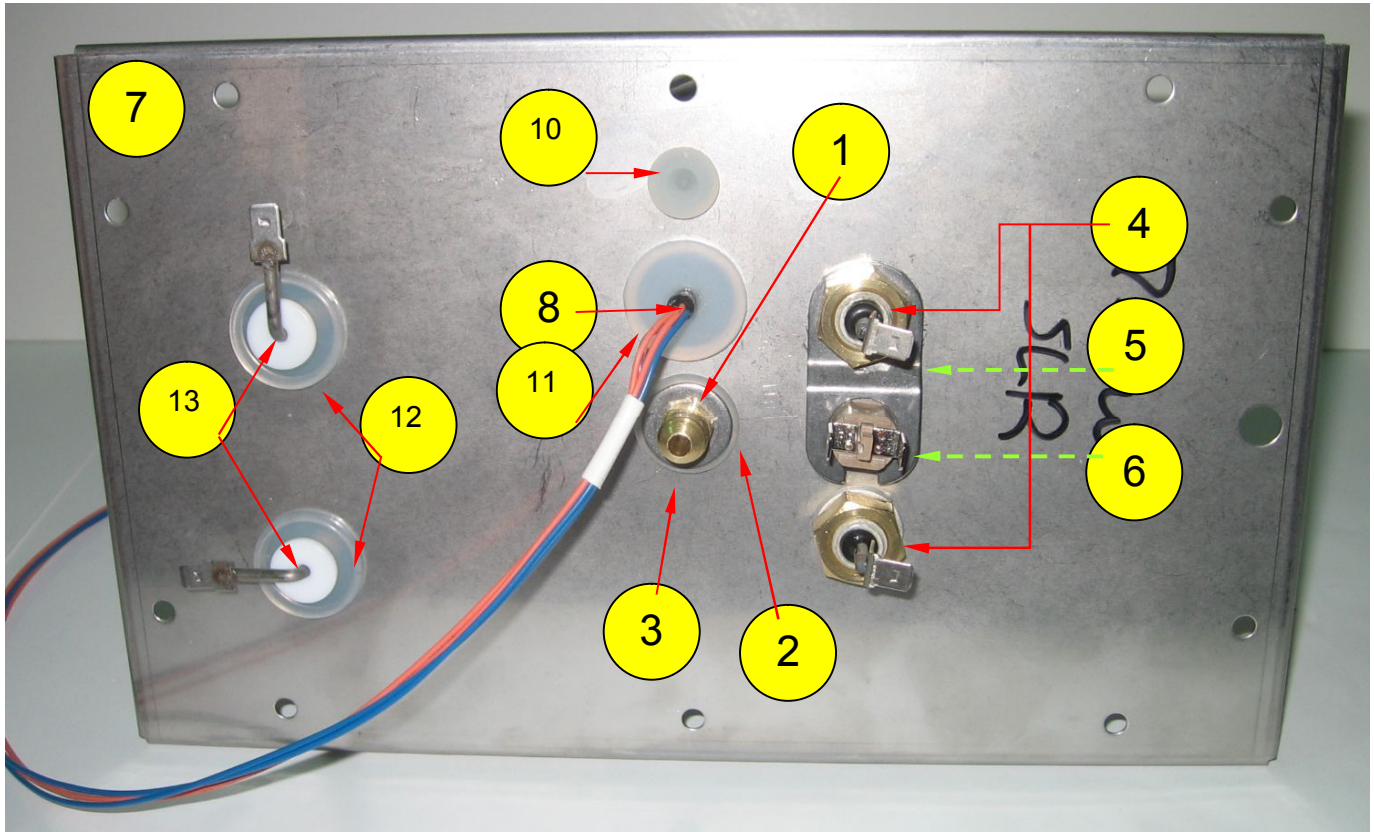
Coffee Preparation Procedures

- 1) Place filter into brew basket.
- 2) Put the proper amount of coffee into the filter.
- 3) Slide the brew basket into holder.
- 4) Place the appropriate empty decanter into position below the brew basket. For airports first open lid and remove pump stem unless of a brew through design. For other dispensers remove the lid unless it is a brew through design.
- 5) Press the appropriate brew start switch. Note: a brew cycle may be initiated even if the heating light is on. The brewer features an autoarm circuit which will flash the heating light indicating that the brewer is heating and will begin to brew immediately after the heating cycle is complete. To over ride autoarm, hold in brew button until cycle starts (5 seconds).
- 6) Do not remove decanter. Brew cycle may be canceled by depressing any brew button or the cancel switch on the front control panel.
- 7) Hot water will be delivered through the sprayhead. This distributes the hot water evenly over the coffee bed within the brew basket. The coffee brew will drain from the brew basket into the decanter below.
