

20:1 Coffee/Tea Brewer Operation and Service Manual



Model 20:1-AP shown.
Airpot not included.

Basic Model Table

Model	Height	Width	Depth	US 120 V	Canada 120 V	240 V
20:1-LD	17.8	8.5	19.8	1750W 14.6A	1400W 11.7A	3500W 14.6A
20:1-AP	19.3	8.5	19.8	1750W 14.6A	1400W 11.7A	3500W 14.6A
20:1-TD	24.2	8.5	19.8	1750W 14.6A	1400W 11.7A	3500W 14.6A
20:1-LP3	17.3	15.5	18.4	1700W 14.2A	1400W 11.7A	3800W 17.1
20:1-AP (Pro model)	18	8.8	18.8	1750W 14.6A	1400W 11.7A	3500W 14.6A
Thermal Models Dual Voltage	See Above	See Above	See Above	1750W 14.6A	1400W 11.7A	3150W 13.1A

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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 PSI. 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) Manufacturer strongly recommends use of a water filter to reduce scale and sediment as well as to provide for a better tasting beverage. Connect water line from filter to the flow control attached to the flared fitting extending from the back of the brewer. Manufacturer recommends connecting to copper tubing.
- 5) 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.

UNITS WITH COLD WATER DILUTION OPTION – Combo models incorporate a dual valve for preparation of iced tea, lemonade, iced coffee or other beverages. This valve should be primed during setup by running a cold water calibration cycle as outlined in programming. Alternatively, priming may be accomplished by running a recipe, such as iced tea, that utilizes the cold water valve.

Voltage Convertible Models – Some brewer models may be constructed to allow connection to either 120 V or 240 V ac single phase circuits. The brewers rating plate will reflect the current voltage the unit is configured for. To convert to the alternate voltage, see conversion instructions at the end of this manual.

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

Programming - 121753 firmware

The 20:1 Brewer may be ordered as a standard coffee brewer or as a “combo” brewer capable of brewing both coffee and iced tea beverages. The combo brewer incorporates a 2nd water valve to deliver the cold water dilution to mix with the brewed tea concentrate. Brewers with r2 and higher firmware come standard with a mechanical heater relay. A solid state relay may be specified as an alternate at an additional cost. The new main control board (part no 121753) includes a couple of additional programming steps compared to previous control versions (part no 100729) to accommodate these options. The tables on the next couple of pages have the new programming steps **highlighted** as an aid to those familiar with the previous programming procedures.

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 pages will outline the various steps as displayed by the programming “screens”. The screens will loop continuously until exiting the mode.

20:1 INSTALLATION / SETUP INSTRUCTIONS

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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. For coffee only brewers (no 2nd valve) ignore the dilution calibration and cold calibration volume. Use the center button to advance through those items.

Item Selected	Screen Example	Values Available	Comment
Water Temperature	200	170-205	Degrees F
Pulse Heating New in version 2 of 121753 control board	Off	On, OFF	Must be OFF for mechanical relay. May be on or off for solid state relay, on is preferred. If brewer has a heat sink on the back, this indicates it has a solid state relay for tank heater.
End of Cycle Beeper	On	On, OFF	Uses a series of beeps to audibly indicate brew cycle has completed.
Brew Pump Speed	b:05	1-10	Pump speed used for brewing
Not Used	F:05	2-10	No effect. Unused feature.
Pump Calibration	CAL	N/A	See instructions below. Must be done if pump speed modified.
Hot Calibration Vol	39.0	25.0-99.9	Ounces. Only displays if calibration cycle was run.
Dilution Calibration	CLd	N/A	Press left or right button to run dilution valve calibration.
Cold Calibration Vol	24	20-150	Ounces delivered during cold water dilution.
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	OFF, 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:

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.

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Warranty will be void if machine is connected to any voltage other than that specified on the name plate.

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.

