

Shuttle Brewer & Airpot/Shuttle Brewers

Operation and Instruction Manual

For Models P300E, P400E, P400ESHP, RAP300E,
RAP400E, RAPS300E, RAPS400E

| Table of Contents | |
|--------------------------------------|-------|
| Installation and Start-up | 1-2 |
| Warning Labels | 3 |
| Operation | 4 |
| Adjustments | 5-8 |
| Care and Cleaning | 9-10 |
| Service | 10-11 |
| Troubleshooting | |
| Filling Problems | 12 |
| Heating Problems | 13 |
| Brewing Problems | 14 |
| Parts Illustrations | |
| Models P300E & P400E | 15 |
| Model P400ESHP | 16 |
| Model RAP400E | 17 |
| Model RAPS400E | 18 |
| VSB-400..... | 19 |
| Shuttle CS-LL | 20 |
| Rough-In Drawings | |
| Model P300..... | 21 |
| Model P400 & P400ESHP | 22 |
| Model RAP300 | 23 |
| Model RAP400 | 24 |
| Model RAPS300 | 25 |
| Model RAPS400 | 26 |
| VSB-300 | 27 |
| VSB-400 | 28 |
| Wiring Diagrams | |
| P300E/P400E with 1 Batch Timer | 29 |
| P300E/P400E with 2 Batch Timer..... | 30 |
| RAP300E/RAP400E..... | 31 |
| RAPS300E/RAPS400E..... | 32 |
| P400ESHP | 33 |
| Drawing #091-548 | 34 |
| Drawing #091-182 | 35 |

Installation:

 **WARNING**

ELECTRIC SHOCK HAZARD!

Installation of this appliance should be performed by qualified service personnel only. Improper installation could result in electrocution.

See rough-in drawings in this manual for dimensions and locations of electric and water input.

Set-Up/Position

- 1) Remove the brewer from the packing material and attach its legs.
- 2) Position the brewer on a strong, stable table or counter. Check the level front to back and side to side. Adjust the legs to the correct level.

IMPORTANT:

THE PERSON INSTALLING THIS APPLIANCE IS RESPONSIBLE FOR ENSURING THAT ELECTRIC AND WATER CONNECTIONS MEET THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE, NATIONAL PLUMBING CODE, AND ANY LOCAL ORDINANCES.

The electric and water hook-up locations are behind the front panel. Remove the four screws fastening this panel for access to these connections.

Water Hook-up

- 1) The water line may enter through holes on the rear or the bottom of the brewer. Use the right hand opening for water.
- 2) Use 3/8" copper or flexible water line to prevent strain. Do not use low temperature plastic tubing. The connection to the fill valve is 3/8" flare.
- 3) Water line pressure must be from 30 to 70 psi.
- 4) Hot (up to 160°F) or cold water may be used. Hot water offers faster recovery between brews.
- 5) Install a shut-off valve near the brewer.
- 6) Installing a filtering system can improve the taste of brewed coffee and extend the life of the brewer. If your water has high calcium (lime), chlorine, or iron content, this is especially important. The filter should be the lime inhibiting type if cold water is used. Contact your local water treatment professional regarding the type of filter you should use based on water quality and volume of water used.

Prior authorization must be obtained from Grindmaster Corporation for all warranty claims.



GRINDMASTER™
CORPORATION

Grindmaster Corporation

4003 Collins Lane
Louisville, KY 40245 USA
(502) 425-4776
(800) 695-4500 (USA & Canada only)
(800) 568-5715 (Technical Service Only)
FAX (502) 425-4664
www.grindmaster.com

Installation (con't)

Electric Hook-up

- 1) The electric ratings for your brewer are printed on its nameplate. Typical electric ratings are:

P300, P400, RAP300, RAP400

Optional 120/208V, 3.8kW, 18A or 120/240V 5.0kW, 21A, 1 phase

Standard 120/208V, 5.0kW, 24A or 120/240V 6.6kW, 28A, 1 phase

RAPS300, RAPS400

Standard 120/208V, 4.4KW, 21A or 120/240V, 5.6KW 24A, 1 phase

P400ESHP

Standard 440V, 12.5KW, 16.3A, 3 phase WYE

If the brewer includes the three heater tank option C21A, the ratings will be different. Always see the nameplate for correct ratings.

- 2) The brewer should be connected to its own circuit with a fused disconnect switch or a circuit breaker near the brewer.
- 3) Attach the appropriately sized cord to the brewer with a cord grip for the 1 1/2" electric input opening. The cord may enter through the rear or bottom on the left side of the brewer. Use an oil resistant cord such as type SO, SOO, SAO, STOO, SEO, SJO, SJOO, SJTO, SJTOO, SJEO, HSO, HSOO, HSJO, or HSJOO. Alternatively, flexible conduit and type THHN wires may be used. Use only copper conductors.
- 4) Standard connection is 1 phase 3 wire. Connect the two lines to L1 and L2 on the terminal block. If the brewer is wired for three phase, a lug, L3, is provided on the terminal block. A neutral line must be connected to the N terminal.



Never use the ground conductor as a neutral. This could cause electrocution.

- 5) The body of the brewer must be grounded. A ground lug is provided for this purpose.

Start-up

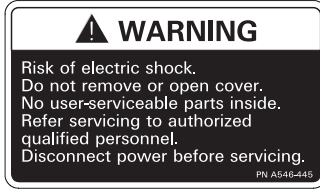
- 1) Turn on the water supply to the brewer. Check for leaks.
- 2) Turn on the electric supply. The brewer will begin to fill.
- 3) Replace the front access panel.
- 4) Once the brewer is full, it will take 15 to 35 minutes to heat. The water hot light will turn on when up to temperature.
- 5) Insert the brew baskets and place a shuttle or airpot under the baskets. Brew at least one batch from each side. Check the level in the container to be sure the brew volume is correct. Remember that when using coffee, the level will be lower. Do this for both batch sizes when provided. The water must be hot to check the levels. If adjustments are needed, see the adjustments section of this manual.

Warning Labels

The following warning labels were on your dispenser when it was shipped from the factory. They should remain on your dispenser in good, readable condition at all times. If one of your labels is missing or damaged, order a replacement label immediately.

Part # A546-445

Located on front splash panel and lid of machine.



Part # A546-020 (P-300), A546-129 (P-400)

Located near warmer plates.



Part # A546-020 (P-300), A546-129 (P-400)

Located near water faucet.



Part # A546-213

Located on front splash panel.



Part # A71949

Located on brew baskets.



Operation

CAUTION

HOT LIQUID HAZARD!

Water used for brewing coffee is very hot. Use caution when brewing, pouring, or transporting coffee. Accidental spills may result in severe burns.

- 1) RAPS Brewers require the accessory warmer base placed over the pegs on the brew shelf before brewing into a shuttle. Plug the base into the receptacle on the side of the brewer. The receptacle is only energized when a shuttle is in place.
- 2) Place an empty, warm shuttle or airpot on the shelf, counter, or accessory base (depending on model) under the brew head. Turn on the warmer if a shuttle is used.
- 3) If the shuttle is not warm, allow the warmer to heat the shuttle. Only a short brew of water will speed this. A cold shuttle will significantly lower the temperature of the brewed coffee.
- 4) Remove the filter basket and line with a filter paper. Paper size is 13 x 5 for the smaller basket, BB1.5, and 14 x 5 for the larger, BB2.0.
- 5) Place ground coffee in the filter basket. Your coffee supplier can help you select the right amount of coffee and grind. Coffee brewing experts recommend between 6.5 and 8 ounces of coffee per gallon of water for most applications. A full shuttle is 1.4 gallons and a full airpot is 0.80 gallon.
- 6) Slide the basket into the brewer making sure the spout lines up with the top of the shuttle or airpot.
- 7) Check that the correct batch size is selected. Check the WATER HOT light. If lit, press start.
- 8) Brew time is about 4 minutes for a full shuttle, less for airpots and half batches. After the brew, allow the coffee to drip for 1 to 2 minutes.

CAUTION

Coffee basket contains very hot water until the drip is completed. Early removal of a dripping basket could result in burns.

- 9) Dump the grounds from the basket and rinse for the next brew. Coffee is ready to serve.
- 10) The shuttle may be placed on remote warming stations. Use caution when moving a full shuttle.

Adjustments

WARNING

Electrical Shock Hazard!

Dangerous electric voltages are present near adjustable components. All adjustments should be performed by qualified service personnel only.

All adjustable components are located under the top cover. To access these parts:

- 1) Shut off the electric line to the brewer or unplug the brewer.
- 2) Remove the single screw fastening the top cover. Remove the top cover.
- 3) Pull forward and lift off the top cover.

Brew Volume, Brew Timer

The brew volume of the brewer is controlled by its timer. The batch size is directly proportional to the timer setting. The timer adjustment is located under the top cover. On twin brewers, there is one timer for each brew head.

Depending on the model, American Metal Ware offers three types of timer adjustments. Look at the instructions for the type of timer you have. There will always be a small variation ($\pm 5\%$) in level from batch to batch.

Note: Always adjust bypass before adjusting timer because bypass affects brew rate.

Before making the timer adjustment, do the following:

- 1) Brew a batch of water to determine where the level falls. Using a stop watch, determine the current brew volume.
- 2) To determine the desired time setting, use the following formula:

$$\text{desired brew time} = \frac{\text{desired brew volume}}{\text{current brew volume}} \times \text{current brew time}$$

Adjusting the Timer

Standard single batch timer: RAP and P models without half batch include this timer, (see Figure 1). This timer is adjustable from 1 to 8 minutes. After removing the cover, do the following:

- 1) Use the timer label to make an approximate adjustment of the timer.
- 2) After adjusting the timer, brew a batch of water to check the volume. Repeat adjustment, tweaking the timer knob until the volume is correct.

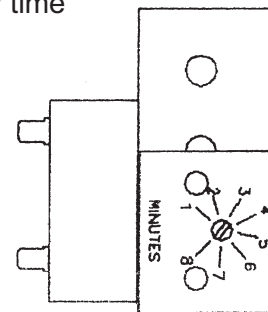


Figure 1
Single Batch Timer

Two Batch Timer with Knob Adjustment, See Figure 2:

This timer is adjustable from 15 seconds to 5 minutes. Locate the adjustment knobs under the top cover.

Set this timer by adjusting the knob. The batch selector switch picks the adjustment potentiometer which the timer will see.

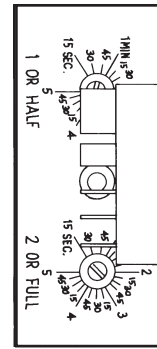


Figure 2
Two Batch Timer

Two Batch Timer with Counter Adjustment, See Figure 3:

The two batch size timer may also be used with optional counter potentiometer to ease adjustments. Each batch size is adjustable from 00 to 99. The timer settings for this timer are tabulated on the table below. This chart is for making an approximate setting. You may need to click up or down to make fine adjustments to volume. Each number is about 3 seconds.

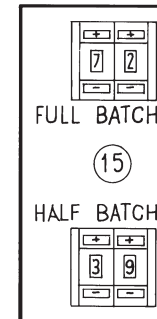


Figure 3
Two Batch Timer
w/Counter Adjustment

Counter Settings for NCC Q4F-0300-341AM Timers

| Counter Setting | Time (min:sec) | Counter Setting | Time (min:sec) | Counter Setting | Time (min:sec) |
|-----------------|----------------|-----------------|----------------|-----------------|----------------|
| 00 | 0:15 | 35 | 2:03 | 65 | 3:26 |
| 10 | 0:46 | 40 | 2:17 | 70 | 3:39 |
| 15 | 1:01 | 45 | 2:31 | 75 | 3:53 |
| 20 | 1:17 | 50 | 2:45 | 80 | 4:06 |
| 25 | 1:32 | 55 | 2:59 | 85 | 4:20 |
| 30 | 1:47 | 60 | 3:13 | 99 | 5:00 |

Bypass Adjustment

The bypass valve adjusts the amount of water which bypasses coffee grounds and dilutes the final brew (see Figure 4). The factory setting is no bypass.

Bitter coffee results when the amount of ground coffee is too small. Therefore, if your coffee is brewing too strong, it is better to adjust the bypass valve instead of reducing the amount of coffee.

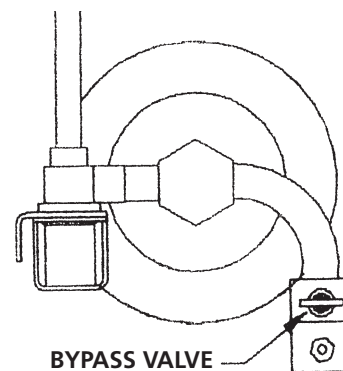


Figure 4
Bypass Valve

To Adjust the Bypass:

- 1) Shut off and open brewer as described at the beginning of the adjustments section.
- 2) Locate the bypass valve for the brew head you wish to adjust. Valve is on the right and front of the BREW valve.
- 3) Open the valve (counter clockwise) to the desired setting. Use the table below as a guide:

| BYPASS SETTING | BYPASS: % OF TOTAL BREW |
|----------------|-------------------------|
| closed | 0 |
| 1 turn | 8 |
| 2 turns | 12 |
| 3 turns | 22 |
| 4 turns | 33 |

- 4) Measure the bypass setting:
 - a) Remove the brew basket.
 - b) Place an empty shuttle without its lid under the spray head.
 - c) Place a measuring cup under the bypass nozzle.
 - d) Press START and brew water for about thirty seconds or until measuring cup is almost full. Press STOP.
 - e) Record the amount of water in the bypass measuring cup.
 - f) Add this to the water in the shuttle and record, measure the total amount of water.
 - g) The bypass percent is calculated as:

$$\text{Bypass \%} = (\text{Bypass Volume} / \text{Total Volume}) \times 100$$

- 5) Tweak the valve adjustment until the bypass is set as desired.

Note: The bypass is accurate to $\pm 4\%$.

Thermostat Adjustment

The main thermostat adjusts the water temperature in the tank. Factory setting is 200°F. This is the ideal temperature for brewing most coffee. Water should never boil in the tank. If water is boiling, adjust the thermostat. There are two types of thermostats available. Mechanical is standard and solid state is optional. See the adjustment instructions for the thermostat in your brewer.

Standard Mechanical Thermostat:

- 1) Shut off power and open cover.
- 2) Locate thermostat mounted on tank. See Figure 5.
- 3) Turn the shaft counter clockwise to decrease temperature, opposite to increase temperature.

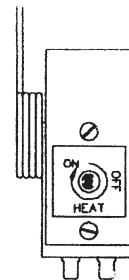


Figure 5
Mechanical Thermostat

- 4) If the maximum temperature adjustment needs to be increased, insert a small flat screwdriver into the shaft. Turn the calibration screw counter clockwise to increase the maximum temperature.

