Curtis®

$9.95

Diagnostics Guide.

for trained service personnel only

CONTENTS

INSTALLATION AND SETUP

ALL Curtis Systems Are Factory Pre-Set and Ready-to-Go for Normal Use.

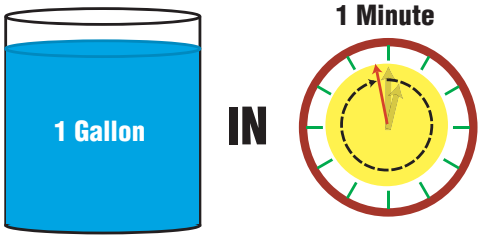
Generally there will not be a reason to change programming. However, should you need to make slight adjustments to meet your brewing needs, programming instructions are provided later in this manual.

System Requirements

- **Water Source: 20 – 100PSI/ Minimum Flow Rate of 1 GPM**

  Needle Valves and Self-Piercing Tap Valves (Saddle Valves) should NEVER be used.

  CAUTION: DO NOT connect to hot water. The inlet valve is not rated for hot water.



NOTE: For proper operation of units, one must ensure adequate water supply. This may be done by disconnecting the water supply hose at the rear of the unit. It must be able to fill a one gallon container in ONE minute or less. If it is unable to do this, a larger water supply line may be needed.

If connected to a water line that supplies other equipment, be sure the container can still be filled within ONE minute while the other equipment is drawing water.

Setup Steps

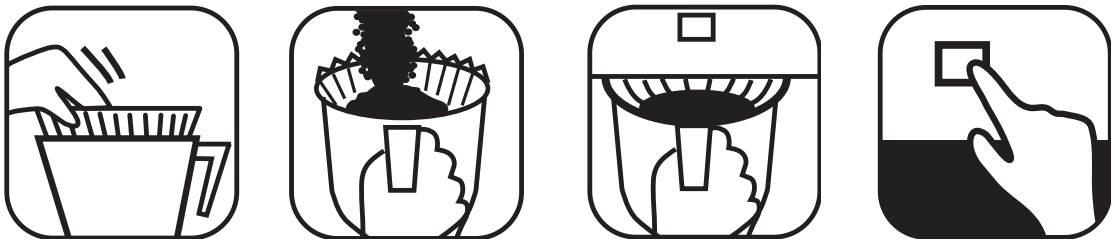
ALL coffee brewers, regardless of brand, should be level (left to right and front to back), and located on a solid counter top. Connect a water line from the water filter to the brewer. NOTE: Some type of water filtration device should be used to maintain a trouble-free operation. In areas with extremely hard water, we suggest that a sedimentary and taste and odor filter be installed (Model CSC10AC00 or CSC15AC00). It will prolong the life of your brewing system and enhance coffee quality. The top back panel of most brewers has two 8-32 x 1/2" screws to facilitate mounting the filter. (Not available on Alpha automatic and pour over.)

1. Use tubing of a size sufficient to provide a minimum of 1.0 GPM.
2. PURGE AIR from all water lines and filter cartridges by bleeding them into a bucket before connecting to unit. (Note: Air should also be purged when replacing filter cartridges.)
3. Connect the unit to an appropriate electrical power circuit. Refer to serial plate for voltage and amperage rating.
4. Turn on the toggle (STANDBY/ON) switch behind the unit. The heating tank will start to fill. When the water level in the tank rises to the correct volume, the heating elements will energize automatically. With our electronic system, there is no danger of element burnout caused by an empty tank at start-up.
5. The heating tank will require 10 to 30 minutes, depending on model, to attain set temperature as indicated by the READY-TO-BREW indicator.
6. Before brewing for the first time, dispense approximately12 ounces of hot water through the hot water faucet.
7. Run brew cycles of at least 12 ounces per side to purge the water lines of any air that may be trapped in the lines after filling.

THE NATIONAL SANITATION FOUNDATION REQUIRES THE FOLLOWING WATER CONNECTION:

1. A quick disconnect or additional coiled tubing (at least two times the depth of the unit) so that the machine can be moved for cleaning.
2. In some areas, an approved backflow prevention device may be required between the brewer and the water supply. (Check local plumbing codes.)

THE BASICS OF BREWING



GEMINI® and ThermoLogic™ Systems

WITHOUT AN INTERLOCK GRINDER

1. Brewer should be ON. (Confirm Rear Toggle Switch position, then press ON/OFF button.)
2. Place an empty Satellite or Thermo Server on the deck.
3. Place filter and ground coffee in brew cone. Position in brewing system.
4. Press the desired BREW BUTTON. Brewing will begin immediately.