- 8) The Brewing light should continue to flash until all the liquid has finished flowing from the brew basket. Do not remove decanter until the brewing process has stopped and all liquid has stopped flowing from the brewbasket.
- 9) The resultant coffee brew should be crystal clear and have the desired properties attainable through excellent extraction.
- 10) To clean brew basket simply remove from brew rails and dump filter into waste basket. The brewing process, as described above, can now be started again.

Error Messages (Changed for firmware rev 9+)

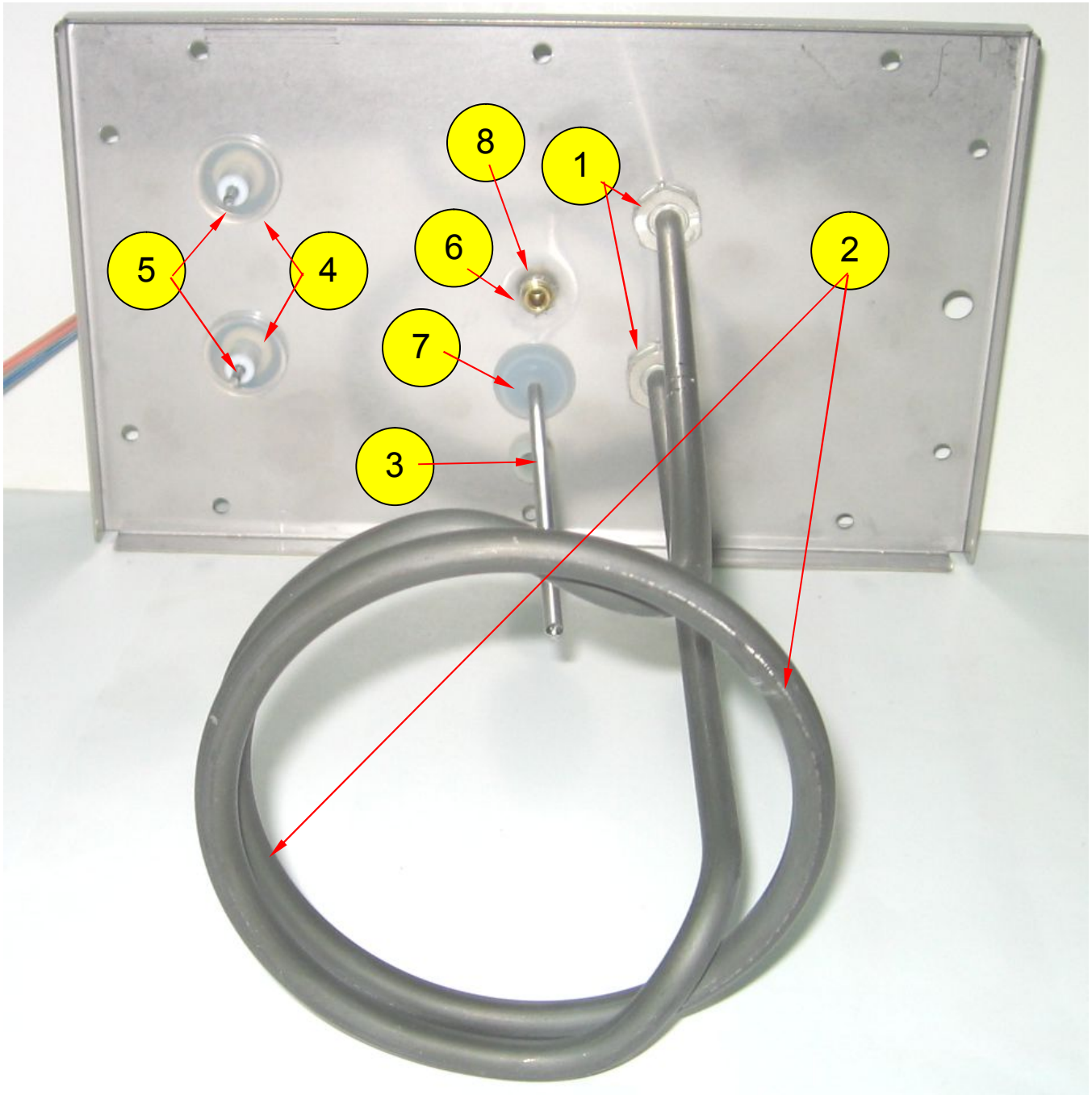
This brewer incorporates a number of self diagnostic test that are routinely run. If a fault condition should occur the unit will display an error number as outlined below. All errors may be reset by powering unit off and then back on. Errors E1 and E2 are auto-resttable and will clear themselves if the condition that caused them goes away. E3 will disable the heater but will allow a brew cycle to complete. The brewer will try to heat again when a brew cycle is started. E4 and E-A must have power to unit cycled to clear them. E5 will force brewer to use its default settings for brewing. E7 and E8 will clear when a brew cycle is started. E9 will disable input from dsplay board. If error repeats, correct the cause of the error.