Optional Solid State Thermostat: This control maintains temperature within 3°F. The adjustable range is from 155°F to 205°F.

See Figure 6.

- 1) Shut off power and open top cover.
- 2) Locate thermostat on bracket mounted to front panel.
- 3) Adjust the knob to the temperature desired. This control cannot be set above 205°F.

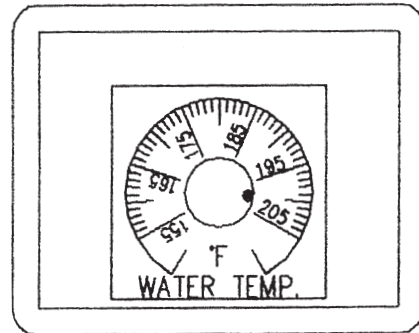


Figure 6
Solid State Thermostat

Optional Brew Thermostat Adjustment: Your brewer may include the optional low temp/no brew thermostat, (see Figure 7). This will not allow a brew unless the water is up to temperature. The factory setting is 192°F. If you wish to adjust this, do the following:

- 1) Shut off power and remove top cover.
- 2) Locate the thermostat mounted on the water tank.
- 3) To increase the set point, turn the shaft clockwise. We do not recommend adjusting this above 192°F which may cause excessive delays between batches.
- 4) For accurate setting of the thermostat, remove the bulb from the brewer and immerse in water known to be 190°F. Adjust the knob so the thermostat closes at this point.

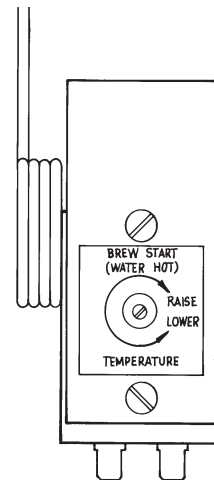


Figure 7
Brew Thermostat

Cleaning



Burn Hazard!

Hot liquids and surfaces are present in this equipment. To avoid burns use caution when cleaning. Rinse hot parts with cold water before cleaning. Use gloves or a heavy cloth when removing hot parts from brewer.

After Each Brew:

- 1) Dispose of grounds and rinse brew basket.
- 2) Rinse shuttle or airpot containers before reuse.

Every Day:

- 1) Wash brew basket with warm soapy water. The wire basket is removable to aid cleaning.
- 2) Remove spray head(s), located above brew basket(s), using gloves or a heavy towel. Wash off coffee oils and clean any plugged holes.
- 3) Clean shuttles with warm soapy water and a brush or towel.
- 4) Clean airpots with warm soapy water and bottle brush. Be careful, glass interior breaks easily. Use only a soft cloth and warm soapy water or stainless steel polish on the outside to avoid scratches.
- 5) Wipe exterior of brewer with a damp cloth. Do not use abrasives which will scratch surface.
- 6) If shuttles are to be left on warmer all night, fill with water to avoid coffee oil burn-in.

Weekly or Bi-Weekly, Depending on Use

- 1) Fill shuttles with one gallon, 2/3 full, of hot water.
- 2) Pour into the shuttle liners the recommended concentration of urn cleaner (excessive amounts of cleaner will attack the stainless steel).

Urn cleaners that have been used successfully:

DIP-IT, manufactured by Economics Laboratories, Inc.
4 Corporate Park Drive
White Plains, NY 10604

OXYLITE, manufactured by Avril, Inc., Syndet Division
601 N. Third Street
Reading, PA 19601

- 3) Scrub the liner interior with a plastic bristle brush.
- 4) Remove the knurled nut at the top of the gauge glass and clean the glass with a small bottle brush.
- 5) Pour out the contents of the shuttle.
- 6) Remove the handle assembly of the shuttle faucet by unscrewing the plastic bonnet.
- 7) Gently wash the faucet seat cup with a soft cloth and warm soapy water.
- 8) Wash the faucet shank with a bottle brush.
- 9) Soak airpot pick-up tube assembly in hot soapy water. Urn cleaner may be used for stronger cleaning.
- 10) Clean the warmer and bottom of shuttle surfaces. These surfaces must be clean for proper heat transfer.
- 11) Polish the exterior of the brewer with stainless steel cleaner. Use the appropriate cleaner for brass, copper, or vinyl if these optional finishes are provided.

Service

The rest of this manual contains information to aid the service person who is working on this equipment. This page has information on performing *common service tasks*. Following this is the *Troubleshooting* section which can help diagnose problems which are divided into three basic systems: filling, heating, and brewing.

Next is an *illustrated parts breakdown* which will help in the selection of repair parts. If further assistance is needed, call our Technical Service Department at **(502) 425-2776** or **800-695-4500** (USA & Canada only) Monday -Friday between 8:00 am and 8:00 pm EST.

Wiring diagrams are also provided. Locate the basic diagram for the model you are working with. If there are any options, see Diagram #091-548 (page 31 of this manual) which shows the wiring alterations for Shuttle Brewer & Airpot/Shuttle Brewer options.

Service (con't)

Drain Water Tank

Always empty the tank before shipping.



Draining of tank should be performed by a qualified service technician. The tank contains very hot water. May cause severe burns.

Note: Brewer may contain over 5 gallons of hot water.

- 1) Prepare a heat resistant container to drain tank water into.
- 2) Shut off power to the brewer.
- 3) Remove the front access panel.
- 4) Pinch or clamp the silicone hose connected to fill valve.
- 5) Disconnect hose from outlet barb on fill valve.
- 6) Place hose over drain and release clamp.
- 7) Allow the tank to drain completely.

NOTE: It may be necessary to pinch the hose and stop the water before container is full. Carefully reinstall hose over fill valve outlet, then empty container. Repeat steps 4-7 completely to drain tank.

Remove Brew Valve

- 1) Disconnect electric power to machine.
- 2) Remove top cover and remove wires and small tube from valve.
- 3) Tilt inlet of valve down and pull sideways out of spray tee.
- 4) Clamp rubber tubing and disconnect valve from tubing.

Remove Heater

- 1) Disconnect power and remove top cover of brewer.
- 2) Disconnect wire leads to heater.
- 3) Remove tank cover by loosening retaining screw. Cover is lifted up with heater attached. Heater is then removed.
- 4) Replace heater with sealing washers in same configuration. When tightening nuts, hold element so it does not twist.
- 5) Replace tank cover ensuring O-ring seal is good.
- 6) Replace heater wires. Be sure all electrical connections are secure.

Troubleshooting: Filling, Heating, and Brewing

| Filling Problems <i>The filling system consists of the following components:</i> <ul style="list-style-type: none"> • Liquid Level Control, located behind the brewer front panel. • Liquid Level Probes, located on the tank top, secured by wing nut, under the top cover. • Fill Valve, located behind the front panel. | | | |
|---|---|---|--|
| Problem | Possible Cause | Service Check | Remedy |
| Overfilling water tank even when power is off. | Fill valve not sealing properly. | Water entering tank continuously, usually slowly. | Disassemble valve and clean out dirt. Valve may need new plunger if seal is worn. |
| | Fill valve installed backwards. | Look for direction of arrow on valve body. | If arrow on valve is pointing toward water inlet, remove valve and install correctly. |
| Overfilling water tank only when power is on. | High electrode coated with lime or faulty. | Jumper HI terminal on level control to metal enclosure stops fill. | Remove electrode assembly and clean both probes. If this does not work, replace assembly. |
| | Missing or faulty connection of C terminal on level control to metal enclosure. | Jumper from C terminal to metal body stops fill. | Make secure connection of C to metal body. |
| | Fill valve connected to heat terminal on level control. | Check connections. | Connect black lead for valve to FILL on level control. |
| | Liquid level control is faulty. | Jumper from HI to C or metal enclosure does not stop fill. | Replace level control. |
| Tank does not refill. | No power at equipment. | Nothing operates. | Check main switch or circuit breaker, brewer's circuit breaker or power switch if provided. |
| | No water at equipment. | Cracked water inlet fitting. | Make sure all water supply line valves are open. |
| | Water strainer clogged. | Water pressure before strainer but not after. | Remove and clean or replace strainer's mesh. |
| | No power to level control. | Check for 120V AC across H and N terminals on level control. | If no voltage, check for loose or broken wires. |
| | Level control faulty. | Disconnect probe wire to HI terminal on level control. Check for 120V at FILL terminal. | If no 120V at FILL terminal, replace level control. |
| | Electrodes faulty. | Tank fills only when probe wire is disconnected from HI terminal on level control. | Replace electrodes. If no remedy, check for improper wiring or level probe tip touching metal. |
| | Fill valve faulty. | 120V is across FILL and N on level control, but no fill. | Disassemble valve and clean or replace plunger if frozen. If plunger is OK, coil may need replacement. |

Troubleshooting: Filling, Heating, and Brewing

| Heating Problems <i>The heating system consists of the following components:</i> <ul style="list-style-type: none"> • Liquid Level Control, located behind the front enclosure panel. • Liquid Level Probes, located on the tank top, secured by wing nut, under the top cover. • Thermostat, located on the tank or on the front of top control panel under top cover. • Heater Relay, located in top control section under top cover. • Heating Elements, located on tank top under top cover. | | | |
|---|---|---|--|
| Problem | Possible Cause | Service Check | Remedy |
| Tank does not heat. | Low electrode faulty or covered w/lime. | Jumper from XL terminal on level control to metal body allows heating. | Clean electrodes, check wiring. If no remedy, replace electrodes. |
| | Level control faulty. | Check for 120V between H and N terminals on level control. If OK, jumper between XL and metal body and check for 120V between HEAT and N terminals. | If 120V is not at HEAT, replace level control. |
| | Thermostat faulty or out of calibration. | Make sure thermostat is turned on. Jumper across thermostat allows heating. | Recalibrate thermostat. If no remedy or thermostat does not cycle, replace thermostat. |
| | Heater relay coil faulty. (electric heat) | Check for 120V across contactor coil. | If correct voltage, but contactor not closing, replace contactor. |
| | Heater contactor contacts faulty. | Check for heater voltage between each heater pole on contactor, and different pole. | If no continuity across contactor when it is closed, replace contactor. |
| | Heater faulty. | Check resistance across elements with wires disconnected. | If resistance is much different than 10 to 15 ohms, replace heater. |
| Recovery time is very long. | Heater faulty. | See above. | See above. |
| | Low temp/no brew thermostat set too high. | Water is above 190 degrees F, but HOT WATER light is off. | Turn down brew thermostat, see adjustments. |

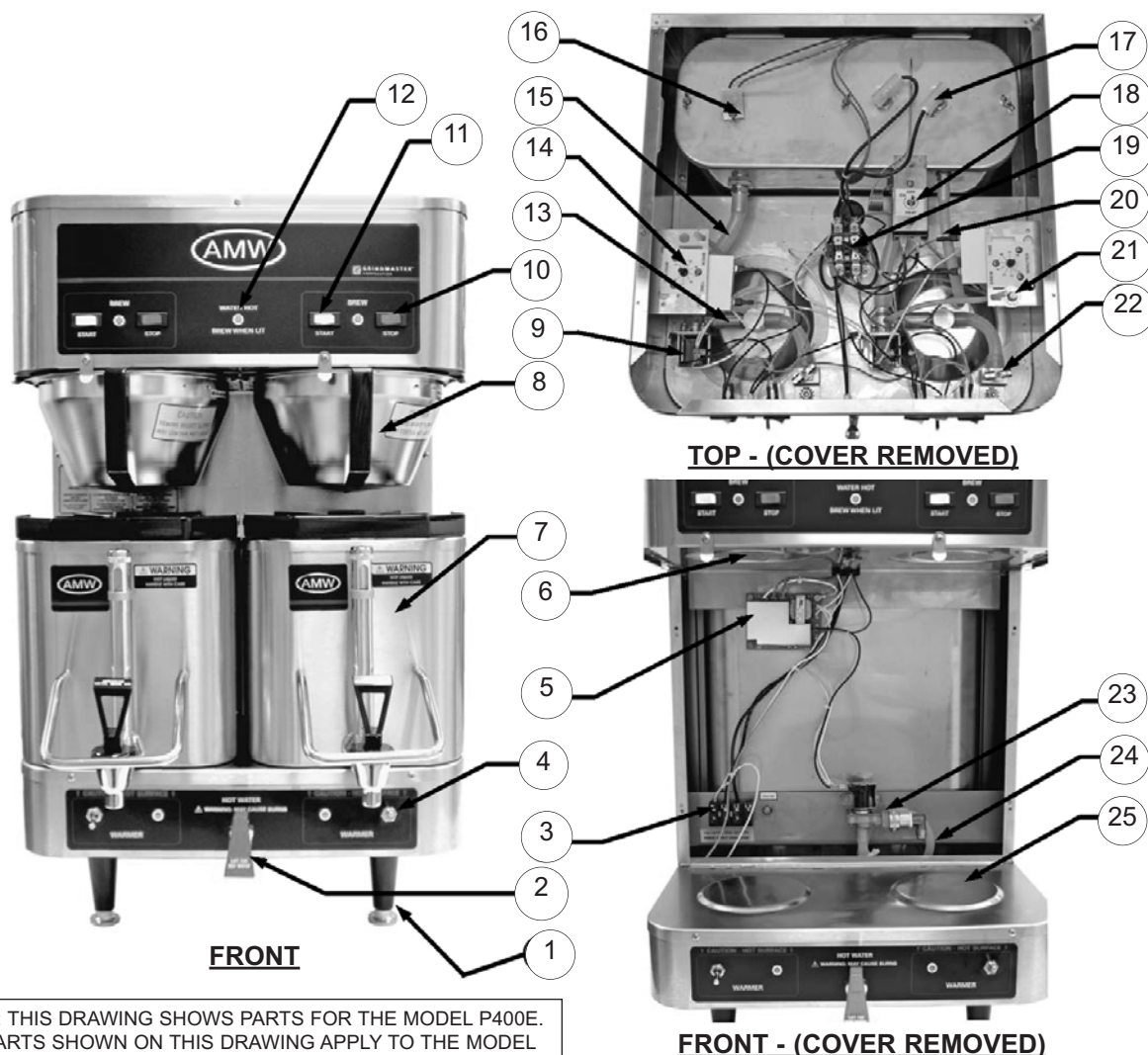
If you still need help, call our Technical Service Department at (502) 425-4776 or (800) 695-4500 (USA & Canada only) Monday thru Friday 8 am - 8 pm EST or an authorized service center in your area. Please have the model and serial numbers ready so that accurate information can be given. Prior authorization must be obtained from Grindmaster Corporation's Technical Service Department for all warranty claims.