WITH INTERLOCK GRINDER (SEE BELOW FOR INTERLOCK SET UP)

1. Brewer and grinder should be ON (Confirm rear toggle switch position, then press ON/OFF button.)
2. Place an empty Satellite or Thermo Server on the deck.
3. Position filter into brew cone and place in grinder.
4. Press desired grind Button – SMALL, MEDIUM or LARGE. (Allow the grinding motor to stop.) Brew selection is now "locked" into brewer, as indicated by steady "ON" brew lights.
5. Transfer brew cone from grinder to brewing system; press brew button. (If brewing is in process on both sides, the grinder will wait until one side is available before signaling brew cycle.)
6. Press the corresponding lighted BREW BUTTON. Brewing will begin immediately.

On InterLock Systems, you must first press grind BEFORE you are able to brew. When brewing portion pack coffees or pre-ground coffees, simply turn OFF the InterLock grinder to enable brewing.

INTERLOCK SET UP

Connecting the InterLock Grinder

1. Turn both units off.
2. Place the grinder close enough to the brewer that you can reach it with the InterLock cable.
3. Locate the jack, labeled INTERLOCK, on the back of brewer. Plug in the Interlock cable from the grinder.
4. Turn both units ON. InterLocking is complete.

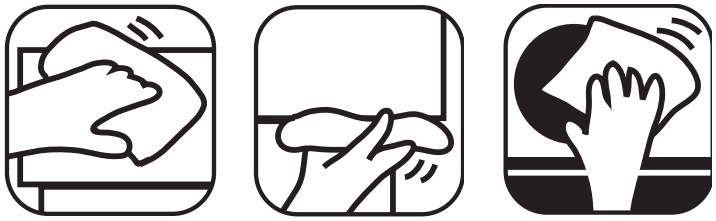
ALPHA, Airpot and TLP Systems

1. Brewer should be ON. (Set rear toggle switch to ON position. Press the ON/OFF switch on front panel.) Ready-to-Brew light should be on.
2. Position a DB-12 decanter or an Airpot below the brew cone.
3. Place filter and ground coffee in brew cone. Position in brewing system.
4. Press the BREW BUTTON. Brewing will begin immediately.

Tea Brewing Systems

1. Brewer should be ON. (Set rear toggle switch to ON position. Press the ON/OFF switch on front panel.) Ready-to-Brew light should be on.
2. Place a tea vessel (Curtis TCO or TC) below the brew cone.
3. Place filter and bulk tea in brew cone. Position in brewing system.
4. Press the BREW BUTTON. Brewing will begin immediately.

CARE AND MAINTENANCE



PREVENTIVE MAINTENANCE

1. Remove spray head from the brewer and clean it weekly (or more often in heavy lime areas.)
2. Periodic de-liming of heat tank by a qualified technician may be necessary, especially in areas with hard water. (Excessive lime buildup in heat tank may void warranty.)

CLEANING – IN ORDER TO MAINTAIN A NEW APPEARANCE AND TO ENSURE THE GOOD FLAVOR OF COFFEE OR TEA, THE BREWER SHOULD BE CLEANED DAILY.

1. Wipe off any spills, dust or debris from the exterior surfaces.
2. Clean the outside of the brewer, satellite, or tea container with stainless steel polish or warm, soapy water. Avoid coarse cleaning agents, as they will scratch the machine. Do not use bleach or any cleaner containing chlorine.
3. Clean inside the decanter or airpot with a Curtis cleaning brush (Model CAB-1 or JB-1) or SOFT scouring pad.
4. Slide out brew cone. Rinse thoroughly with clean water.
5. Remove the spray head and clean. Clean around the dome area, wiping with a nontoxic cleaner.
6. Clean the brew cone rails with a damp cloth or brush. Dry thoroughly with clean cloth.

PROGRAMMING ADS COFFEE SYSTEMS (PRE-G3)

ENTER THE PROGRAM MODE

For ALL Functions you must first enter the appropriate programming mode.

- *Turn OFF the power from the Control Panel by pressing ON/OFF.*
- *Press and HOLD BREW and Press and RELEASE ON/OFF.*

MODE #1

- *Continue HOLDING BREW until READY TO BREW STARTS blinking; RELEASE.*

MODE #2

- *Continue HOLDING BREW until READY TO BREW STOPS blinking; RELEASE.*

MODE #3

- *Continue HOLDING BREW until READY TO BREW STOPS blinking and REMAINS ON; RELEASE.*

IMPORTANT NOTE:

- *To enter programming on Gemini & ThermLogic Brewers you must: Confirm Sleep Mode ON or OFF. (Press ON/OFF; if Recovery light is OFF, Sleep Mode is disabled.*
- *Disable Sleep Mode. (Press and HOLD ON/OFF – while unit is ON – until Sleep Indicator light remain ON [enabled], or OFF [disabled])*
- *Enable Programming Tamper Switch on control board. Positon DOWN or LEFT to ON Position. (Lid of unit must be removed)*
- *On InterLock Systems, Grinder must be turned OFF.*