Error Number	Description	Cause	What to Check
E1	Open Thermistor	Resistance extremely high from lower thermistor. Upper thermistor is also bad.	Check/replace thermistor.
E2	Shorted Thermistor	Resistance extremely low from lower thermistor. Upper thermistor is also bad.	Check/replace thermistor.
E3	Heater Run Error	Water did not heat within timeout period	Check element for short and for proper resistance. Check relay, hi-limit thermostat, and harness. Replace if bad.
E4	Tank Fill Error	Water did not reach probe in timeout period	Check valve function and flow rate. Replace valve or increase flow rate. Check probe(s) for excess scale.
E5	Comm Error	Serial communication error to/from non-volatile memory (EEPROM).	Replace main board.
E7	Open Motor Circuit	Open motor circuit. Pump 0 or pump 1.	Check harness/motor continuity. Replace if defective.
E8	Bad (Open) Motor Driver	Bad/open motor driver. Pump 0 or pump 1.	Replace main board.
E9	SPI Comm Error	Serial communication error to/from display board.	Verify good connection in proper port. Try new display board. Try new main board.
E-A	Possible Leak Detected	Water system may have a leak.	Check all plumbing system components for possible leak. Look for water on counter.
Full	Filter Full	Water filter has reached capacity.	Replace filter.