Troubleshooting: Filling, Heating, and Brewing

| Brewing Problems | | | |
|---|---|--|---|
| <p><i>The brewing system consists of the following components:</i></p> <ul style="list-style-type: none"> • Start and Stop, switches located in the top control panel. • Brew Timer, located in the top control section under the top cover. • Brew Valve, located in the top control section under the top cover. | | | |
| Problem | Possible Cause | Service Check | Remedy |
| Brew volume too large or too small. | Timer out of adjustment. | Compare timer setting to factory setting chart. | Adjust timer. |
| | Pressure not adequate at urn. | Fill valve should cycle on and off frequently during brew cycle when all brew heads are used. | If fill valve does not cycle or takes too long to refill, be sure water line is 3/8" and pressure is uninterrupted 30psi. |
| | Spray head clogged. | Visual | Clean all holes. |
| | Brew valves clogged with lime. | Visual, inspect brew valve. | Clean lime from valve. Seat cup or entire valve may need replacement. |
| | Timer faulty. | Brew time does match timer setting. Timer not adjustable. | Replace timer. |
| Brew volume erratic. (there is always some small variation from batch to batch) | Timer faulty. | Measure brew time for inconsistencies. | If time is different from batch to batch, replace timer. |
| | Pressure fluctuations at urn. | Check pressure at urn inlet. | Plumb water line so its pressure is not influenced by other appliances. |
| Brew will not start. | Circuit breaker tripped or faulty. | If circuit breaker button is out, breaker is tripped. | If tripped, find cause and reset. If faulty, replace. |
| | Brew valve faulty. | Check 120V across brew valve. | If 120V is across brew valve, but brew valve doesn't open, replace coil or valve. |
| | Stop switch faulty. | Check for continuity across stop switch when not pressed. | If no continuity, replace switch. |
| | Start switch faulty. | Check 120V between S.S. and N on timer when start is pressed. | If start switch does not provide 120V start signal, replace switch. |
| | Low temp/no brew thermostat set too high. | Water is above 190°F (88°C), but HOT WATER light is off. | Turn down brew thermostat, see adjustments. |
| | Timer faulty. | Check 120V between H and N on timer. If OK, check for 120V between BREW and N on timer after pressing start. | If no 120V BREW output from timer, replace timer. |
| Spray head will not stop dripping water. (spray heads normally drip slightly after brew) | Boiling tank. | If drip is from right side, check for water from overflow outlet at top of tank. | Turn down thermostat. If that doesn't cure, check for faulty thermostat or heater relay. |
| | Limed up brew valve. | Visual check of valve. | Clean valve. Valve seal or entire valve may need replacement. |

Parts Illustration for Models P300E & P400E

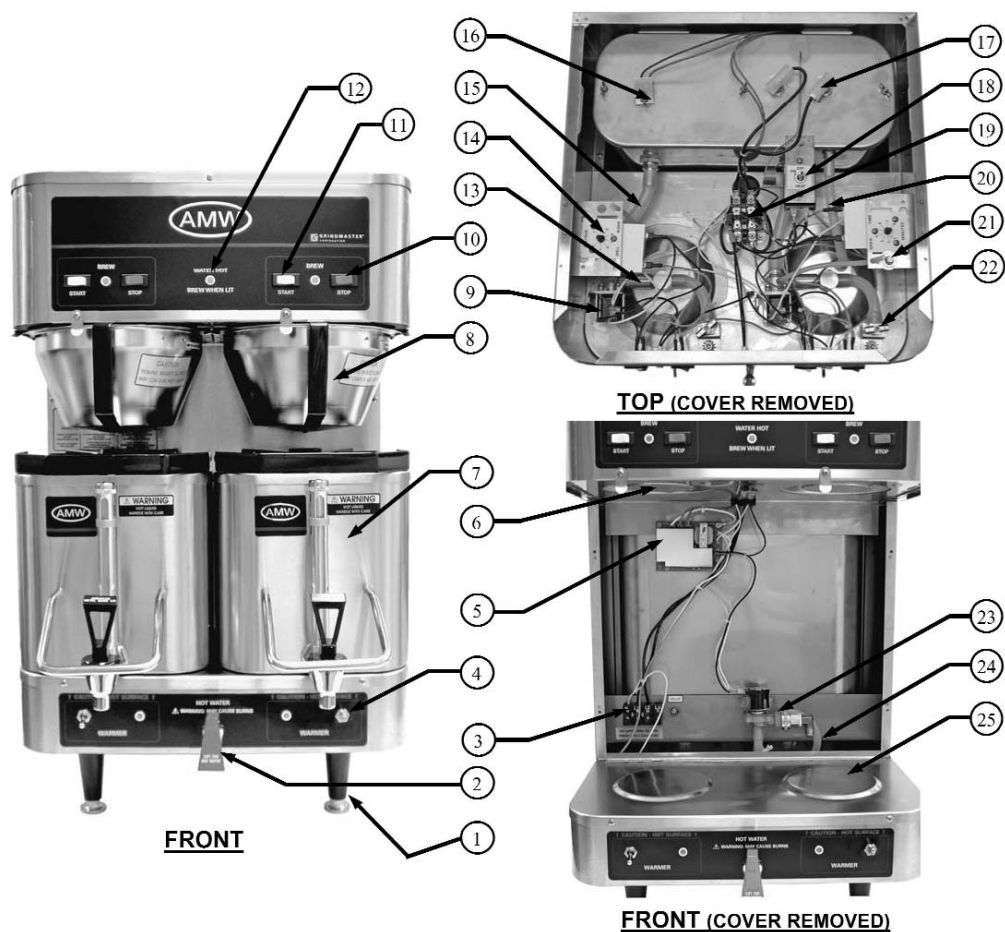
| Item | Part # | Description | Item | Part # | Description |
|------|------------|----------------------------------|------|----------|---|
| 1 | A545-034 | LEG, 4" PLASTIC W/ SS FOOT | 13 | A725-081 | BRASS SPRAY TEE W/ BYPASS TUBING |
| 1 | A545-015 | LEG, 4" SS (OPTIONAL) | 14 | A530-009 | BREW TIMER 0-8 MINUTES |
| 2 | A537-043 | HOT WATER FAUCET W/ NUT | 15 | A585-021 | SPRAY TUBING 3/8" ID X 5/8"OD X 6"LG |
| 3 | A531-035 | TERMINAL BLOCK | 16 | A712-018 | ELECTRODE ASSEMBLY |
| 4 | A531-026 | TOGGLE SWITCH | 17 | A535-059 | TANK HTR 6.6 KW @ 240V |
| 5 | A549-006 | LIQUID LEVEL CONTROL BRD | 18 | A712-046 | THERMOSTAT W/ GROMMET |
| 6 | APT400-105 | SPRAY HEAD | 19 | A515027 | DPST POWER RELAY |
| 7 | ACS-LL | SHUTTLE W/ LOCKING LID | 20 | A585-023 | OVERFLOW TUBE 1/2"OD X 5/16"ID 7"LG |
| 8 | ABB1.5SS | BREW BASKET, SS | 21 | A515072 | CIRCUIT BREAKER 10 AMP |
| 9 | A537-129 | BREW VALVE | 22 | A718-111 | BYPASS VALVE ASSEMBLY |
| 10 | A531-005 | STOP SWITCH (before March 2000) | 23 | A718-198 | FILL VALVE W/ FITTINGS (after 01-26-00) |
| 10 | A531-063 | STOP SWITCH (after March 2000) | 23 | A537-154 | FILL VALVE ONLY (after 01-26-00) |
| 11 | A531-004 | START SWITCH (before March 2000) | 23 | A725-072 | FILL VALVE RETROFIT KIT (before 01-26-00) |
| 11 | A531-062 | START SWITCH (after March 2000) | 24 | A585-016 | TUBING FILL 1.6' LG & HOT WATER 1.5' LG |
| 12 | A515016 | PILOT LIGHT | 25 | A535-018 | WARMER ELEMENT (below warmer shelf) |



NOTE: THIS DRAWING SHOWS PARTS FOR THE MODEL P400E. ALL PARTS SHOWN ON THIS DRAWING APPLY TO THE MODEL P300E, EXCEPT THE QUANTITIES MAY CHANGE. DEPENDING ON THE OPTIONS INCLUDED, YOUR BREWER MAY HAVE DIFFERENT PARTS

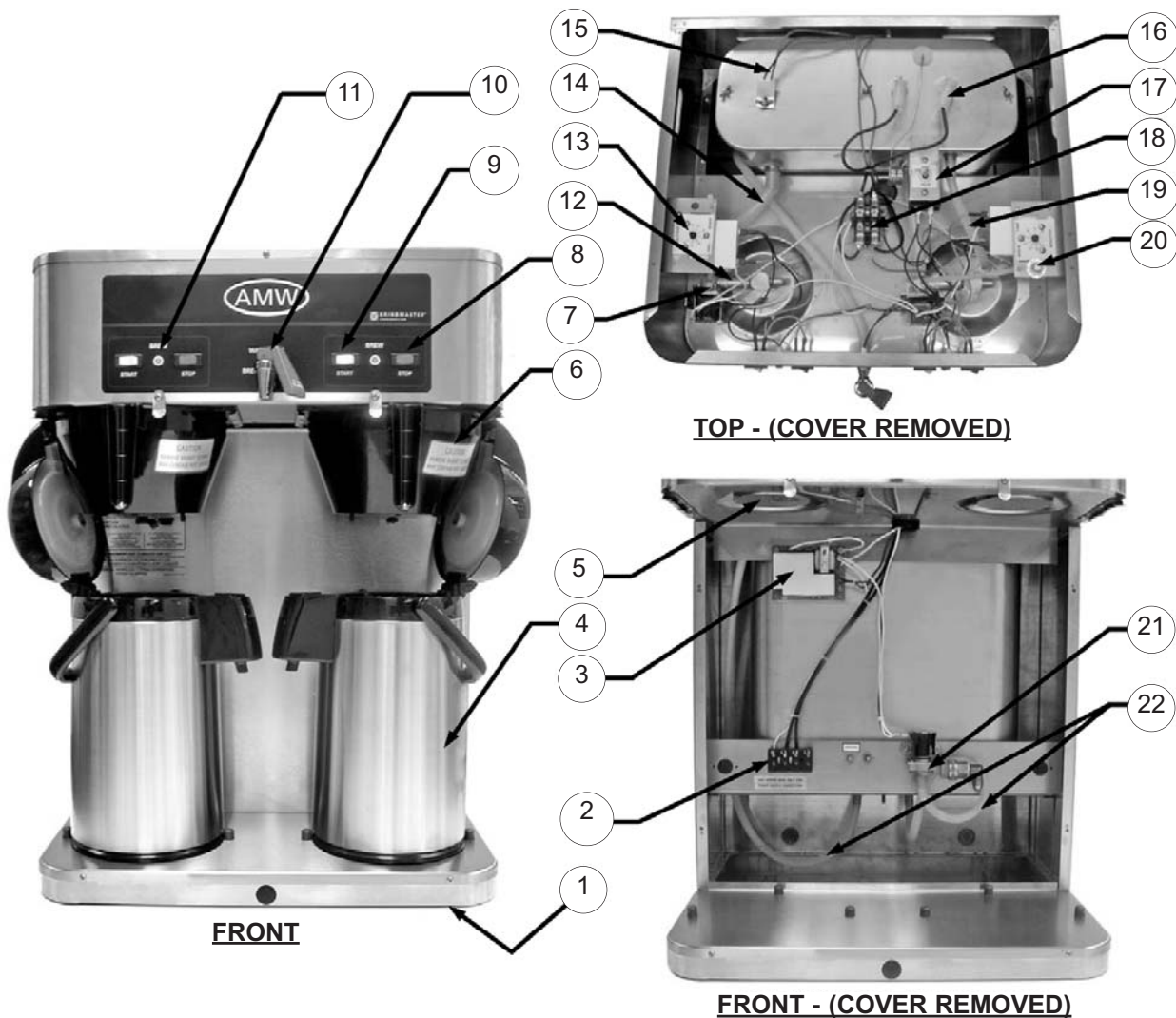
Parts Illustration for Model P400ESHP

| Item | Part # | Description | Item | Part # | Description |
|------|------------|----------------------------------|-----------|----------|---|
| 1 | A545-034 | LEG, 4" PLASTIC W/ SS FOOT | 15 | A585-021 | SPRAY TUBING 3/8" ID X 5/8"OD X 6"LG |
| 1 | A545-015 | LEG, 4" SS (OPTIONAL) | 16 | A712-018 | ELECTRODE ASSEMBLY |
| 2 | A537-043 | HOT WATER FAUCET W/ NUT | 17 | A535-068 | TANK HTR 3.7 KW @ 240V |
| 3 | A531-035 | TERMINAL BLOCK | 18 | A712-046 | THERMOSTAT W/ GROMMET |
| 4 | A531-026 | TOGGLE SWITCH | 19 | A514005 | CONTACTOR |
| 5 | A549-006 | LIQUID LEVEL CONTROL BRD | 20 | A585-023 | OVERFLOW TUBE 1/2"OD X 5/16"ID 7"LG |
| 6 | APT400-105 | SPRAY HEAD | 21 | A515072 | CIRCUIT BREAKER 10 AMP |
| 7 | ACS-LL | SHUTTLE W/ LOCKING LID | 22 | A718-111 | BYPASS VALVE ASSEMBLY |
| 8 | ABB1.5SS | BREW BASKET, SS | 23 | A718-198 | FILL VALVE W/ FITTINGS (after 01-26-00) |
| 9 | A537-129 | BREW VALVE | 23 | A537-154 | FILL VALVE ONLY (after 01-26-00) |
| 10 | A531-005 | STOP SWITCH (before March 2000) | 23 | A725-072 | FILL VALVE RETROFIT KIT (before 01-26-00) |
| 10 | A531-063 | STOP SWITCH (after March 2000) | 24 | A585-016 | TUBING FILL 1.6' LG & HOT WATER 1.5' LG |
| 11 | A531-004 | START SWITCH (before March 2000) | 25 | A535-079 | WARMER ELEMENT 240V (below warmer shelf) |
| 11 | A531-062 | START SWITCH (after March 2000) | not shown | A515027 | WARMER RELAY |
| 12 | A515016 | PILOT LIGHT | not shown | A532-001 | FUSE HOLDER |
| 13 | A725-081 | BRASS SPRAY TEE W/ BYPASS TUBING | not shown | A532-010 | FUSE 1A |
| 14 | A530-009 | BREW TIMER 0-8 MINUTES | not shown | A515043 | TRASFORMER STEP DOWN |