ADS ERROR CODES

ADS technology features a state-of-the-art Error Code System. This is designed to quickly advise you of any problems the system may experience expediting service or repair. Occasionally an error reported may be a problem with the water supply or electrical power, NOT directly associated with a fault of the Curtis System itself. An example of this includes:

• Clogged Water Filter – Indicated by a Water Level Error Code

Error Codes are indicated by READY TO BREW blinking a pattern as follows:

= Long Flash = Short Flash

– WATER LEVEL PROBLEM

– TEMPERATURE SENSOR PROBLEM

IMPORTANT

If unit goes into Error Code the Heating System, Water Inlet and Water Delivery System will ALL shut down.

Always confirm an Error Code a minimum of THREE TIMES to determine its cause.

CHANGE BREW VOLUME *(Factory Preset to Brewer Requirements)*

Enter the Programming Mode #1:

(CAUTION: Be sure to have brew cone and vessel in positon.)

- *Press and HOLD BREW until valve opens; then RELEASE.*

BY-PASS OPTION (Gemini, TL, TP Models): By-Pass is factory set for LARGE (36 cup) brew sizes only. By-pass is available on ALL brew sizes. By-Pass Operation – Enter Programming Mode #1

- *Press and HOLD BREW until valve opens. Continue holding until you hear a second valve (by-pass) open; then RELEASE.*
- *When desired volume is reached, press BREW again to stop the flow.*
- *To set and exit press ON/OFF.*
- *To Cancel By-Pass. Repeat above steps, except RELEASE when you hear the FIRST valve open. This cancels the By-Pass.*

CONFIRM/RESET BREW TEMP – Factory Set to 200° F

Enter the Programming Mode #1:

- *Press BREW for two seconds; then release*
- *READY TO BREW will start blinking. Each blink = 2° F, starting at 170° F. (Max 204°F – 18 Blinks)*
- *To CHANGE TEMPERATURE Press and HOLD BREW*
- *READY TO BREW will start QUICK Flashing. Each QUICK Flash adds 2°F. After reaching 204°F temperature starts over at 170°F.*
- *RELEASE BREW when the desired temperature is reached. The newly set temperature will now be displayed. To set and exit press ON/OFF.*

TO ACCESS PREVENTATIVE MAINTENANCE BREW CYCLE COUNTER

From the Programming Mode #2:

- *READY TO BREW will now start a PATTERN of LONG and SHORT blinks.*

This PATTERN identifies the number of brew cycles on the machine. SHORT blinks indicate the brew number from 1 to 9; LONG blinks separate 1's, 10's, 100's, 1,000's and 10,000's.

EXAMPLE

0003
0050
0100
2000

2153

PROGRAMMING ADS TEA SYSTEMS (PRE-G3)

ENTER THE PROGRAM MODE

For ALL Functions you must first enter the appropriate programming mode.

- *Turn OFF the power from the Control Panel by pressing* ON/OFF.
- *Press and HOLD* BREW *and Press and RELEASE* ON/OFF.

MODE #1

- *Continue HOLDING* BREW *until* READY TO BREW *STARTS blinking; RELEASE.*

MODE #2

- *Continue HOLDING* BREW *until* READY TO BREW *STOPS blinking; RELEASE.*

MODE #3

- *Continue HOLDING* BREW *until* READY TO BREW *STOPS blinking and REMAINS ON; RELEASE.*

ADS ERROR CODES

ADS technology features a state-of-the-art Error Code System. This is designed to quickly advise you of any problems the system may experience expediting service or repair. Occasionally an error reported may be a problem with the water supply or electrical power, NOT directly associated with a fault of the Curtis System itself. An example of this includes:

- *Clogged Water Filter – Indicated by a Water Level Error Code*

Error Codes are indicated by READY TO BREW ***blinking a pattern as follows:***

= Long Flash = Short Flash

– WATER LEVEL PROBLEM

– TEMPERATURE SENSOR PROBLEM

IMPORTANT

If unit goes into Error Code the Heating System, Water Inlet and Water Delivery System will ALL shut down. Always confirm an Error Code a minimum of THREE TIMES to determine its cause.

CHANGE BREW VOLUME *(With brew cone removed and vessel in position.)*

Enter the Programming Mode #1:

- *Press and HOLD* BREW *until valve opens; then RELEASE.*
- *When desired volume is reached, press* BREW *again to stop the flow.*
- *To set and exit press* ON/OFF.