LID ASSEMBLY 120220

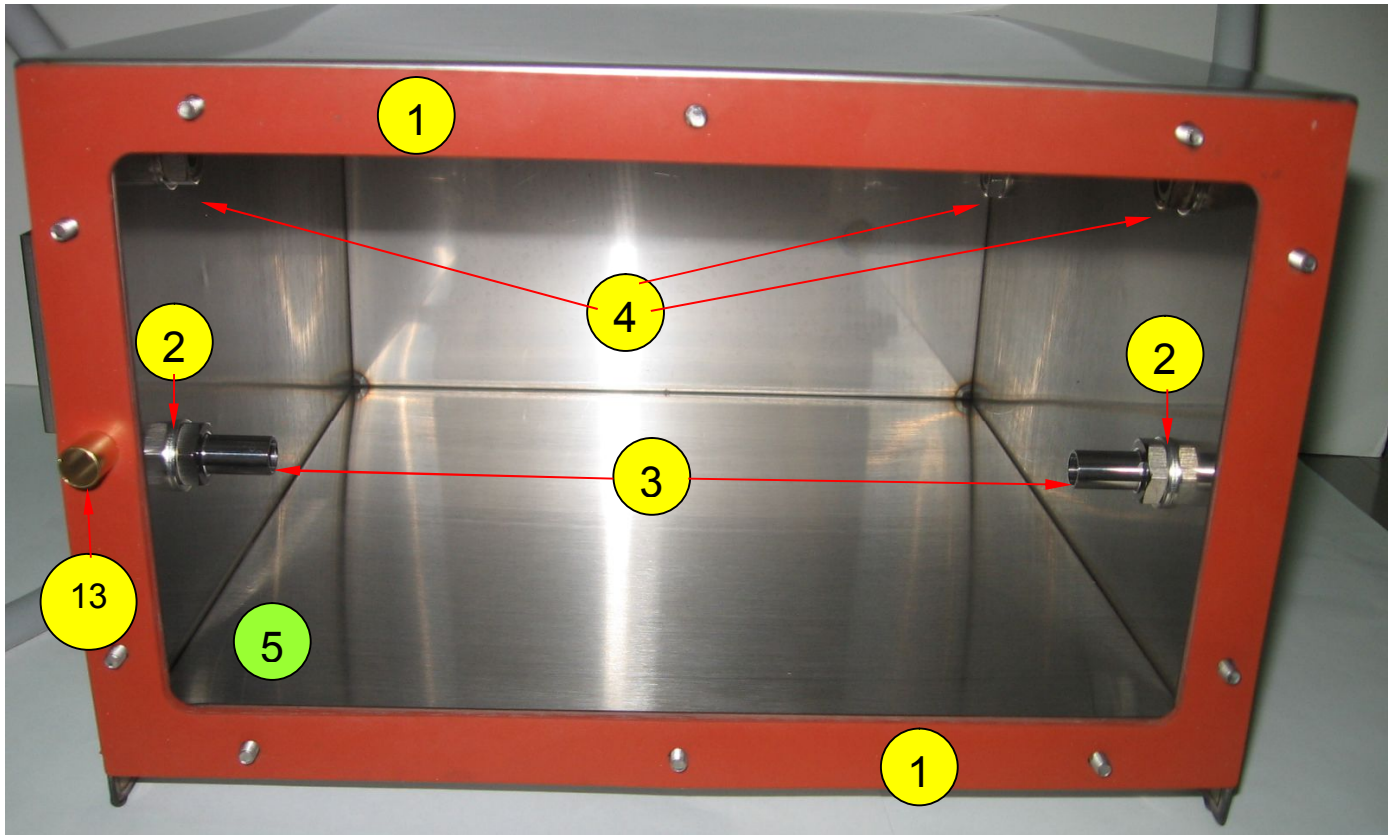
Item #	Part #	Description	Qty
1	04-0386	Washer, SS .451" ID x .750" OD	1
2	100025	Spray Head Gasket	1
3	100154	Male Connector, 1/4"F x 1/8"NPT	1
4	100190	Jam Nut, 1/2"-20 Brass	2
5	100269	Hi Limit Thermostat Bracket	1
6	111593	Hi Limit Thermostat, Vertical Tabs 221°F 25A	1
7	120221	Lid Punched, 20:1 Dual	1
8	151677	Temperature Probe, Dual 7.312"	1
9	152198	Lead Wire, Violet/Black 4" Teflon 1S-1S [Not Shown]	1
10	152207	Silicone Plug, Tank Cover Natural	1
11	500038	Silicone Grommet, .060" No Slit	1
12	500350	Silicone Grommet, Probe	2
13	500404	Probe Assembly, 1.45" 90°	2