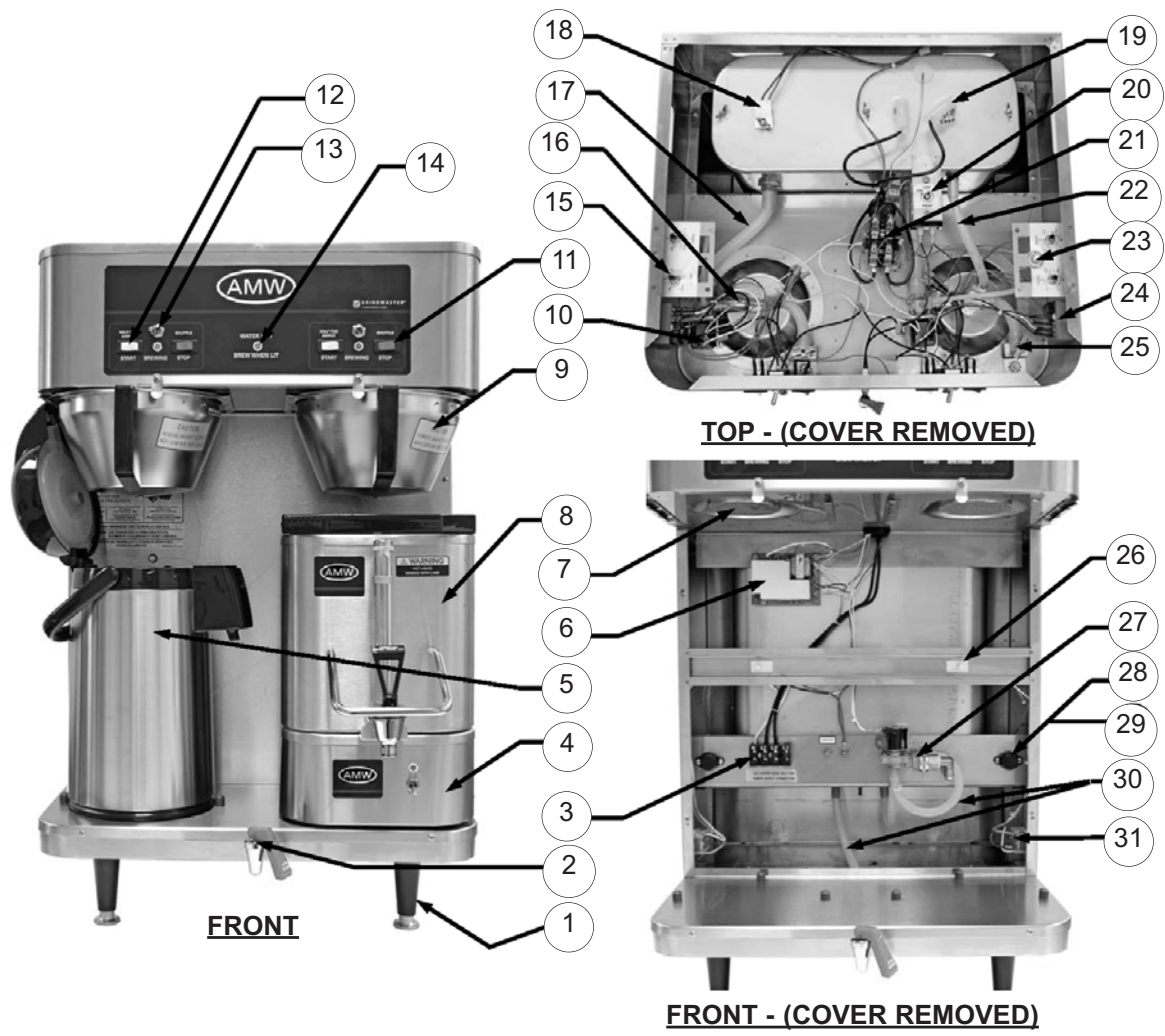
Parts Illustration for Model RAP400E

| Item | Part # | Description | Item | Part # | Description |
|------|------------|------------------------------------|------|----------|---|
| 1 | A548-072 | LEG, RUBBER (RAP400) | 11 | A515016 | PILOT LIGHT |
| 1 | A545-004 | LEG, PLASTIC 4" (OPTIONAL RAP 400) | 12 | A725-082 | SPRAY TEE KIT W/ BYPASS PLUG |
| 1 | A548-090 | LEG, PLASTIC PLUG (RAP300) | 13 | A530-009 | BREW TIMER 0-8 MINUTES |
| 2 | A531-035 | TERMINAL BLOCK | 14 | A585-021 | SILICONE TUBING 3/8"ID X 5/8"OD X 6"LG |
| 3 | A549-006 | LIQUID LEVEL BOARD | 15 | A712-018 | ELECTRODE ASSEMBLY |
| 4 | AAP-3 | AIRPOT | 16 | A535-059 | TANK HTR 6.6 KW @ 240V |
| 5 | APT400-105 | SPRAY HEAD | 17 | A712-046 | THERMOSTAT W/ GROMMET |
| 6 | ABB1.5P | BREW BASKET, PLASTIC | 18 | A515027 | POWER RELAY |
| 7 | A537-129 | BREW VALVE | 19 | A585-023 | OVERFLOW TUBE 1/2"OD X 5'16ID X 7LG |
| 8 | A531-005 | STOP SWITCH (before March 2000) | 20 | A515072 | CIRCUIT BREAKER 10 AMP |
| 8 | A531-063 | STOP SWITCH (after March 2000) | 21 | A718-198 | FILL VALVE W/ FITTINGS (after 01-26-00) |
| 9 | A531-004 | START SWITCH (before March 2000) | 21 | A537-154 | FILL VALVE ONLY (after 01-26-00) |
| 9 | A531-062 | START SWITCH (after March 2000) | 21 | A725-072 | FILL VALVE RETROFIT KIT (before 01-26-00) |
| 10 | A537-043 | HOT WATER FAUCET | 22 | A585-016 | TUBING FILL 1.6' LG & HOT WATER 3.75' LG |



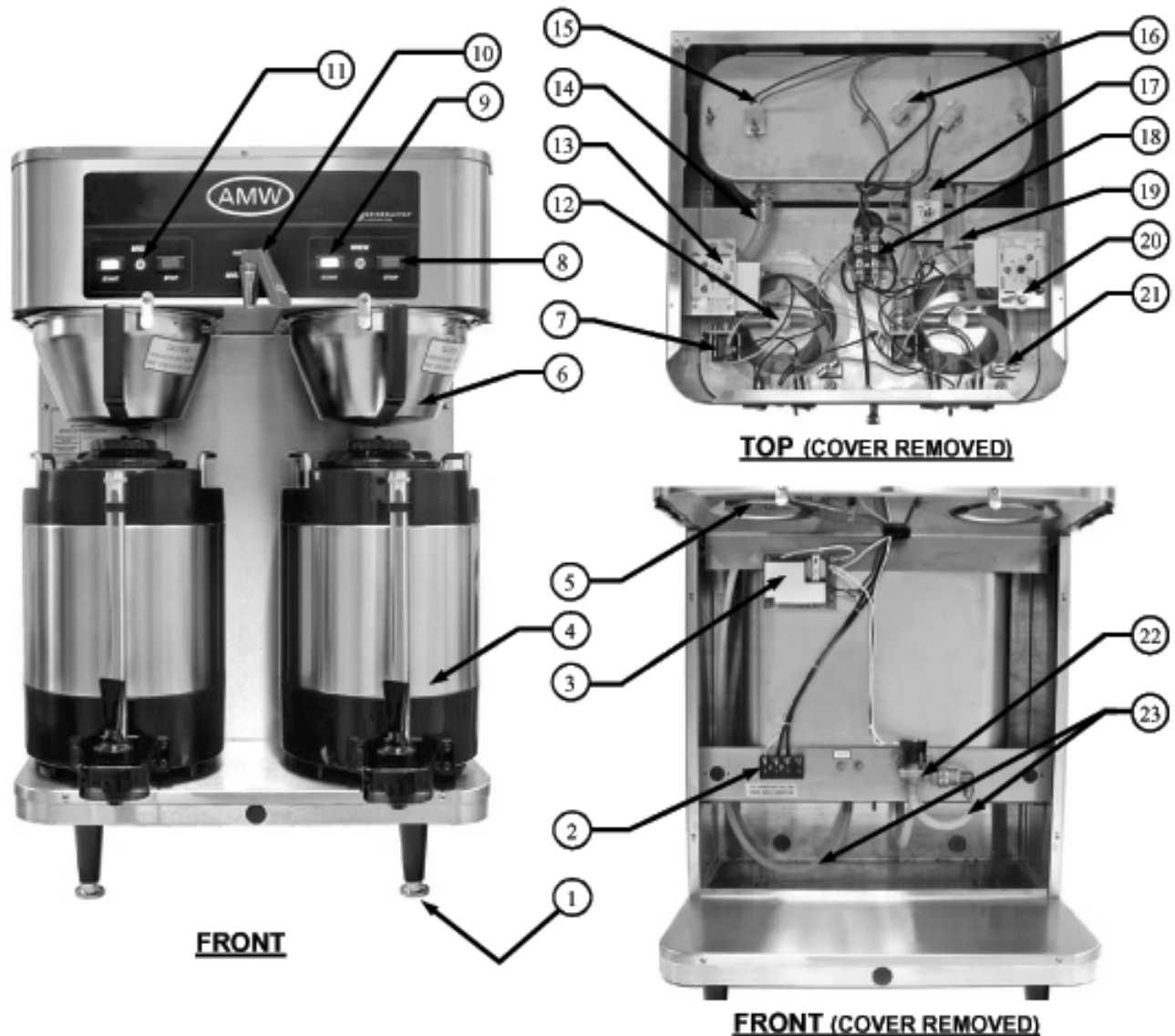
Parts Illustration for Model RAPS400E

| Item | Part # | Description | Item | Part # | Description |
|------|------------|----------------------------------|------|----------|---|
| 1 | A545-034 | LEG, 4" PLASTIC W/ SS FOOT | 16 | A725-081 | BRASS SPRAY TEE W/ BYPASS TUBING |
| 1 | A545-015 | LEG, 4" SS (OPTIONAL) | 17 | A585-021 | SPRAY TUBING 3/8" ID X 5/8"OD X 6"LG |
| 2 | A537-043 | HOT WATER FAUCET W/ NUT | 18 | A712-018 | ELECTRODE ASSEMBLY |
| 3 | A531-035 | TERMINAL BLOCK | 19 | A535-010 | TANK HEATER 5KW @ 240V |
| 4 | AABW-R | ACCESSORY WARMER RIGHT | 20 | A712-046 | THERMOSTAT W/ GROMMET |
| 5 | AAP-3 | AIRPOT 3 LITER | 21 | A515027 | DPST POWER RELAY |
| 6 | A549-006 | LIQUID LEVEL CONTROL BOARD | 22 | A585-023 | OVERFLOW TUBE 1/2"OD X 5/16"ID 7"LG |
| 7 | APT400-105 | SPRAY HEAD | 23 | A515072 | CIRCUIT BREAKER 10 AMP |
| 8 | ACS-LL | SHUTTLE W/ LOCKING LID | 24 | A530-016 | 1/2 BATCH CUBE TIMER |
| 9 | ABB1.5SS | BREW BASKET, STAINLESS STEEL | 25 | A718-111 | BYPASS VALVE ASSEMBLY |
| 10 | A537-129 | BREW VALVE | 26 | A531-025 | MOMENTARY SWITCH |
| 11 | A531-005 | STOP SWITCH (before March 2000) | 27 | A718-198 | FILL VALVE W/ FITTINGS (after 01-26-00) |
| 11 | A531-063 | STOP SWITCH (after March 2000) | 27 | A537-154 | FILL VALVE ONLY (after 01-26-00) |
| 12 | A531-004 | START SWITCH (before March 2000) | 28 | A515062 | FUSE HOLDER |
| 12 | A531-062 | START SWITCH (after March 2000) | 29 | A532-002 | FUSE CLASS G 3 AMP |
| 13 | A550-159 | BATCH SELECTOR SWITCH | 30 | A585-016 | TUBING FILL 1.6' LG & HOT WATER 1.5' LG |
| 14 | A515016 | PILOT LIGHT | 31 | A550-279 | SINGLE RECEPTACLE NEMA 5-15R GFCI |
| 15 | A554-043 | POTENTIOMETER | | | |

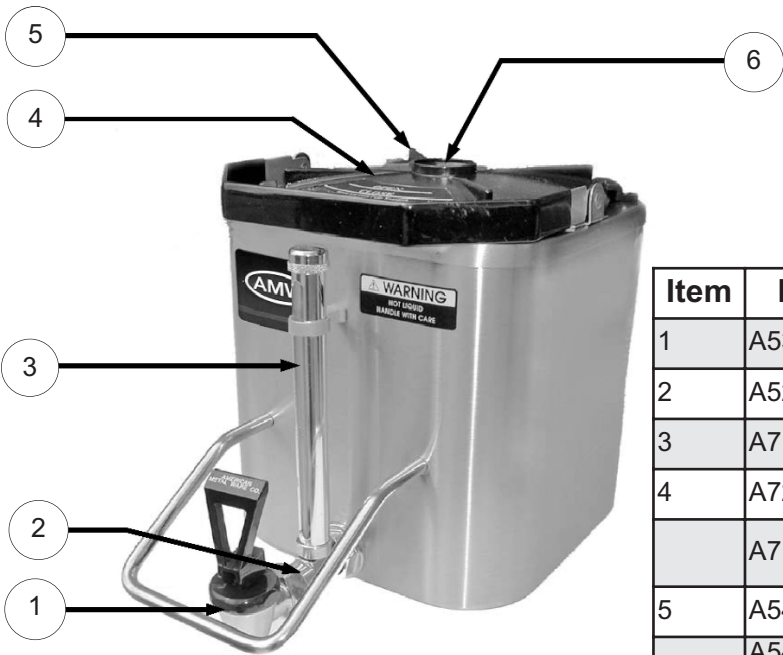


Parts Illustration for Model VSB-400

| Item | Part # | Description | Item | Part # | Description |
|------|------------|----------------------------------|------|----------|---|
| 1 | A545-034 | LEG, 4" PLASTIC W/ SS FOOT | 12 | A725-081 | SPRAY TEE KIT W/ BYPASS TUBING |
| 1 | A545-015 | LEG, 4" SS (OPTIONAL) | 13 | A530-009 | BREW TIMER 0-8 MINUTES |
| 2 | A531-035 | TERMINAL BLOCK | 14 | A585-021 | SILICONE TUBING 3/8"ID X 5/8"OD X 6"LG |
| 3 | A549-006 | LIQUID LEVEL BOARD | 15 | A712-018 | ELECTRODE ASSEMBLY |
| 4 | AVS-1.5 | SHUTTLE VACUUM | 16 | A535-059 | TANK HEATER 6.6 KW @ 240V |
| 5 | APT400-105 | SPRAY HEAD | 17 | A712-046 | THERMOSTAT W/ GROMMET |
| 6 | ABB1.5P | BREW BASKET, PLASTIC | 18 | A515027 | POWER RELAY |
| 7 | A537-129 | BREW VALVE | 19 | A585-023 | OVERFLOW TUBE 1/2"OD X 5/16"ID 7"LG |
| 8 | A531-005 | STOP SWITCH (before March 2000) | 20 | A515072 | CIRCUIT BREAKER 10AMP |
| 8 | A531-063 | STOP SWITCH (after March 2000) | 21 | A718-111 | BYPASS VALVE ASSEMBLY |
| 9 | A531-004 | START SWITCH (before March 2000) | 22 | A718-198 | FILL VALVE W/ FITTINGS (after 01-26-00) |
| 9 | A531-062 | START SWITCH (after March 2000) | 22 | A537-154 | FILL VALVE ONLY (after 01-26-00) |
| 10 | A537-043 | HOT WATER FAUCET | 22 | A725-072 | FILL VALVE RETROFIT KIT (before 01-26-00) |
| 11 | A515016 | PILOT LIGHT | 23 | A585-016 | TUBING FILL 1.6' LG & HOT WATER 1.5' LG |