DILUTION

Enter the Programming Mode #1:

- *Press and HOLD* BREW *until water starts flowing from Dilution Faucet; RELEASE.*
- *When desired volume is reached, Press* BREW. *This action sets the dilution volume and stops the flow. To set and exit press* ON/OFF.

DRIP MODE (DWELL TIME)

From the Programming Mode #3:

- READY TO BREW *will start blinking. Each blink equals 1 min. (max 10). The FIRST blink, if selected = 30 sec.*
- *To CHANGE TIME Press and HOLD* BREW. READY TO BREW *will start QUICK Flashing.*
- *RELEASE* BREW *when the desired time is reached. To set and exit press* ON/OFF.

CONFIRM/RESET BREW TEMP – Factory Set to 204° F

Enter the Programming Mode #1:

- *Press* BREW *for two seconds; then release*
- READY TO BREW *will start blinking. Each blink = 2°F, starting at 170°F. (Max 204°F – 18 Blinks)*
- *To CHANGE TEMPERATURE Press and HOLD* BREW
- READY TO BREW *will start QUICK Flashing. Each QUICK Flash adds 2°F. After reaching 204°F temperature starts over at 170°F.*
- *RELEASE* BREW *when the desired temperature is reached. The newly set temperature will now be displayed. To set and exit press* ON/OFF.

TO ACCESS PM BREW CYCLE COUNTER

From the Programming Mode #2:

- READY TO BREW *will now start a PATTERN of LONG and SHORT blinks. This PATTERN identifies the number of brew cycles on the machine. SHORT blinks indicate the brew number from 1 to 9; LONG blinks separate 1's, 10's, 100's, 1,000's and 10,000's.*

PROGRAMMING ADS PRIMO CAPPUCCINO SYSTEMS (PRE-G3)

PRIMO CAPPUCCINO

CHANGING THE POWDER/WATER RATIO – Factory Preset to 100% (Ratio should be determined by powder mfg.)

Enter the Program Mode by Pressing and HOLDING ANY TWO Buttons until Lights START Blinking; RELEASE.

- *Press and HOLD the selected* PUSH *for approximately 1 second, until the light starts blinking; then RELEASE.*
- *The number of blinks = the Powder/Water Ratio setting. 1 = 10%; 10 = 100%.*
- *To CHANGE, Press and HOLD* PUSH *. Each QUICK Flash increases the ratio by 10%, starting over after 100%.*
- *Release* PUSH *when the desired ratio is reached. To set and exit, Press ANY OTHER .* PUSH

CHANGING THE DISPENSING MODE – Factory Preset to Manual

To Set Portion Control Dispensing: (CAUTION: Be sure to have cup in position.)

- *Enter the Program Mode by Pressing and HOLDING ANY TWO Buttons until Lights START Blinking; RELEASE.*
- *Press and HOLD the selected* PUSH *until liquid STARTS to flow; then RELEASE.*
- *When the desired volume is reached Press* PUSH *again. (Note: Stop flow at 3/4 full). This action sets the Portion Volume and exits the Program Mode.*

To Set Manual Free-Flow Dispensing: (CAUTION: Be sure to have cup in position.)

- *Enter the Program Mode by Pressing and HOLDING ANY TWO Buttons until Lights START Blinking; RELEASE.*
- *Press and HOLD the selected* PUSH *until liquid STARTS to flow. Continue HOLDING until it STOPS; RELEASE.*
- *This action sets the Manual Free-Flow Dispensing and exits the Program Mode.*

PROGRAMMING ADS SLEEP MODE AND WARMER/QUALITY TIMER (PRE-G3)

SLEEP MODE is an energy-saving feature that, when enabled, works as follows:

Two hours AFTER the last brew the system will reduce energy to the heating tank, allowing the temperature to "normalize" at 140°F. – effectively saving energy. Sleep Mode is indicated by the "sleep" light on the front control panel.

There are two ways to WAKE the system from Sleep Mode:

1. Press the ON button.

The recovery light will flash and proper brewing temperature will be indicated by the "Ready-to-Brew" light. (This may take up to 20 minutes.)

2. Press the BREW button.

The recovery light will flash rapidly, and when proper brewing temperature has been reached, the system will begin

IMPORTANT
Gemini GEM-600ILD, GEM-612ILD, GEM-12D and ThermoLogic TL-9001, TL 9002 SLEEP MODE must be DISABLED to allow Programming.