Data Displayed	Screen Example	Available Range	Comment
Lower Temperature	198	N/A	Degrees F, OPn, SHr, - - -*
Upper Temperature	20:0	N/A	Degrees F, OPn, SHr, - - -*
Probes	1:L	L	Displays L for liquid level if probes are in contact with the water.
Exit	End	N/A	Use left or right button when displayed to exit this mode.

***Note:** (- - -) Three dashes indicates that the reported thermistor temperature value is outside the display range (100°F – 215°F.)

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 one 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 volumes, brew time, and visa-brew time can be programmed for each of the three buttons on the face of the brewer. The brew volume may all be run through the basket or a portion of the total volume may be added to the brewed concentrate as cold water dilution. 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. **For coffee only machines, brew total and brew concentrate should match.** The table below list the data displayed and values available.

Data displayed	Screen Example	Available Range	Comment
BREW 1 SETTINGS	b1	N/A	Displays briefly to indicate that parameters are for Brew Button 1 (left)
Brew 1 Total Brew Volume	64	Off, 30-128	Ounces. Button can be turned off and will serve as cancel only.
Brew 1 Concentrate Volume	64	30-Total Brew Volume	Program the volume of the total volume that should be delivered as hot water through basket. Total - Conc = Cold Dilution.
Brew 1 Time	3:30	Min-9:59	Calculated minimum to 9 minutes and 59 seconds.
Brew 1 Delay	0:05	0-2:00	Delay between end of hot water delivery and start of cold water. Only displays if Conc Volume < Total Volume and is > 0
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 parameters are for Brew Button 2 (center)
Brew 2 Total Brew Volume	64	Off, 30-128	Ounces. Button can be turned off and will serve as cancel only.
Brew 2 Concentrate Volume	64	30-Total Brew Volume	Program the volume of the total volume that should be delivered as hot water through basket. Total - Conc = Cold Dilution.
Brew 2 Time	3:30	Min-9:59	Calculated minimum to 9 minutes and 59 seconds.
Brew 2 Delay	0:05	0-2:00	Delay between end of hot water delivery and start of cold water. Only displays if Conc Volume < Total Volume and is > 0
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	B3	N/A	Displays briefly to indicate that parameters are for Brew Button 3 (right)
Brew 3 Total Brew Volume	84	Off, 30-128	Ounces. Button can be turned off and will serve as cancel only.
Brew 3 Concentrate Volume	42	30-Total Brew Volume	Program the volume of the total volume that should be delivered as hot water through basket. Total - Conc = Cold Dilution.
Brew 3 Time	3:30	Min-9:59	Calculated minimum to 9 minutes and 59 seconds.
Brew 3 Delay	0:05	0-2:00	Delay between end of hot water delivery and start of cold water. Only displays if Conc Volume < Total Volume and is > 0
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 / Tea Preparation Procedures

1. Place filter into brew basket.
2. Put the proper amount of coffee or tea into the filter. Filter not required for filter pack coffee/tea.
3. Slide the brew basket into holder.
4. Place the appropriate empty decanter into position below the brew basket. For airpots 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 override autoarm, hold in brew button until cycle starts (5 seconds).
6. **Do not remove decanter!** Brew cycle may be canceled by pressing any brew button or the cancel switch on 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 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

This brewer incorporates a number of self diagnostic tests 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.