LID ASSEMBLY 120220 – CONTINUED



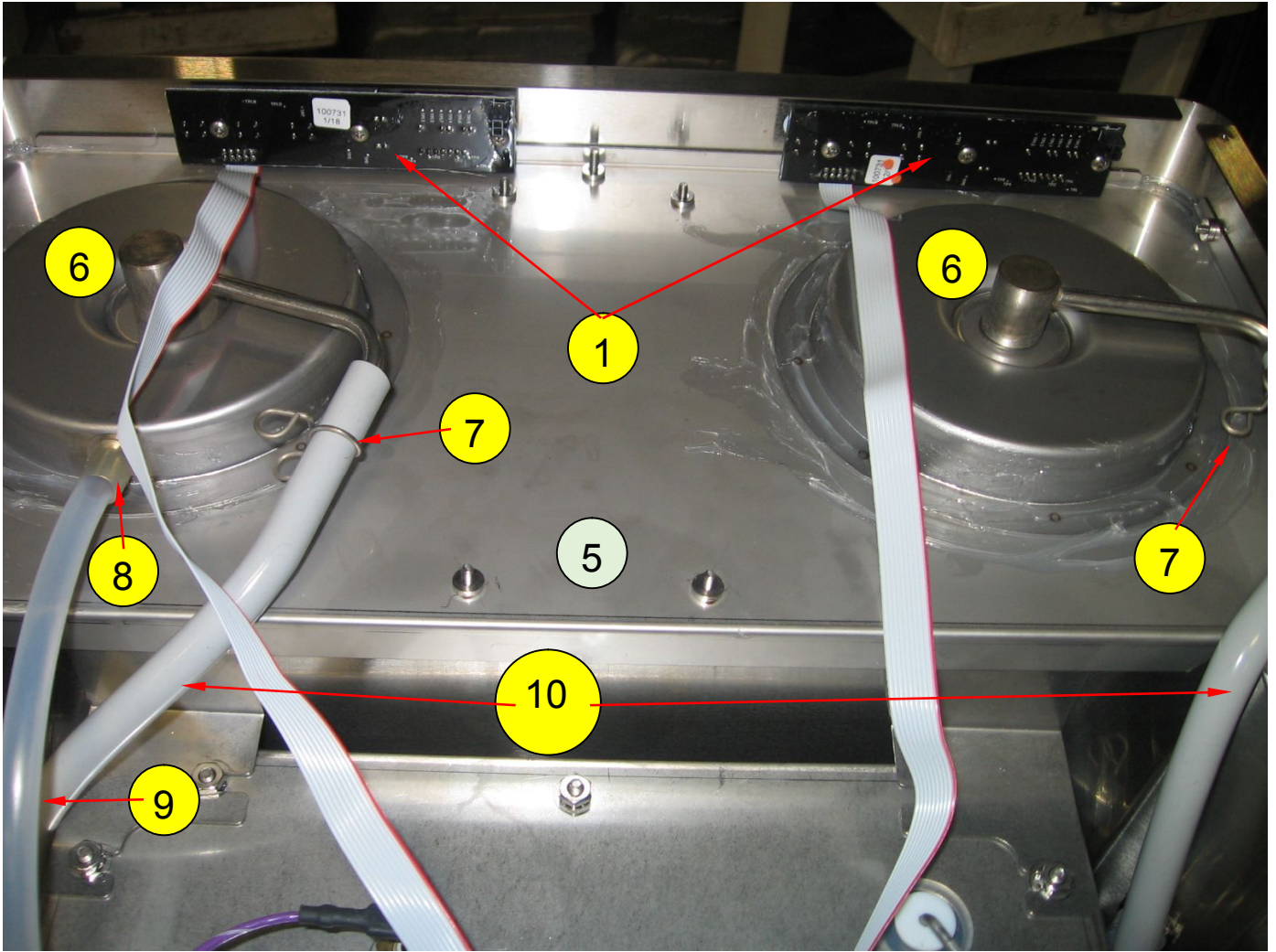
Item #	Part #	Description	Qty
1	100409	Gasket, Brass .520" ID Tin Plated	2
2	202025-10	Tank Element, 1750W 120V	1
3	151677	Temperature Probe, Dual 7.312"	1
4	500350	Silicone Grommet, Probe	2
5	500404	Probe Assembly, 1.45" 90°	2
6	100154	Male Connector, 1/4"F x 1/8"NPT	1
7	500038	Silicone Grommet, .060" No Slit	1
8	100025	Spray Head Gasket	1