SLEEP MODE

To ENABLE Sleep Mode:

- *UNIT MUST BE ON. Press and HOLD* ON/OFF *until* ▶ **SLEEP** *light turns ON; Press* ON/OFF *again. Sleep Mode is now ENABLED.*

To DISABLE Sleep Mode:

- *UNIT MUST BE ON. Press and HOLD* ON/OFF *until* ▶ **SLEEP** *light turns OFF; Press* ON/OFF *again. Sleep Mode is now DISABLED.*

WARMER QUALITY TIMER – Factory Preset to DISABLED

To Determine Warmer Setting and Change Quality Timer for GEMINI Systems:

- *WARMER MUST BE OFF. Press and HOLD* WARMER *until the light turns ON then goes OFF; RELEASE.*
- *The light will start blinking. Count the blinks.*
  Each blink = 20 minutes (maximum 200 min.).
  NOTE: On ALPHA Models each blink = 5 minutes (max. 50 min.)
- *At the end of the cycle, Press and HOLD* WARMER *until the light begins QUICK Flashing. The cycle will start over after 11 Flashes.*
  (NOTE: A setting of 11 Flashes is the DISABLED Position).
- *When the desired time is reached, RELEASE* WARMER *.*
- *To set and exit press* ON/OFF *.*

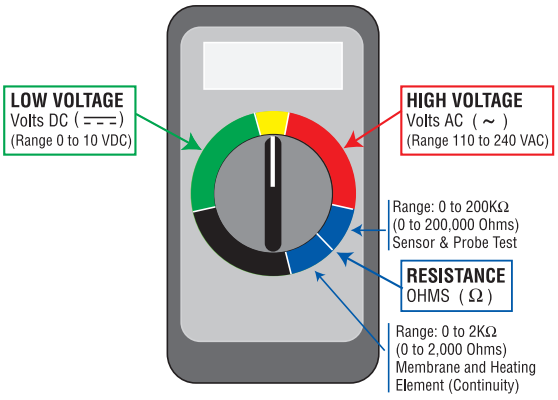
NOTE: Depending on heat setting, power may be "pulsed" to warmer.

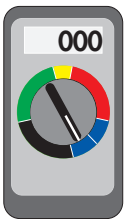
DIAGNOSTIC BLOCKS AND TROUBLESHOOTING ADS SYSTEMS (PRE-G3)

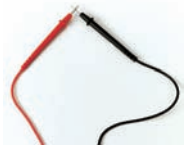
Basic knowledge of electrical circuits and test equipment is required. Caution should always be used whenever servicing equipment because of high voltages and hot water. In addition to common hand tools, the following are recommended:

The Digital Multi-Tester

Depending on your multi-tester (analog or digital), you must select the appropriate range for each test. The range must contain the value the multi-tester is to read. ALL scales are "0" to "X," where x = the upper range on the scale you have selected.







In order to test for continuity, your multi-tester must be set to a low resistance (Ohm) scale. This is typically 0 to 2K**Ω**. While touching the two probe tips together, the meter will read approximately "000". This indicates continuity or "zero" resistance.

The following four items describe the operation and diagnostic method for the major control systems on Pre-Generation 3 models:

1. Control Board
2. Temperature Sensor
3. Water Level Probe
4. Membrane Switch Face Panel

1. CONTROL BOARD

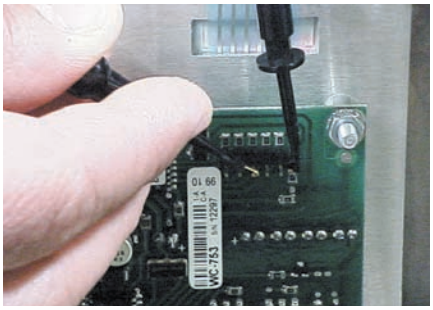
Each unit has a digital control board that controls all functions of the system. Primo Cappuccino™ machines have two boards: a control board in the door behind the membrane switch and a water level/heat control board in the left side cover. The three-phase GEMINI® series brewers have a second, three-phase control board (Opto-board) under the Triac heat sink assembly. Some models have a board mounted Triac that is not user serviceable, and some have a remote heat sink mounted Triac which is replaceable.

NOTE: Digital electronics have an extremely high reliability rate. It is imperative that a technician always find the root cause of a defective control or power board. For example, if a load such as a warmer shorted to ground, the board mounted Triac could fail. If the short is not determined before replacing the board, a second board may fail. Each connection sub-system should be checked for electrical integrity before replacing digital boards.

TESTING THE CONTROL BOARDS

NOTE: Always make provisions for the capture of hot water from spray heads, faucets and dispensers.

1. Turn OFF the circuit breaker or disconnect the power to the brewer. CAUTION: Switching machine toggle switch to standby does not shut off power to unit.
2. Remove cover(s) of the unit and check all connections to the board.
3. Visually inspect the control board for obvious burn marks or defects. Shorts in burners, valves, heaters and motors will typically cause the small board mounted Triacs to fail. All domestic boards operate on 120 VAC. If the metal oxide varistor (MOV) has blown, it is likely that connection to a 220 VAC or a high voltage spike has occurred. The MOV is designed to protect the board against such "dirty" power.
4. Restore power to the unit.
5. If the control board will not switch ON after you press the membrane switch, carefully disconnect the ribbon connector from the control board exposing the male prongs on the face of the board.