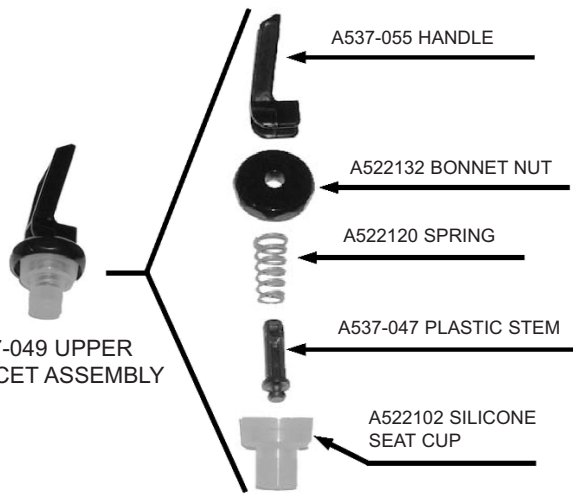


Parts Illustration for Shuttle CS-LL



| Item | Part # | Description |
|------|--------------------|-------------------------------|
| 1 | A537-053 | FAUCET MODEL ES |
| 2 | A522078 | SHANK W/ CHROME BONNET |
| 3 | A718-018 | GAUGE ASSEMBLY |
| 4 | A725-092 | KIT, SHUTTLE LID |
| | A713-027 | SS SHUTTLE COVER (not shown)* |
| 5 | A548-142 | LID RETAINING CLIP |
| 6 | A548-140 A61365 | LID STOPPER W/ O-RING |

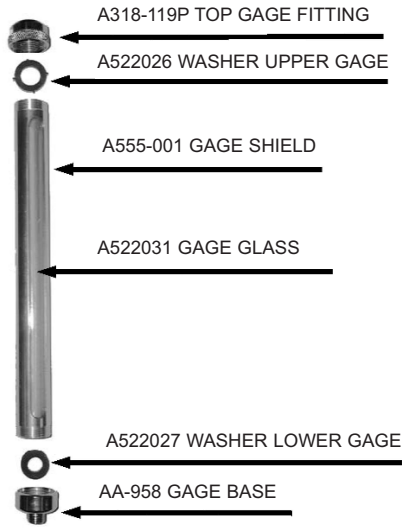
* S.S. Cover used until August 2001



A537-049 UPPER FAUCET ASSEMBLY

- A537-055 HANDLE
- A522132 BONNET NUT
- A522120 SPRING
- A537-047 PLASTIC STEM
- A522102 SILICONE SEAT CUP

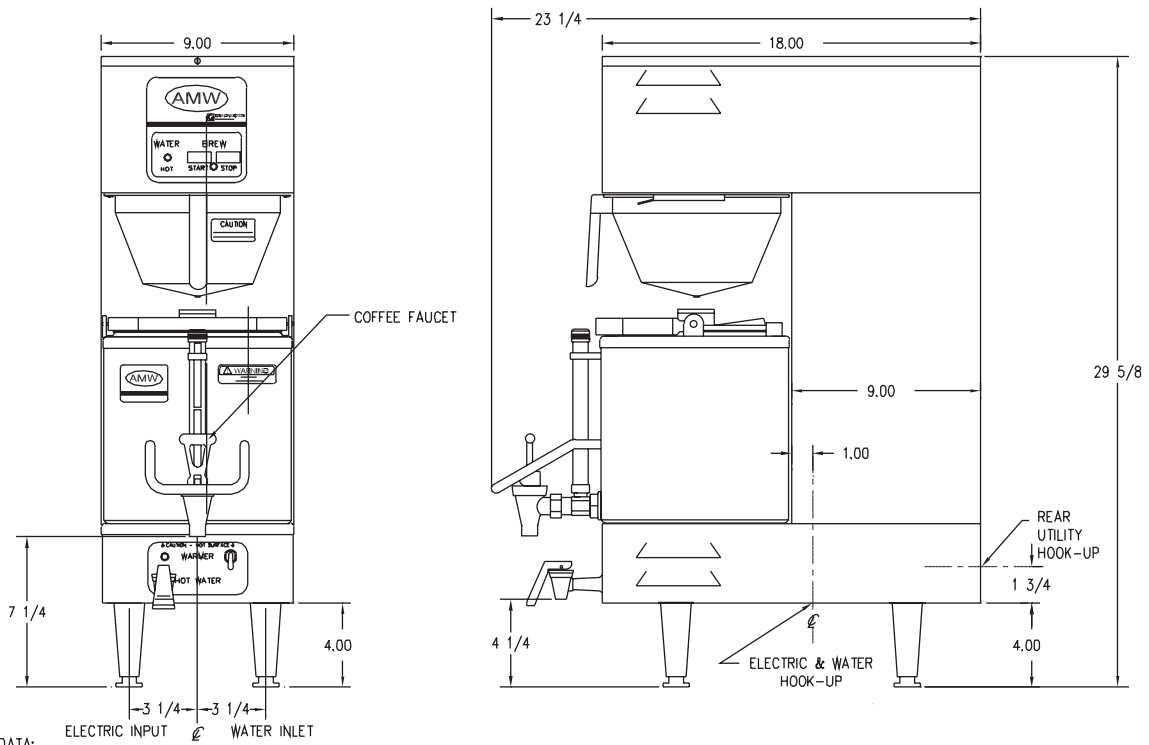
Upper Faucet A537-049



- A318-119P TOP GAGE FITTING
- A522026 WASHER UPPER GAGE
- A555-001 GAGE SHIELD
- A522031 GAGE GLASS
- A522027 WASHER LOWER GAGE
- AA-958 GAGE BASE

Gauge Assembly A718-018

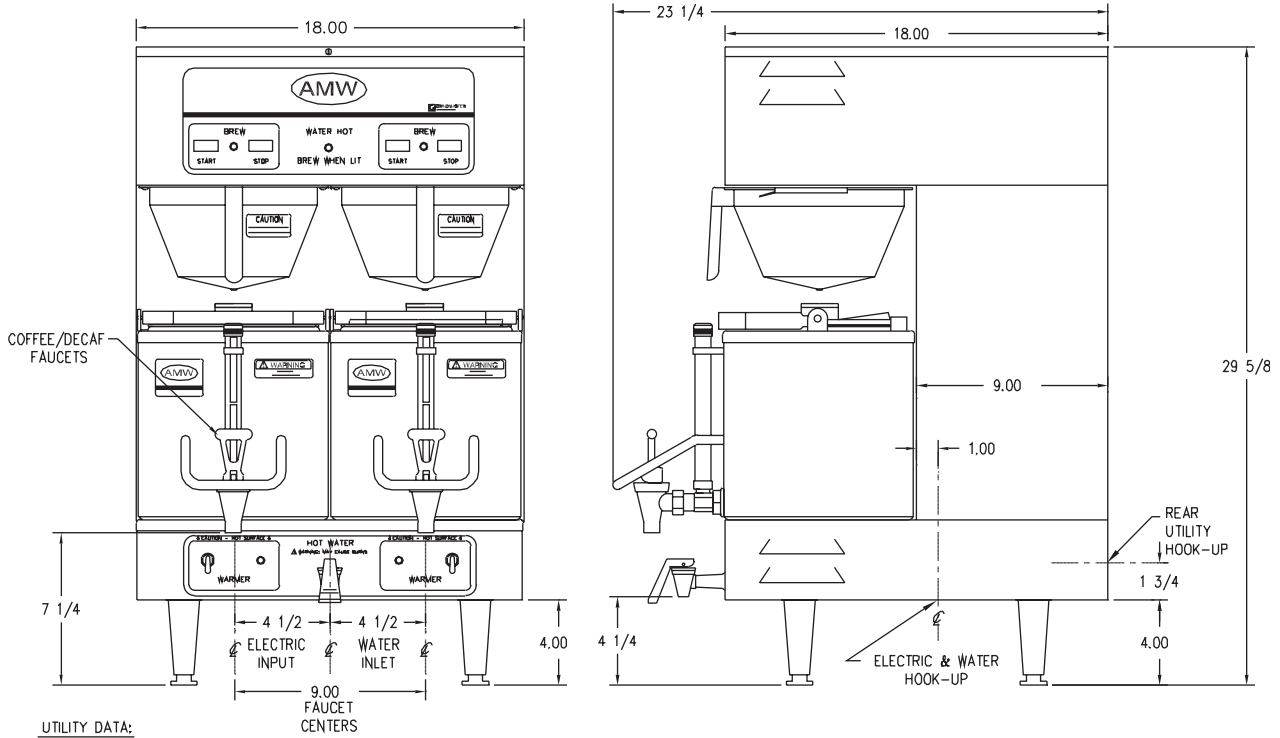
Rough-In Drawing for Model P-300



UTILITY DATA:
ELECTRIC
 6.6 KW 120/240 VOLT 1 PHASE 3 WIRE 28 AMPS
 OR 5 KW 120/208 VOLT 1 PHASE 3 WIRE 24 AMPS
 REAR OR BOTTOM HOOK-UP
WATER
 3/8" FLARE REAR OR BOTTOM HOOK-UP

NOTES:
 1. ALL DIMS ARE IN INCHES

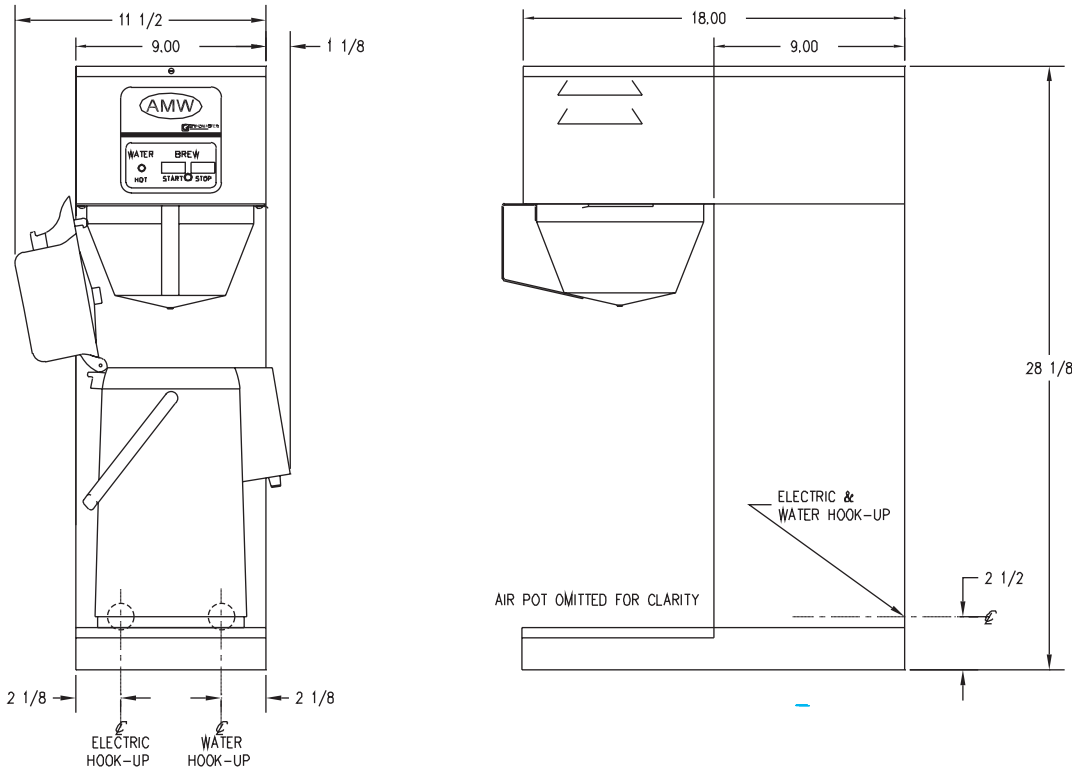
Rough-In Drawing for Model P-400 & P-400ESHP



UTILITY DATA:
ELECTRIC
 6.6 KW 120/240 VOLT 1 PHASE 3 WIRE 28 AMPS
 OR 5 KW 120/208 VOLT 1 PHASE 3 WIRE 24 AMPS
 REAR OR BOTTOM HOOK-UP
WATER
 3/8" FLARE REAR OR BOTTOM HOOK-UP

NOTES:
 1. ALL DIMS ARE IN INCHES

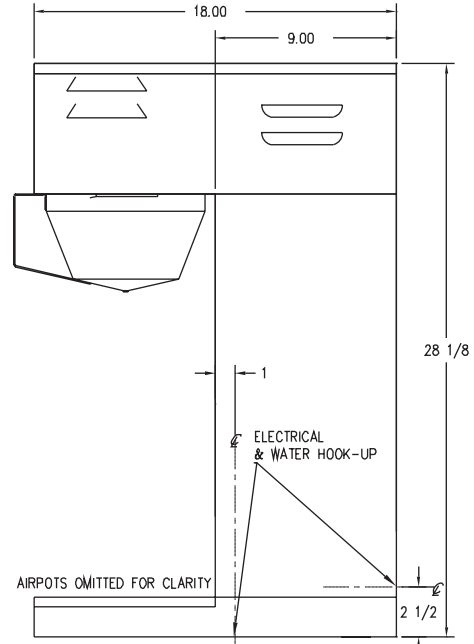
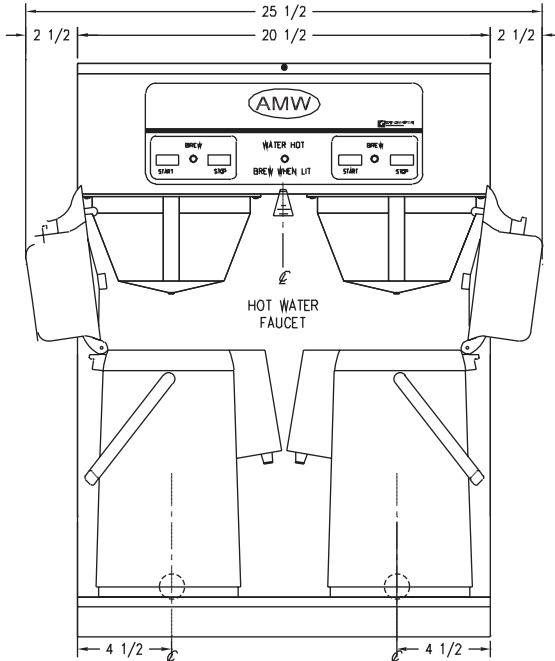
Rough-In Drawing for Model RAP-300