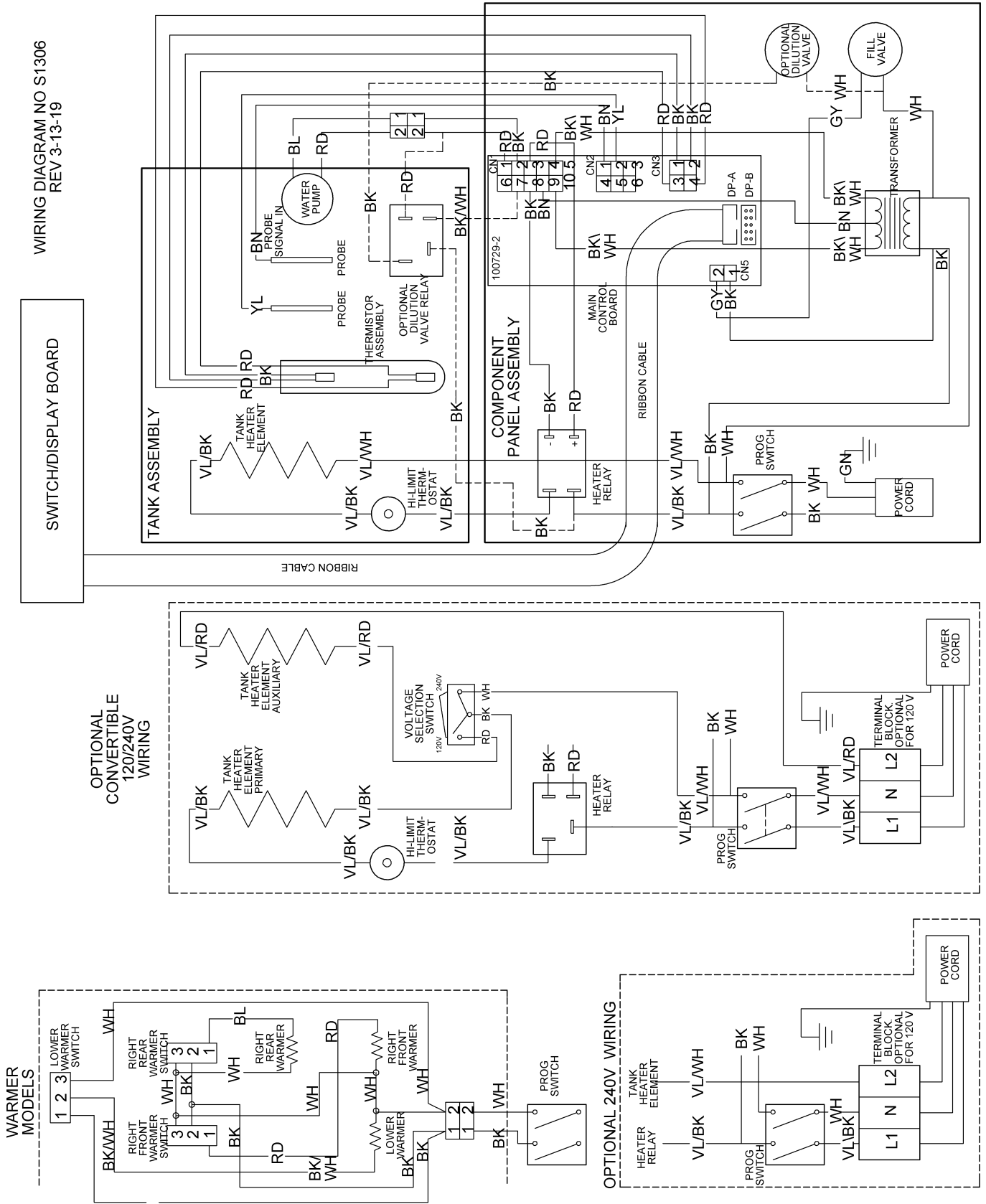
- **E1 & E2** are auto-resetable and will clear themselves if the condition that caused them goes away.
- **E3** will disable the heater but will allow a brew cycle to complete. The brewer will try to heat again when a brew cycle is started.
- **E4 & E-A** must have power to unit cycled to clear them.
- **E5** will force brewer to use its default settings for brewing.
- **E7 & E8** will clear when a brew cycle is started.
- **E9** will disable input from display board. If error repeats, correct the cause of the error.

Error #	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 faulty component.
E4	Tank Fill Error	Water did not reach probe within timeout period. (Initial fill: 4 mins) (Normal Operation: 1.5 mins)	Check valve function / 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. Check display board and main board. Replace faulty component.
E-A	Leak Detected	Water system may have a leak.	Check all plumbing system components for possible leak. Look for water on counter / surrounding area.
Full	Filter Full	Water filter has reached capacity.	Replace filter.