6. With a small tipped probe set or any piece of insulated wire, securely connect to the common prong, then momentarily touch the ON/OFF pin to turn the unit ON (as shown). (Refer to Table 1, on p. 13 for proper pinout locations.)
7. After the unit turns on and lights up, you can test the functions by connecting between the appropriate prongs. If you are assured that the power to the board is correct and jumping does not turn the unit on, the board may need replacement or there may be a problem with the wiring harness.
8. For units utilizing board mounted Triac (G1), test for voltage at heater connection under load to assure Triac operation. This must be done with water below set temperature. Just before the tanks reaches temperature, the heater is pulsed with power to maintain tank temperature to within a few degrees. These pulses vary from a few seconds to a few minutes; this is normal. This control is extremely energy efficient and operates differently from an analog unit.

9. If jumping membrane connector pins on the board does not turn the unit ON, verify that there is power to the board. This is accomplished by using the appropriate schematic for the unit being serviced (See Table 1, p. 13). Line voltage should be present on the board connectors or plugs. Once power to the board is verified, the membrane switch should be turned on.

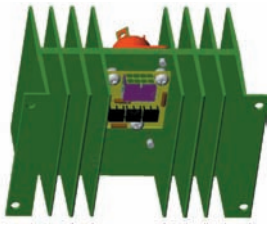
10. For remote Triac, first make sure that connections to Triac are correct (refer to wire diagram), then remove the gate connector and measure AC voltage between the gate connector and L1 at the power block. With the tank full (probe wet) and unit ON (tank below set temperature), you should read line voltage (see photo). If you do not the board may have malfunctioned and need to be replaced.

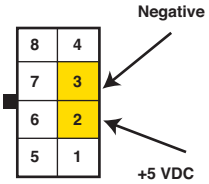
AC Volts

11. For three-phase models, you must first disconnect the Opto-board wiring harness connector on the back side of the heat sink Triac assembly (see illus.). Set your multi-tester to a scale which will read 5 Volts DC. With the tank full (probe wet) and unit ON (tank below set temperature), you should read 5 Volts DC between pin 2 and pin 3 (see diagram). If not, the board may have malfunctioned and may need to be replaced.

DC Volts

Illus.





Diagram

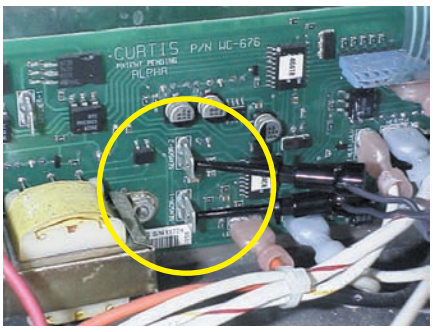
12. Control valves and whipper motors receive line voltage while "ON." This must be verified with the multi-tester.

13. Warmers receive line voltage while "ON". The voltage, however, is pulsed to control heat. On "HIGH" setting, voltage is constant. On "MEDIUM" and "LOW" settings, voltage is pulsed.

14. Auger motors in cappuccino machines are pulsed quickly to control dispensing. This is difficult to read with a multitester. However, if voltage is present while in the dispense mode, this system is working properly.

15. To test the sensor/heat control section of the control board, jump the sensor connector at the board (G1), or at the pigtail connection (G2) as shown. The ready-to-brew light should come on, and the power to the heater should go off.

Sensor Terminals



G1 Models

Sensor Terminal Quick Disconnect

G2 Models

TABLE 1

EACH CONTROL BOARD CONNECTOR HAS A COMMON ON ONE SIDE.

When testing, use the following guidelines:

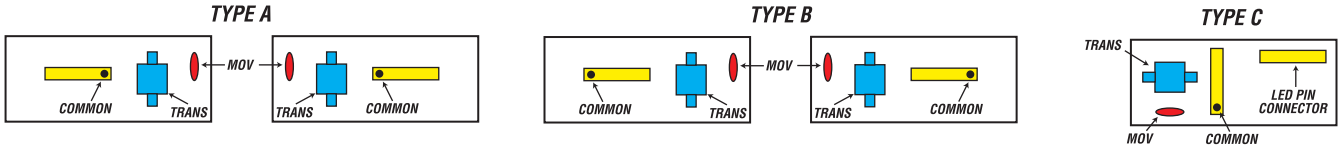
Membrane Connector Pin Location: C123456 or 654321C where "C" is the common and the "number" is the pin.
NOTE: Pin #1 is always adjacent to the "C" common.