UTILITY DATA:
ELECTRIC
 6.6KW T20/240 VOLT 1 PHASE 3 WIRE 28 AMPS
 OR 5KW 120/208 VOLT 1 PHASE 3 WIRE 24 AMPS
 REAR HOOK-UP ONLY
WATER
 3/8" FLARE REAR HOOK-UP ONLY

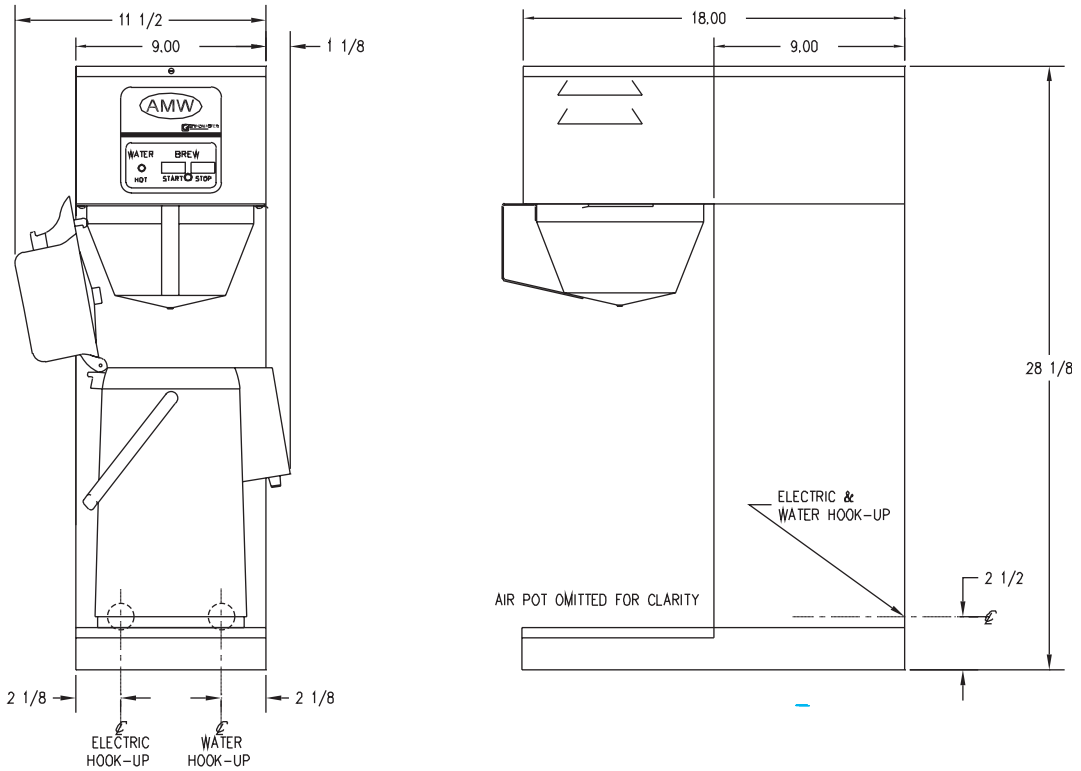
NOTES:
 1. ALL DIMS ARE IN INCHES

Rough-In Drawing for Model RAP-400



UTILITY DATA:
 ELECTRIC
 6.6KW 120/240 VOLT 1 PHASE 3 WIRE 28 AMPS
 OR 5KW 120/208 VOLT 1 PHASE 3 WIRE 24 AMPS
 REAR HOOK-UP ONLY (BOTTOM HOOK-UP WITH OPTIONAL 4" LEGS)
 WATER
 3/8" FLARE REAR HOOK-UP ONLY
 (BOTTOM HOOK-UP WITH OPTIONAL 4" LEGS)

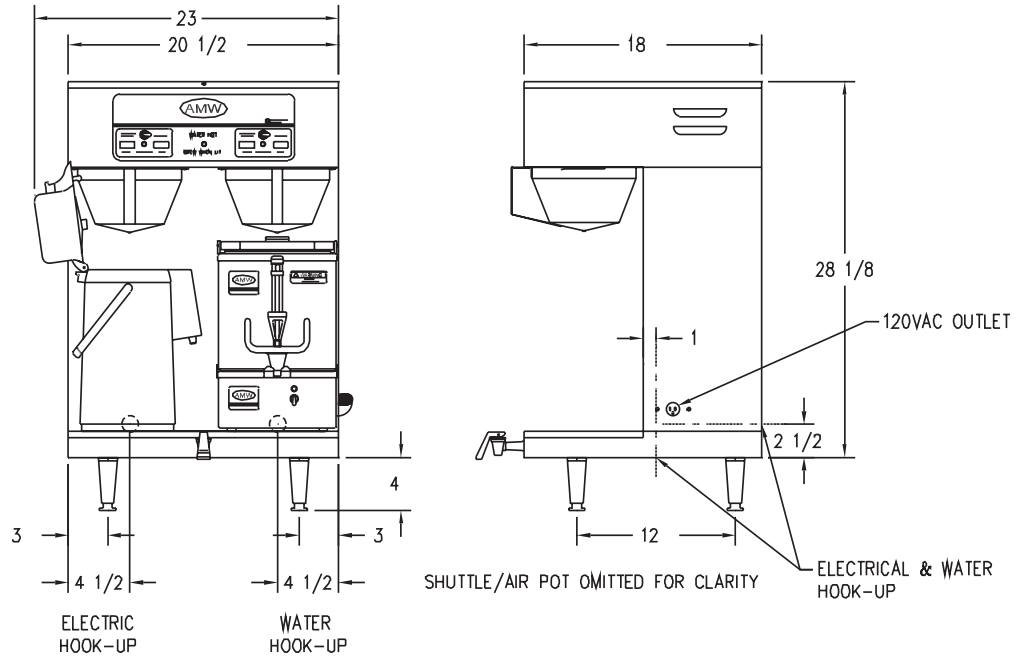
Rough-In Drawing for Model RAPS-300



UTILITY DATA:
ELECTRIC
 6.6KW T20/240 VOLT 1 PHASE 3 WIRE 28 AMPS
 OR 5KW 120/208 VOLT 1 PHASE 3 WIRE 24 AMPS
 REAR HOOK-UP ONLY
WATER
 3/8" FLARE REAR HOOK-UP ONLY

NOTES:
 1. ALL DIMS ARE IN INCHES

Rough-In Drawing for Model RAPS-400

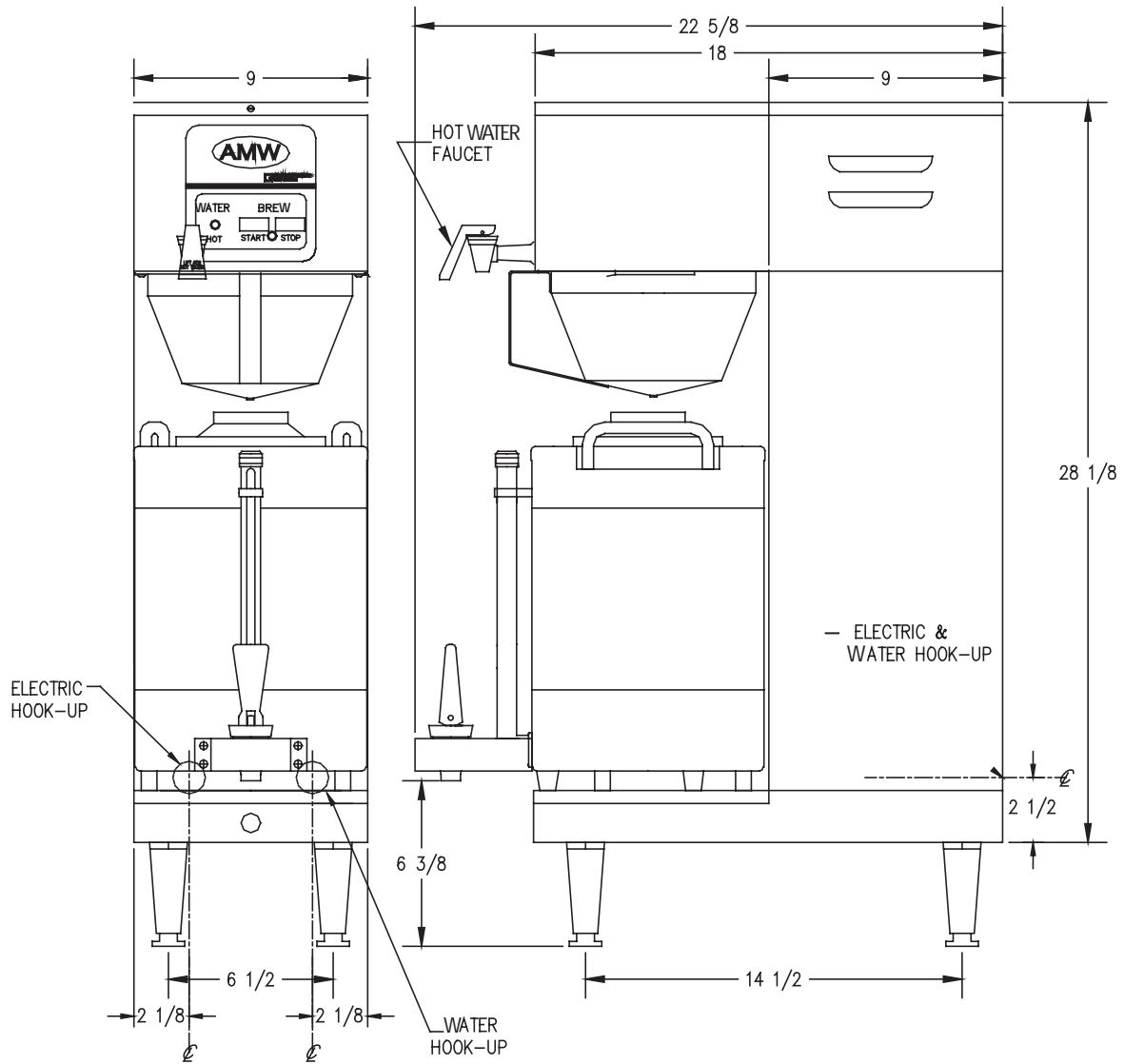


UTILITY DATA:

ELECTRIC
 5.7KW 120/240 VOLT 1 PHASE 3 WIRE 24 AMPS
 OR 4.5KW 120/208 VOLT 1 PHASE 3 WIRE 21 AMPS
 BOTTOM OR REAR HOOK-UP
WATER
 3/8" FLARE BOTTOM OR REAR HOOK-UP

NOTES:
 1. ALL DIMS ARE IN INCHES

Rough-In Drawing for Model VSB-300



UTILITY DATA:

ELECTRIC

6.6KW 120/240 VOLT 1 PHASE 3 WIRE 28 AMPS
 OR 5KW 120/208 VOLT 1 PHASE 3 WIRE 24 AMPS
 REAR HOOK-UP ONLY

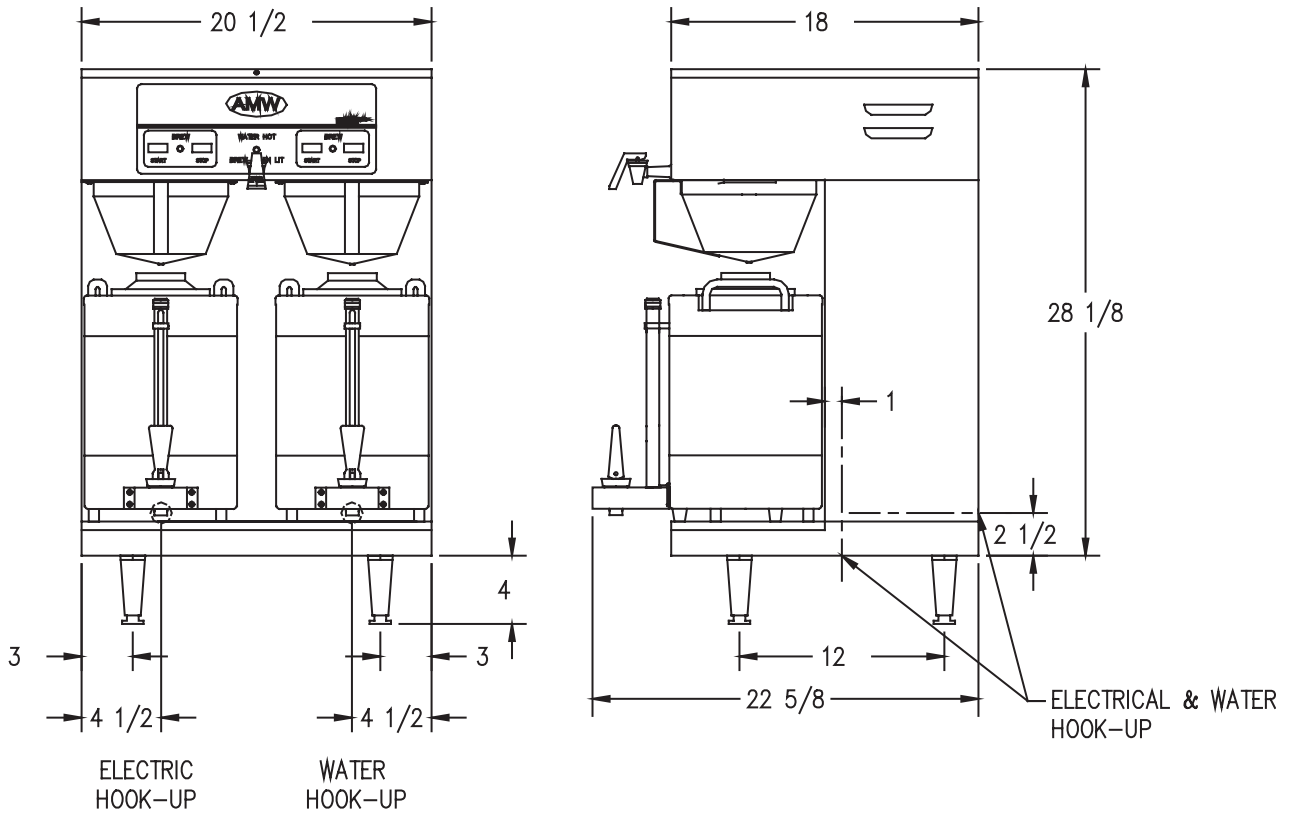
WATER

3/8" FLARE REAR HOOK-UP ONLY

NOTES:

1. ALL DIMS ARE IN INCHES

Rough-In Drawing for Model VSB-400



UTILITY DATA:

ELECTRIC

6.6KW 120/240 VOLT 1 PHASE 3 WIRE 28 AMPS
 OR 5KW 120/208 VOLT 1 PHASE 3 WIRE 24 AMPS
 BOTTOM OR REAR HOOK-UP

WATER

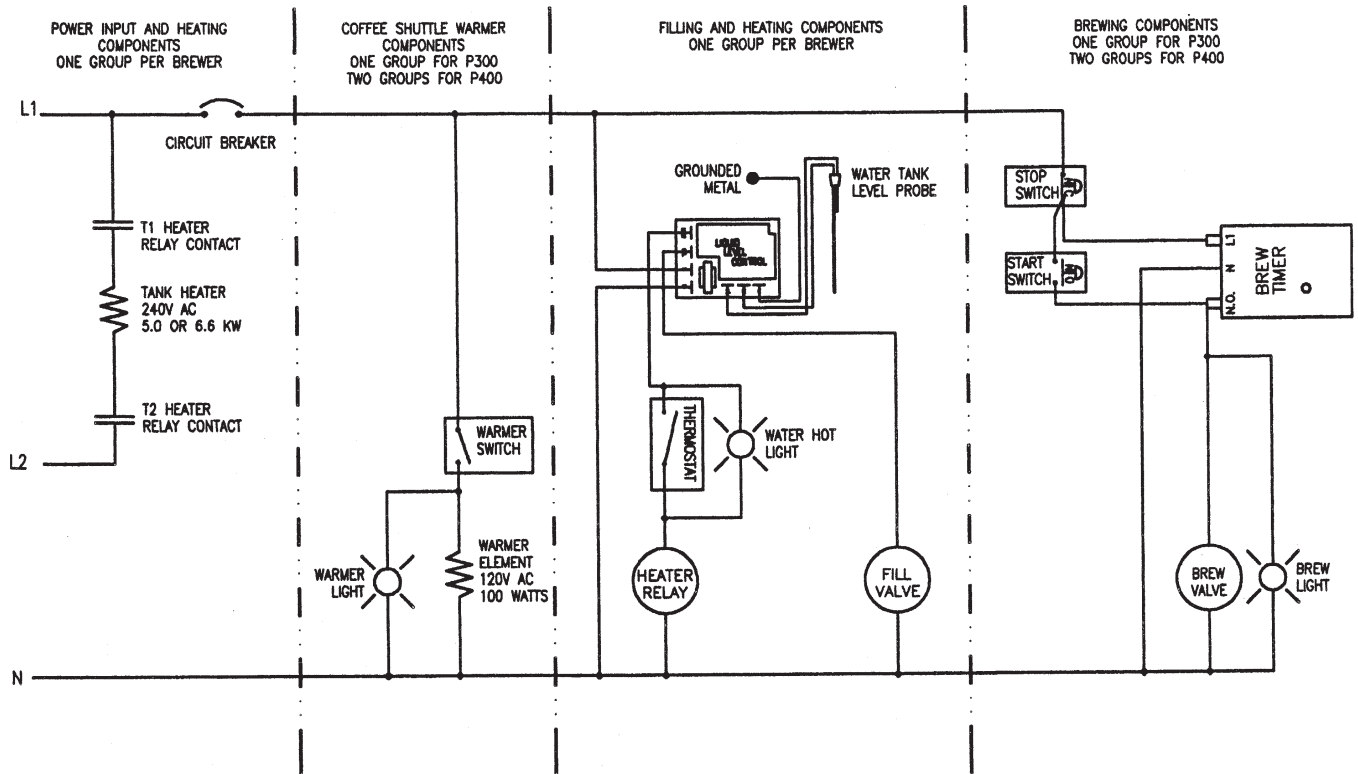
3/8" FLARE BOTTOM OR REAR HOOK-UP

NOTES:

1. ALL DIMS ARE IN INCHES

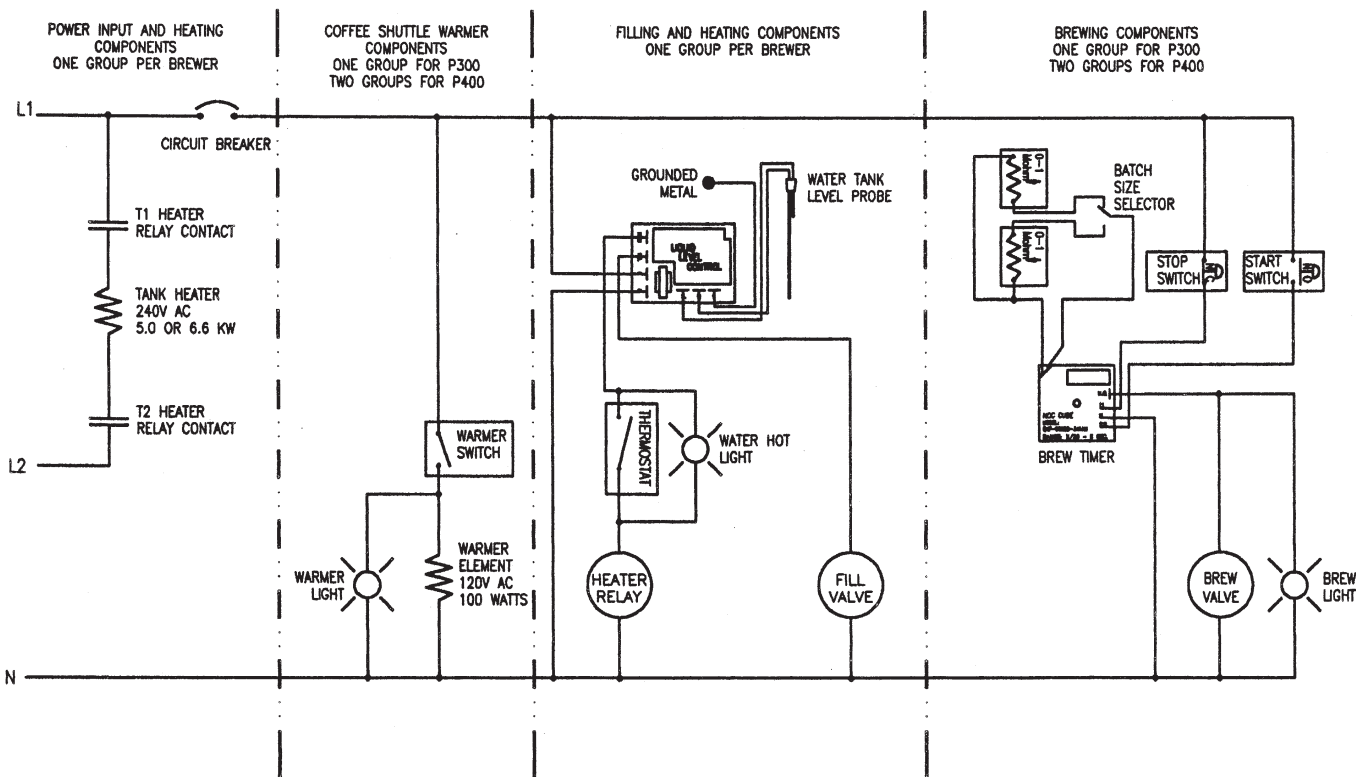
Wiring Diagram for P300E/P400E, with 1 Batch Timer

NOTE: THIS DRAWING SHOWS COMPONENTS ON STANDARD MODEL ONLY. SEE 091-548 FOR WIRING OF BREWER OPTIONS



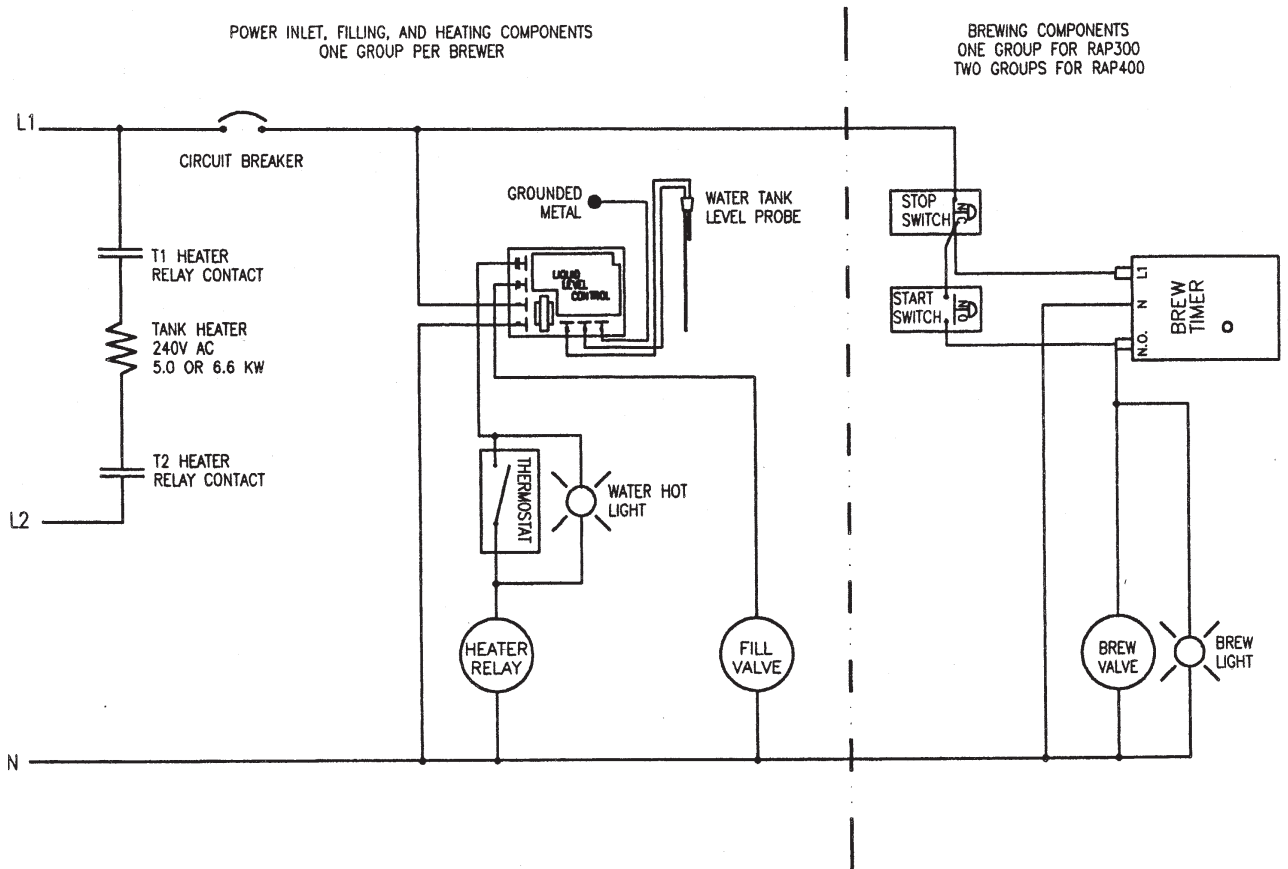
Wiring Diagram for P300E/P400E, with 2 Batch Timer