TANK ASSEMBLY WITH FITTINGS 121796



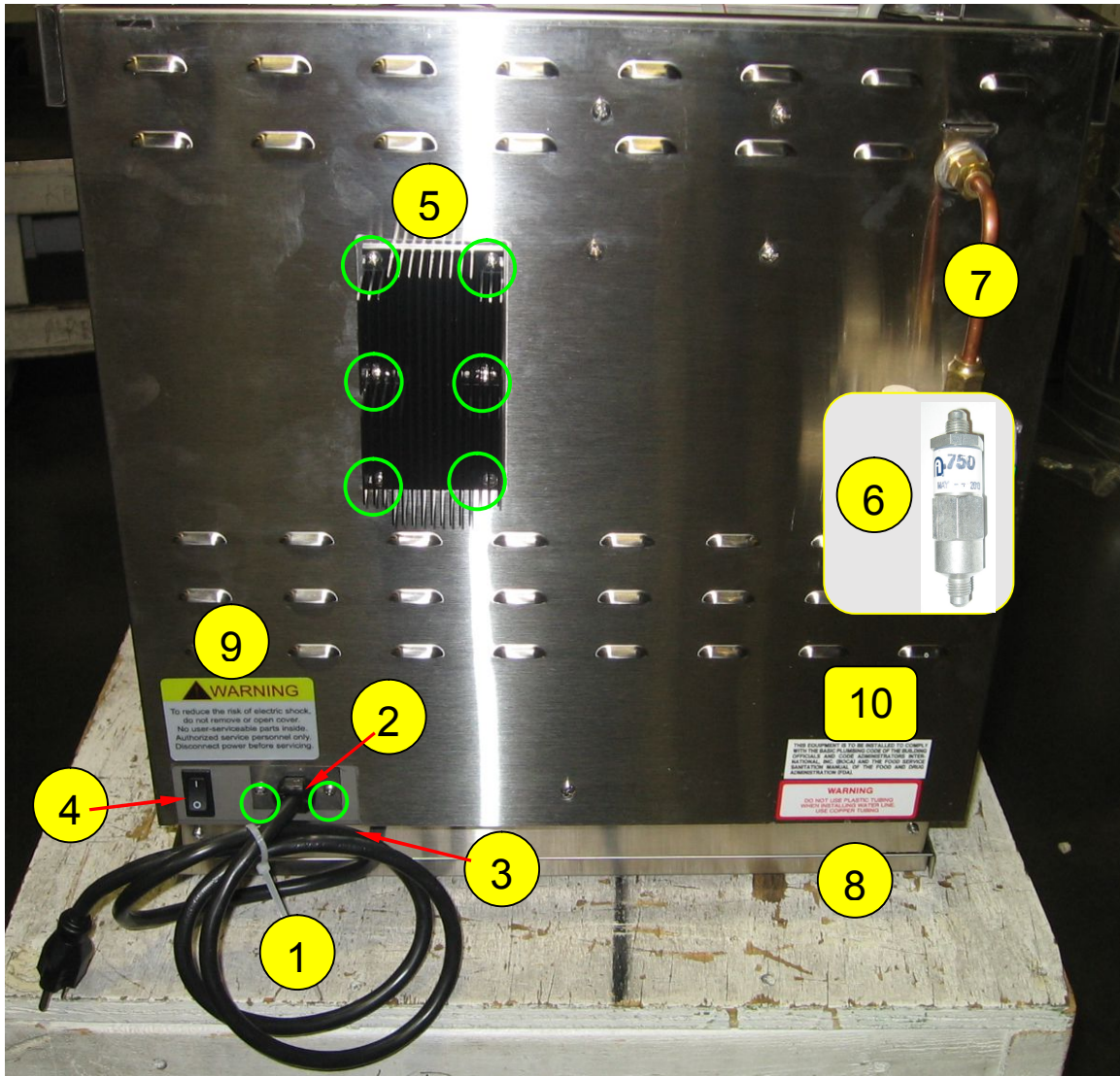
Item #	Part #	Description	Qty
1	120222	Tank Gasket, 20:1 Dual bBrewer	1
2	100030	Brass Gasket .566" ID Tin Plated	10
3	100733	Bulk Head Fitting, Outlet with Extension	2
4	102835	Bulk Head Fitting, Outlet Tin Plated	3
5	121796	Tank Only, Spot Welded	1
6	701983	Silicone Tubing, 3/8" x 5/8" x 8.00" [Overflow Tube] [Not Shown]	1
7	100408	Plug, 3/8" Barbed Tubing, PP [Not shown]	1
8	100431	Brass Nut, 9/16"-24 x 11/16" Hex Tin Plated [Not Shown]	5
9	111635	Hose Clamp, .574" ID [Not Shown]	4
10	701646	Hose Clamp, Plastic [Drain Hose] (Not Shown)	1
11	701702	Silicone Tubing, 3/8" ID x 5/8" OD x 32.00" [Drain Hose] (Not Shown)	1
12	781188	Silicone Tubing, 3/8" x 5/8" OD x 2.25" [Not Shown]	2
13	201275	Brass Insert, 3/8" [1/2" Tube]	1

DISPLAY BOARD [100731] AND BREW PLATE [121775]