Wiring Harness Connector Models: Line voltage is measured across "L1" and "N.".

Individual connection models: Line voltage is measured across "black" (L1) and "white" (neutral).

MEMBRANE SWITCH (Touch Pad) PIN REFERENCE

MODEL	COMMON	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10
GEM 612ILD	A	Hot Water	LG Brew (R)	MD Brew (R)	SM Brew (R)	Warmer (R)	Warmer (L)	LG Brew (L)	MD Brew (L)	SM Brew (L)	ON/OFF
GEM 12D	A	Hot Water		Brew (R)		Warmer (R)	Warmer (L)		Brew (L)		ON/OFF
GEM 600ILD	A	Hot Water	Warmer	LG Brew	MD Brew	SM Brew	ON/OFF				
TL9002	A	Hot Water	LG Brew (R)	MD Brew (R)	SM Brew (R)		LG Brew (L)	MD Brew (L)	SM Brew (L)	ON/OFF	
TL9001	A	Hot Water		LG Brew	MD Brew	SM Brew	ON/OFF				
ILGD	A	ON/OFF	Small (R)	Medium (R)	Large (R)	Small (L)	Medium (L)	Large (L)			
D500	B	Brew	ON/OFF								
D1000	B	ON/OFF	Brew (L)	Brew (R)							
TCTD, PTTD	B	Brew	ON/OFF								
ALPHA D, DS	B	ON/OFF	Brew	Warmer	Warmer	Warmer					
PC1	B	Wash	Dispense 1								
PC2	B	Wash	Dispense (R)	Dispense (L)							
PC3	B	Wash	Dispense 3	Dispense 2	Dispense 1						
PC4	B	Wash	Dispense 4	Dispense 3	Dispense 2	Dispense 1					
TLP	C	ON/OFF	Full Brew	1/2 Brew	Hot Water						



2. TEMPERATURE SENSOR

If you suspect that your unit is not heating properly or if your ready-to-brew light indicates an error code, (three long blinks and whether short blinks), you can test the heating tank sensor to see whether it is working properly.

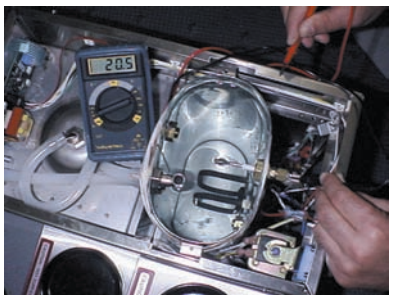
TESTING THE SENSOR:

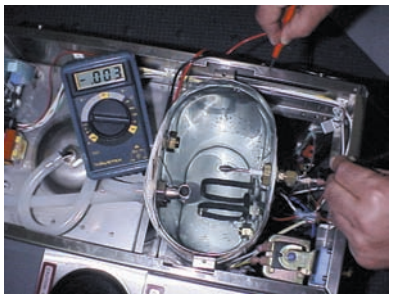
1. Turn OFF the circuit breaker or disconnect the power to the brewer. CAUTION: Switching machine toggle switch to standby does not shut off power to unit.
2. You will need to set your multi-tester on a scale that will read 0 – 200,000 ohms (0 – 200KΩ).
3. Remove the thin white sensor wires from the board at terminals or male/female connection. Insert tester probes into sensor wire end terminals. Readings should fall approximately within the temperature/resistance ranges in the Sensor Resistance chart below. If not, replace or check the connection.
4. If the sensor tests good, you should then check the mounting of the sensor to tank, making sure that it is snug and that there is white heat transfer compound (Part WC5231) between the tank and the flat portion of the sensor.

SENSOR RESISTANCE RANGE

3. WATER LEVEL PROBE

If your unit is overflowing, not filling correctly, or if your ready-to-brew light indicates an error code (three long blinks and one short blink), check to make sure that the wiring to the probe is tight and installed fully on the probe. Inspect the probe in the tank for lime, debris, and excessive pitting. If found, replace the probe.



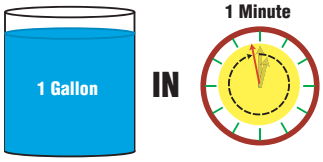


TESTING THE PROBE

1. Turn OFF the circuit breaker or disconnect the power to the brewer. CAUTION: Switching machine toggle switch to standby does not shut off power to unit.
2. With the unit off and unplugged and water in the tank contacting the probe, disconnect the orange probe wire and measure between the probe connector tip and the chassis. The resistance should be less than 100KΩ (100,000 ohms). If it is higher, the probe may need to be replaced or cleaned.