Replacement Parts

Electrical Components		Flow Controls	
121753	Board, main control	101350	Flow regulator, diaphragm type, .35
100731	Display board, red LED	100298	Flow washer, .35 GPM
121478	Display board, blue LED	330538	Flow regulator, SPDS adjustable, low
119754	Display board, blue LED, short (short head models only)		
105115	Transformer, 120V primary, 24 VCT 40VA	Baskets / Servers	
110626	Switch, DPST, black rocker	110985	Brewbasket, black coffee (Uses standard rails 102799/102800)
100085	Switch, SPST, lighted rocker	110856	Brewbasket, clear tea (Uses standard rails 102799/102800)
702355	Switch, DPDT, on-on, 20/15A (dual voltage switch)	119746	Brewbasket, SS, narrow, no by-pass, anti drip (Special rails required, 104010/11)
110958	Relay, Mechanical, 12VDC, SPST, 30A	121752	Pitcher, ice tube, 3.3 liter tea
110367-10	Relay, 50A, Solid State (Brewer must have heat sink)	109115	Thermal Carafe, S/S, 1.9l
202025	Element, tank 120V 1750W	112005	Short gravity dispenser w/sight gauge, 2.5l
701170	Element, tank 120V 1400W	112006	Tall gravity dispenser w/sight gauge, 2.5l
202057	Element, tank 120V 1100W	112017	Jumbo stand, for gravity dispensers above
202027	Element, tank 240V 3500W	121282	Airpot, 2.2l w/sight gauge
121350	Element, tank 120V 1400W (dual voltage models)	120818	Airpot, 2.2l
111593	Thermostat, hi-limit, 221F, 25A	Many others available. Visit https://www.newcocooffee.com/accessories/	
100269	Bracket, hi-limit thermostat	Tubing & Seals	
100010	Warmer plate assy, 120V 100W, black	110885	Faucet assy, lift up handle
100187	Warmer element, 120V 100W	803131	Hose, reinforced silicone, 1/4 ID X .52 OD
151677	Thermistor probe, dual temp 7.312	111240	Hose, grey silicone, 1/4 ID X 1/2 OD
119804	Gear pump and bracket assembly	119843	Sprayhead tube assy, internal
109937	Pump only, gear water	119741	Sprayhead tube assy, internal (short head models)
100255	Valve assy, solenoid (coffee only models)	201173	Nut, sprayhead, 7/16-20 S/S
119771	Dual valve assembly (combo models)	201208	Sprayhead, RD dump, .086 drill
500404	Probe assy, liquid level, 90 deg, 1.45"	152207	Plug, tank silicone
		500038	Grommet, silicone, thermistor, .06 hole
Labels		500350	Grommet, silicone, probe, .31 hole
119978	Label, faceplate, red window		
121479	Label, faceplate, blue window		
119739	Label, faceplate, blue window, short (short head models only)	Miscellaneous	
401361	Label, combo faceplate "Regular Bold Tea"	100665	Foot, rubber push-in, plastic base
119996	Label set, button, round icons	100078	Foot, screw in, metal base
100254	Decal, Hot Surfaces warning	119752	Dilution tube (optional gourmet S/S brewbasket for center dilution models)
		119753	Dilution tube (standard black plastic brewbasket for center dilution models)
		119784	Drop down shelf for short carafe kit (optional, fit is limited to select models only)