Item #	Part #	Description	Qty
1	100731	Display Board & Harness*	2
2	120025	Spacer, 6-32 x 3/8" Hex x 7/16" L*	6
3	120046	Screw, 6-32 x 1/4" PPHMS Poly*	6
4	110941	Washer, Nylon .151"x .345" x .031"	6
5	121775	Brew Plate Spot Welded, Dual 20:1	1
6	119843	Spray Head Tube Assy. NB Tall	2
7	111635	Hose Calmp. .574" ID	2
8	201275	Brass Insert, 3/8" [1/2" Tube]	1
9	701983	Silicone Tubing, 3/8" ID x 5/8" OD x 8.0" [Over Flow Tube]	1
10	123061	Silicone Tubing, 1/4" x 1/2" x 18.0" [Raw Number is 111240]	2
* Parts Associated with the Display & Harness Part # 100731			

Component Panel 121787



Item #	Part #	Description	Qty
1	100022	Cord, Power	1
2	101035	Grommet, Strain Relief	1
3	101898	Cord Plate	1
4	110626	Switch, DP/ST Rentangular Rocker	1
5	121659	Heatsink	1
6	101750	Folw Assembly Flare to Flare .750GPM	1
7	704210	Copper Tube, 1/4" OD x .030" x 1.31" x 2.75" 90°	1
8	100817	Label, Warning "Precaution"	1
9	100821	Label, WarningG "Electrical Shock"	1
10	101012	Label, Plumbing Instructios	1
11	105043	Screw with Washer, 6-32 x 3/8" SS	8

MISCELLANEOUS COMPONENTS

Part #	Image	Description	Qty
119995		VALVE ASSEMBLY, NB KIP	1
100154		MALE CONNECTOR, 1/4" F x 1/8" NPT	1
100255		KIP VALVE, SOLENOID	1
100395		MALE CONNECTOR, 1/4" F x 1/8" NPT	1
104225		SCREW, WITH WASHER 10-32 X 1/4" PPHMS SS	2
101527		REPLACEMENT KIT, KIP VALVE	1

MISCELLANEOUS COMPONENTS - CONTINUED

Part #	Image	Description	Qty
119983		SOLENOID VALVE BRACKET, NB	1
511023		BRASS NUT, 7/16"-20 x 11/16" HEX	1
511046		WASHER, SS 7/6: INTERNAL TOOTH	1
121780		<i>GEAR PUMP ASSEMBLY, DUAL 20:1 LH</i>	1
109937		GEAR PUMP ASSEMBLY	1
100054		WASHER, #8 EXTERNAL LOCK SS	2

MISCELLANEOUS COMPONENTS - CONTINUED

Part #	Image	Description	Qty
100061		8-32 Hex Nut, SS	2
100191		6-32 Hex Nut, SS	2
119805		Gray Silicone Tube, 7.5" [Gear Pump to Tank]	1
121781		Gear Pump Bracket, 20:1 Dual LH	1
152164		Washer, .218" ID x .562" OD SS	2
152225		4" Nylon Tie Wrap	2





MISCELLANEOUS COMPONENTS - CONTINUED

Part #	Image	Description	Qty
110367-10		Relay 50 AMP, Solid State	1
100729		Main Bord	1
102844		Supprt, Circuit Board 3/8"	4
105115		Tranformer	1
110885		Faucet, Lift Up Handle	1
110985		Brew Basket, BW Mod. Vac. Black	1

MISCELLANEOUS COMPONENTS - CONTINUED

Part #	Image	Description	Qty
111634		Hose Clamp, .459" ID [Pump to Spray Head]	2
121777		Outer Rail, RH 20:1 DLD 2LT	1
121778		Outer Rail, LH DLD 2LT	1
201173		Spray Head Nut	2
201208		Round Spray Head, Dump Drill .086"	2
700021		Knurled Nuts, 8-32 Brass	6

MISCELLANEOUS COMPONENTS - CONTINUED

Part #	Image	Description	Qty
121795		Bracket, Gear Pump Dual 20:1 RH	1
120230		Brew Rail, Left Center 20:1 Dual	1
120231		Brew Rail, Right Center 20:1 Dual	1
121782		Base Rail, 20:1 Dual 8.07"	4

20:1 Dual Wiring Diagram