NOTE: THIS DRAWING SHOWS COMPONENTS ON STANDARD MODEL ONLY. SEE 091-548 FOR WIRING OF BREWER OPTIONS



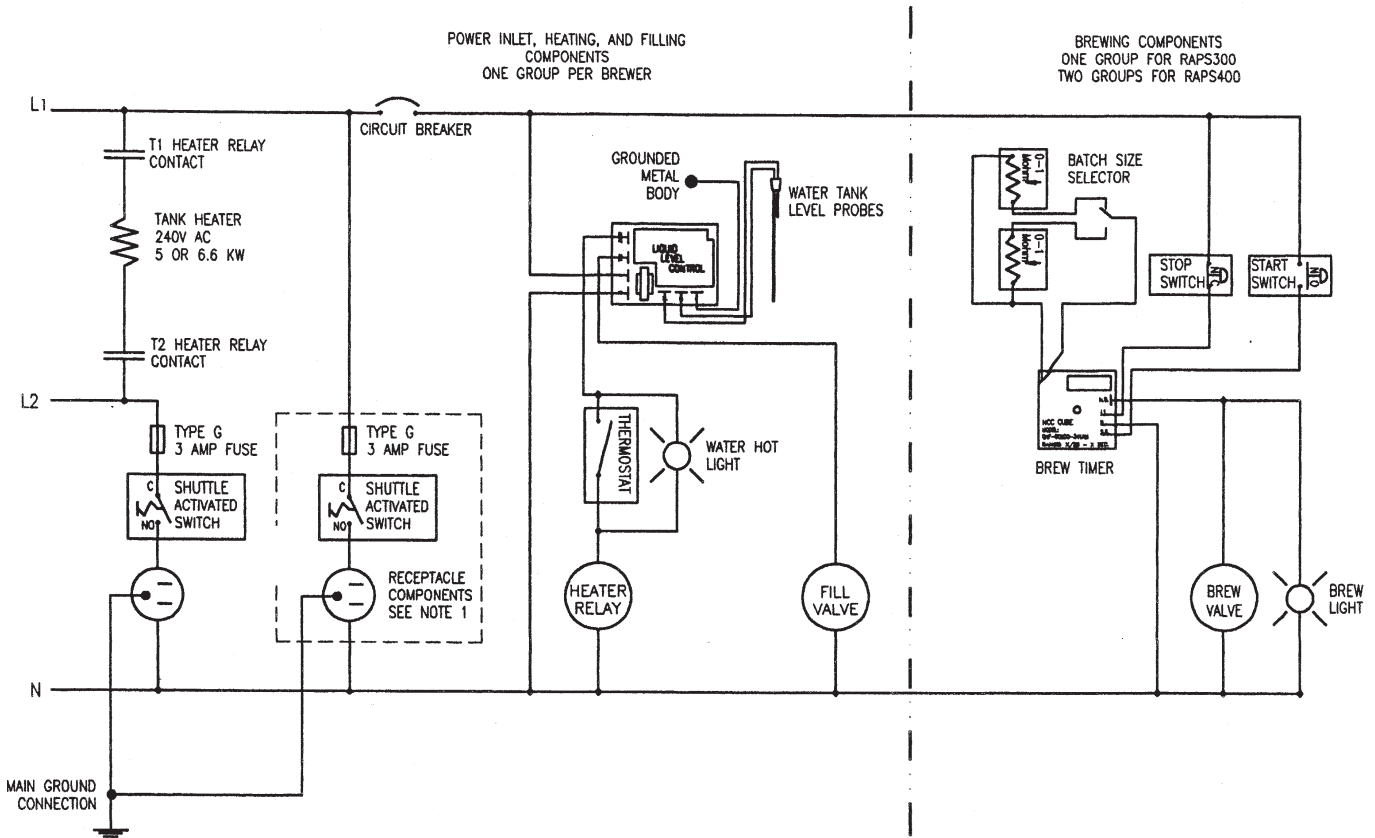
Wiring Diagram for RAP300E/400E

NOTE: THIS DRAWING SHOWS COMPONENTS ON STANDARD MODEL ONLY. SEE 091-548 FOR WIRING OF BREWER OPTIONS



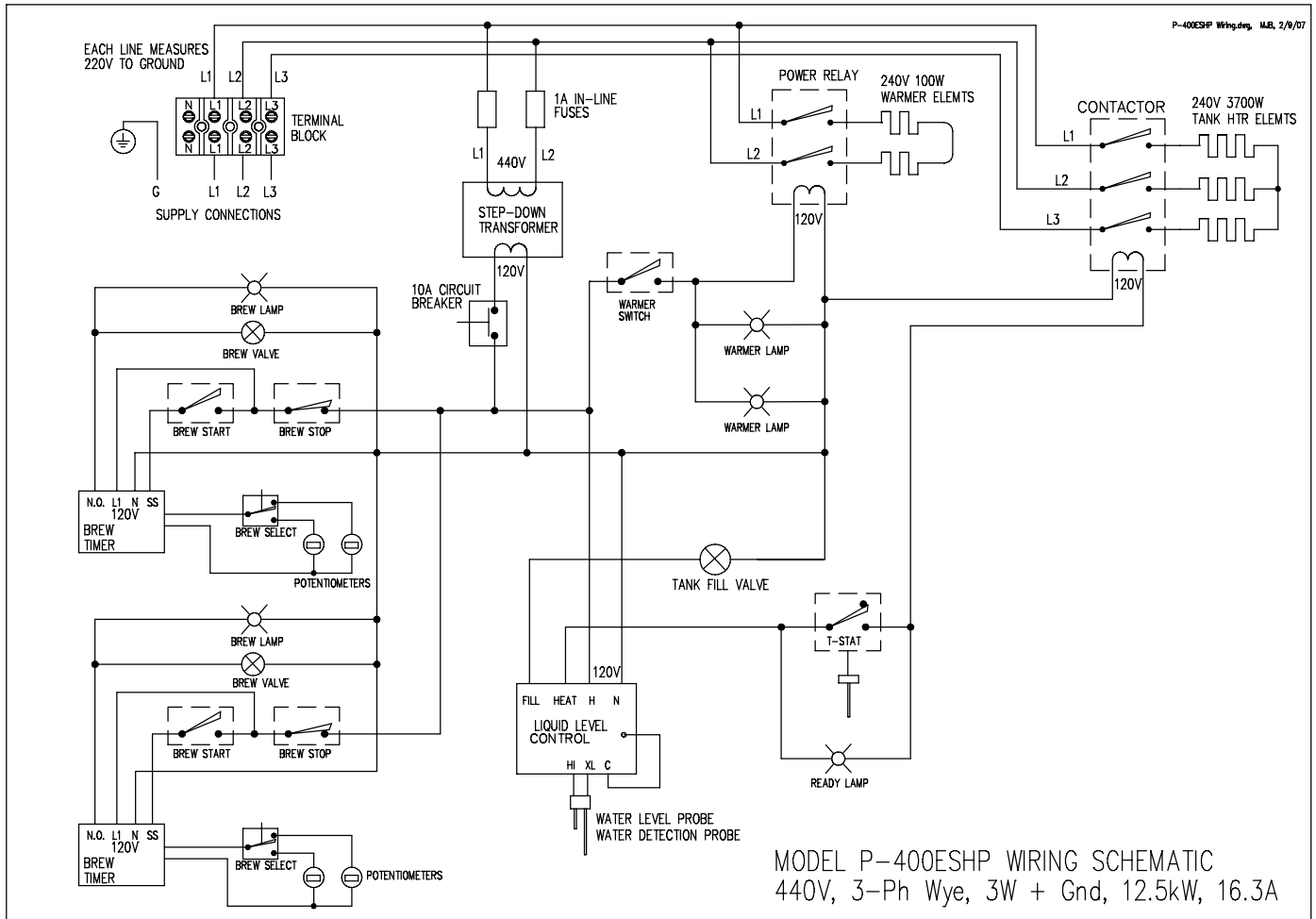
Wiring Diagram for RAPS 300/400E

NOTE:
 1) TWO SETS OF RECEPTACLE COMPONENTS ONLY PROVIDED ON TWIN RAPS400E MODEL. DELETE GROUP IN DASHED BOX FOR RAPS300E.
 2) THIS DIAGRAM SHOWS COMPONENTS ON STANDARD MODEL ONLY. SEE 091-548 FOR WIRING OF BREWER OPTIONS.



Drawing #091-523

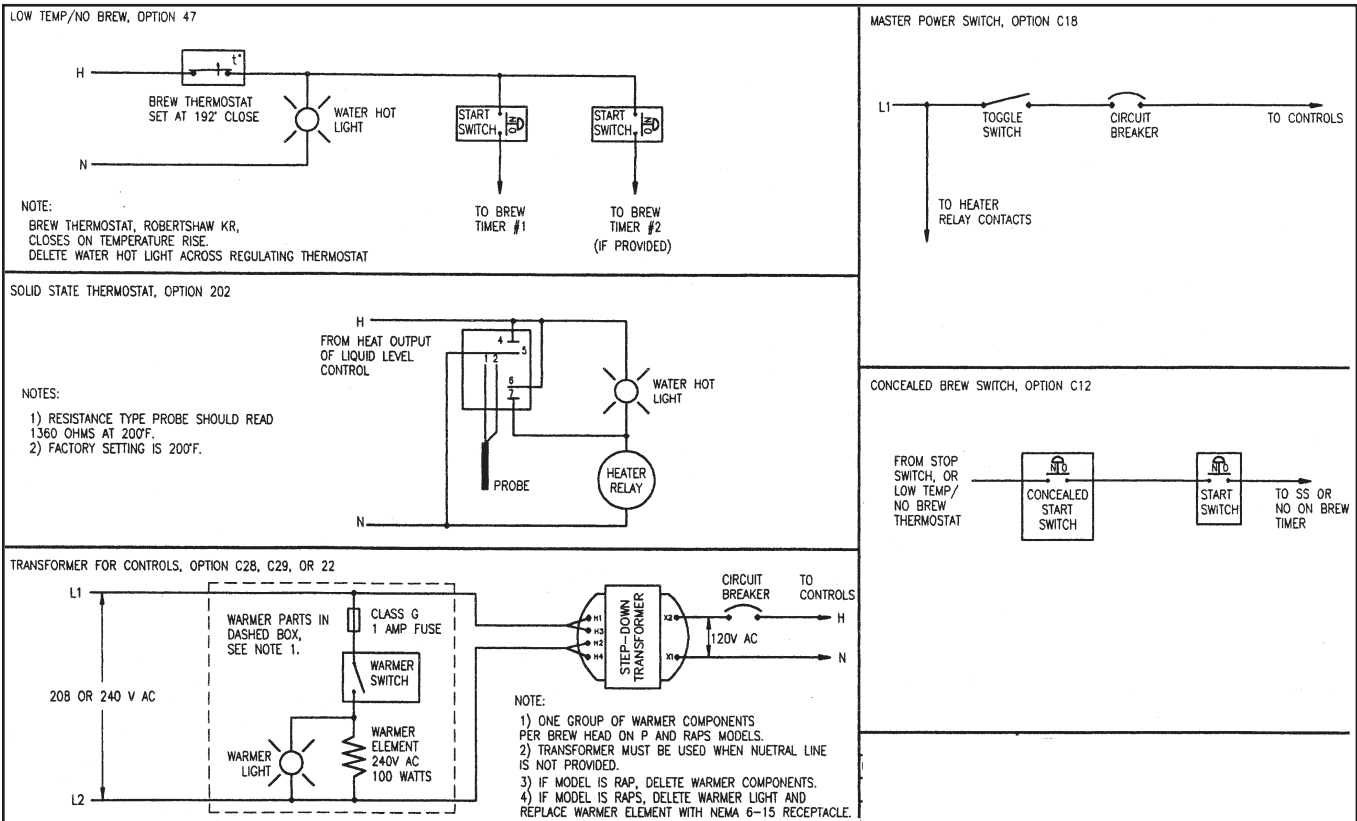
Wiring Diagram for P-400ESHP



Wiring Diagram #091-548

NOTE:

- 1) ONE GROUP OF WARMER COMPONENTS PER BREW HEAD ON P AND RAPS MODELS.
- 2) TRANSFORMER MUST BE USED WHEN NEUTRAL LINE IS NOT PROVIDED.
- 3) IF MODEL RAP, DELETE WARMER COMPONENTS.
- 4) IF MODEL IS RAPS, DELETE WARMER LIGHT AND REPLACE WARMER ELEMENT WITH NEMA 6-15 RECEPTACLE.



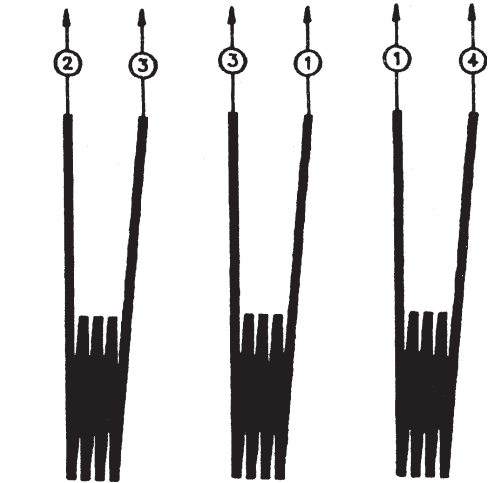
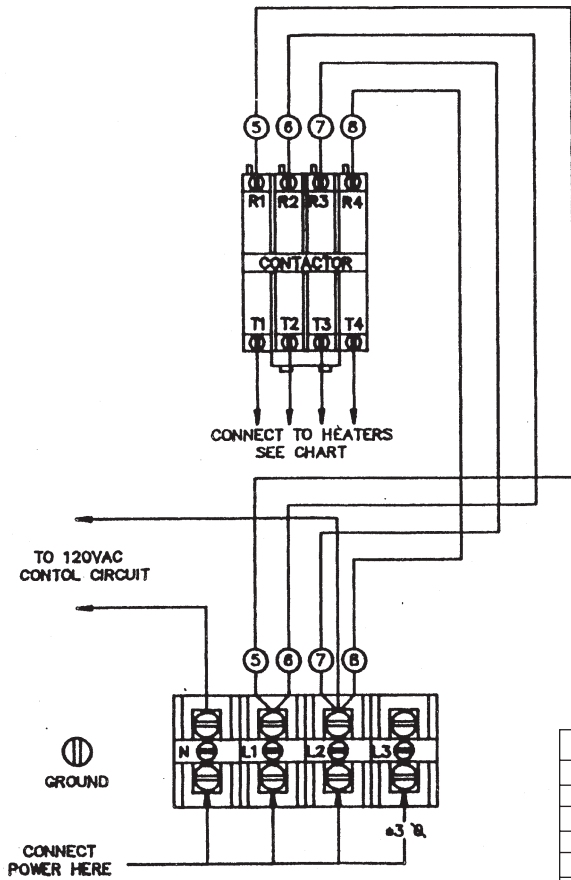
NOTES:

- 1) IF PROVIDED WITH OPTION C21A, THREE HEATERS, SEE HEATER WIRING DIAGRAM 091-182.
- 2) WHEN PROVIDED WITH OPTION C14, AUTOMATIC WARMER SHUTOFF, SUBSTITUTE ACTIVATED SWITCH FOR WARMER TOGGLE.

Wiring Diagram #091-182

NOTE: USE WIRE NUT FOR ① - ① CONNECTION

| | | | | | | |
|----|----|----|----|----|----|---|
| T3 | T3 | T3 | ① | ① | T4 | A |
| T2 | T3 | T3 | T4 | T4 | T4 | B |
| T2 | T3 | T3 | ① | ① | T1 | C |
| T3 | T3 | T3 | T1 | T1 | T4 | D |
| T2 | T3 | T3 | T1 | T1 | T4 | E |
| T2 | T3 | T3 | T1 | T1 | T2 | F |



5000 WATT / 240V HEATERS

| FOR THIS HEAT AND ELECTRIC SERVICE | WIRE PER FIG. |
|--|---------------|
| 2.0 KW - 120/208V - 1 PH - 3 WIRE - 9 AMPS | A |
| 2.5 KW - 120/240V - 1 PH - 3 WIRE - 11 AMPS | |
| 4.0 KW - 120/208V - 1 PH - 3 WIRE - 18 AMPS | B |
| 5.0 KW - 120/240V - 1 PH - 3 WIRE - 21 AMPS | |
| 5.5 KW - 120/208V - 1 PH - 3 WIRE - 27 AMPS | C |
| 7.5 KW - 120/240V - 1 PH - 3 WIRE - 31 AMPS | |
| 7.5 KW - 120/208V - 1 PH - 3 WIRE - 38 AMPS | D |
| 10.0 KW - 120/240V - 1 PH - 3 WIRE - 42 AMPS | |
| 11.5 KW - 120/208V - 1 PH - 3 WIRE - 54 AMPS | E |
| 15.0 KW - 120/240V - 1 PH - 3 WIRE - 63 AMPS | |
| 11.5 KW - 120/208V - 3 PH - 4 WIRE - 31 AMPS | F |
| 15.0 KW - 240V - 3 PH - 3 WIRE - 36 AMPS * | |

* SEPARATE 120V REQUIRED FOR CONTROLS (3 AMP LOAD)

* FOR 3 PHASE WIRING

1. MOVE WIRE ⑥ FROM L1 TO L3
2. CONNECT HEATER ACCORDING TO FIG. F ON CHART
3. FIG. F FOR 3 PH ONLY

WIRES ⑤⑥⑦⑧ ARE 8 AWG, 105°C

①②③④ ARE 10 AWG, 105°C



GRINDMASTER™

C O R P O R A T I O N

Grindmaster® Coffee Grinders and Brewers • PrecisionBrew™ Brewing Systems • Espresso® Espresso Machines
Crathco® Hot Beverage Dispensers • Crathco® Cold and Frozen Beverage Dispensers • AMW Coffee and Tea Systems
Tel (502) 425-4776 • Fax (502) 425-4664 • 1-800-695-4500 (USA & Canada only)

© Grindmaster Corporation, 1998
PRINTED IN USA

P.O. Box 35020 • Louisville, KY 40232 • USA
www.grindmaster.com • email: info@grindmaster.com

0307 Form # AM-309-08
Part # 090-077