Wiring Diagram



20:1 Series Brewers with Voltage Convertible Option

Field Conversion Instructions

Some 20:1 series brewers may be optionally constructed at the factory so as to allow easy conversion in the field from 120 VAC operation to 120/240 VAC operation, and vice-versa. Units originally rated 120 VAC, and intended for possible field conversion to 120/240 VAC operation will be provided with: Two heater elements in the hot water tank assembly, a 240 V terminal block, and an internal DT switch used to route power to either one or both tank elements. Only one of the heaters ("primary" heater) is powered for 120 VAC operation and both elements, in series, are powered for 240 V ac operation. For units marked as CUL, the primary heater is rated 1400 W, 120 VAC. For units marked as UL only, the primary heater may be rated either 1400 W or 1750 W, 120 VAC. Field conversion instructions are included in installation and operation manual for the dual voltage units. Conversion consist of changing the power cord or field wiring to correspond with circuit, and then turning the internal switch, located adjacent to the terminal block, to the appropriate position corresponding to the circuit used to power the unit. The label adjacent to the internal switch indicates correct position for each voltage option. If 240V is selected when wired to a 120V circuit, an open heating circuit results.

ALL REPAIRS MUST BE DONE BY A QUALIFIED TECHNICIAN IN COMPLIANCE WITH NATIONAL, LOCAL AND ALL OTHER APPLICABLE REGULATORY STANDARDS.

KIT PART NUMBERS AND COMPONENTS

20:1 BREWER KIT, CONVERT 120V TO 240V
Kit PN: 119787

Part #	Description
511054	CONNECTOR, CABLE 3/4"
119788	LABL, CONV, 3150 W, 20:1
*152545	CORD ASY, 10/4, 240V, L14-20 (Optional component)

20:1 BREWER KIT, CONVERT 240V TO 120V
Kit PN: 119789

Part #	Description
119792	CORD/PLATE ASY, CONV, 20:1
119790	LABL, CONV, 1400 W, 20:1, CAN
119791	LABL, CONV, 1750 W, 20:1, USA

WARNING: The brewer must be disconnected from the power source before proceeding with conversion!

Converting 120V to 240V Operation

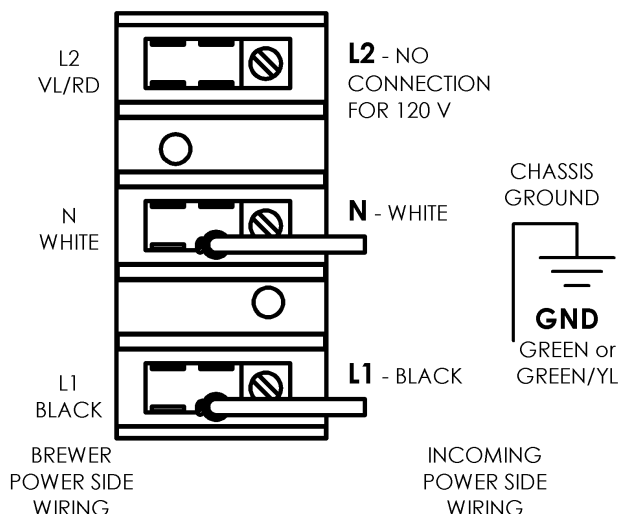
1. Obtain the required conversion kit (**Kit PN: 119787**)
2. Turn off switch on rear of brewer and allow unit to cool.
3. Disconnect brewer from electrical circuit and shut off water supply.
4. Remove strainer/flow control and elbow tube assembly from the plumbing inlet on rear of brewer.
5. Remove brewer top cover then remove back panel.
6. **Do not disturb any internal brewer wiring except as noted.** Remove the power cord terminals from the terminal block at positions noted as L1 and N.
7. Remove the screw and washer securing the power cord ground lug and retain hardware for re-use.
8. Remove the 2 screws securing the power cord and plate assembly and then remove power cord from brewer.
9. Install the strain relief/cable connector from the kit into the mating electrical supply hole exposed by cord removal and tighten securely.
10. Feed the cord through the strain relief ensuring that adequate length is inside the compartment to make connections to ground and terminal block. Snug the screws on the strain relief to hold in place while making connections.
11. Turn screws on the face of the 3 lugs on the terminal block CCW to open a gap below allowing for conductor installation.
12. Note the terminal block connection (*diagram below*) illustrates correct incoming power connection for both 120V and 240V options. Connect the green conductor to the ground connection point and the 3 remaining conductors to the appropriate position on the terminal block. Feed the cord leads into the openings in the lugs created in the previous step and then securely tighten the lug screws to hold the conductors in place. If conductors on cord have fast-on terminals, connect them directly to the open tab terminals on the appropriate lug as noted in diagram.
13. Firmly tighten the screws on the cord strain relief to secure cord in place.
14. Flip the internal voltage selection switch, located above the terminal block, to 240 V position as indicated on the label adjacent to switch. This will allow both elements to be powered in series by 240 V.
15. Place the new electrical ratings decal from the kit over the existing ratings label with serial number.
16. Replace back panel and top cover.
17. Reconnect strainer/flow control and water line and turn on water supply.
18. Plug in/connect brewer to proper electrical circuit and turn on power switch on rear of brewer.

20:1 Series Brewers with Voltage Convertible Option

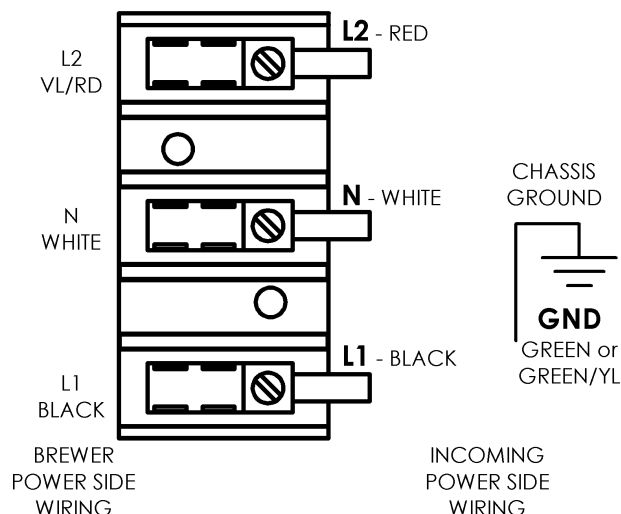
Field Conversion Instructions

Single Phase Wiring Diagrams

120 V TERMINAL BLOCK CONNECTION DIAGRAM



240 V TERMINAL BLOCK CONNECTION DIAGRAM



Converting 240V to 120V Operation

1. Obtain the required conversion kit (**Kit PN: 119789**).
2. Turn off switch on rear of brewer and allow unit to cool.
3. Disconnect brewer from electrical circuit. Turn off water supply.
4. Remove strainer/flow control and elbow tube assembly from plumbing inlet on rear of brewer.
5. Remove brewer top cover then remove back panel.
6. Do not disturb any internal brewer wiring except as noted. Remove the incoming power terminals from the terminal block at positions noted as L1, N and L2.
7. Remove the screw and washer securing the power cord ground lug and retain hardware for re-use.
8. Remove the power cord from brewer.
9. Remove the strain relief/cable connector from brewer.
10. Install the power cord and plate assembly from the kit into the mating electrical supply hole exposed by strain relief removal. Secure the cord/plate assembly using the 2 screws in the kit. 2 holes in plate align with holes in the brewer. Tighten securely.
11. Note the terminal block connection diagram, above, illustrates the correct incoming power connection for both 120 and 240 V options. Connect the green conductor to the ground connection point and the 2 remaining conductors to the appropriate position on the terminal block. Conductors on cord have fast-on terminals. Connect them directly to the open tab terminals on the appropriate lug as noted in diagram.
12. Flip the internal voltage selection switch, located above the terminal block, to 120 V position as indicated on the label adjacent to switch. This will allow just the primary tank element to be powered. For CUL approved brewers, the primary element connected is rated at 1400 W. For UL approved brewers, the primary element connected is rated at 1750 W. If the switch is left in the 240 V position, neither element will be powered as the tank circuit will be open.
13. Place the new electrical ratings decal from the kit over the existing ratings label with serial number.
14. Replace back panel and top cover.
15. Reconnect strainer/flow control and water line and turn on water supply.
16. Plug in/connect brewer to proper electrical circuit and turn on power switch on rear of brewer.

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.