3. With the orange wire connected to the probe, the unit ON and at temperature. Set the multi-tester on a scale to read 5 volts DC. Touch one lead to the unit probe connector, and the other to the chassis. Then either brew or draw water so that the level falls below the probe and then refills back to the probe. The reading should be low voltage DC changing from positive to negative as the water touches the probe each time.

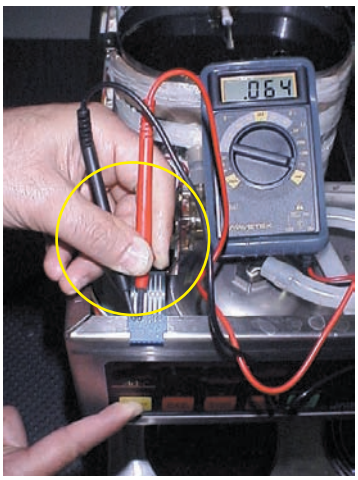
NOTE: For proper operation of the units, one must ensure an adequate water supply. This may be done by disconnecting the water supply hose at the rear of the unit. It must be able to fill a one gallon container in ONE minute or less. If it is unable to do this, a larger water supply line may be needed.



4. MEMBRANE SWITCH FACE PANEL

If any of the membrane buttons, (ON/OFF, WARMER or BREW), do not respond when pressed, you may have a defective membrane panel. You may test the membrane panel by performing the following test procedure.

TESTING THE MEMBRANE:



1. Turn OFF the circuit breaker or disconnect the power to the brewer.
   CAUTION: Switching machine toggle switch to standby does not shut off power to the unit.
2. To check the continuity of each switch, disconnect the ribbon cable and touch the leads of your multi-tester about 1/2" from the end of the ribbon connector where the silver connection is exposed (see photo). Often, there is dielectric compound present; a thin probe, however, will penetrate the compound.

TIP: Free up both hands by using tape to hold the ribbon connector to the chassis.

DC Volts (⎓)

NOTE: The probe tips of the multi-tester must be pressed firmly into the ribbon connector's silver connection area to ensure a proper reading.

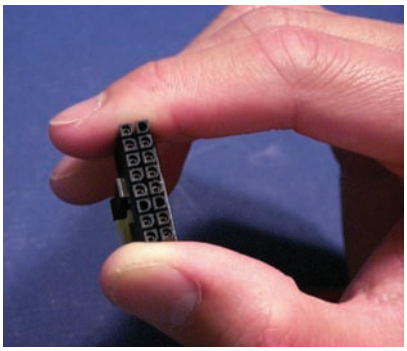
3. Use Table 1 (p. 13) to verify the operation of each switch. Set the multi-tester on a scale that will read 200Ω (200 ohms) or less. Measure across the common and appropriate membrane switch pin. Each switch should have a resistance of 100Ω (100 ohms) or less while pressed and held.
4. Next, test each pin across the common without pressing the membrane switch. There should be no readings.
5. With your multi-tester set to a scale to read 2KΩ (2,000 ohms), you must also check each connection to the chassis ground. There should be no readings. NOTE: Do NOT press membrane switches unless placed on a flat surface. Doing so may damage the membrane switch.

COMPONENT – RESISTANCE REFERENCE CHART

PRODUCT LINE	*HEATING ELEMENT*	*TEMPERATURE SENSOR (Ambient)*	*LEVEL PROBE (Wet)*
ALPHA BREWING SYSTEMS			
ALPHA-D/DS/DD	9 to 12Ω	5k to 180kΩ	30k to 100kΩ
AIRPOT BREWING SYSTEMS			
D500	9 to 12Ω	5k to 180kΩ	30k to 100kΩ
D1000AP	15 to 20Ω	5k to 180kΩ	30k to 100kΩ
GEMINI BREWING SYSTEMS			
GEMINI-600/TL9001	20 to 25Ω	5k to 180kΩ	30k to 100kΩ
GEM612ILD/TL9002	20 to 25Ω	5k to 180kΩ	30k to 100kΩ
GEM12D	20 to 25Ω	5k to 180kΩ	30k to 100kΩ
PRIMO CAPPUCCINO			
CAPPUCCINO (PCD)	8 to 10Ω	5k to 180kΩ	30k to 100kΩ
TEA BREWING SYSTEMS			
TCTD/PTTD	8 to 10Ω	5k to 180kΩ	30k to 100kΩ
THERMOLOGIC LOW PROFILE			
TLP	8 to 10Ω	5k to 180kΩ	30k to 100kΩ
MISCELLANEOUS ITEMS			
PC WHIPPER MOTOR	50 to 150Ω		
GEAR MOTOR	5 to 20Ω		
TLP PUMP	5 to 20Ω		
EXTRACTOR FAN			10 to 50Ω

TABLE 2 – ADS WIRING HARNESS/PIN CALLOUT FUNCTIONS

CAUTION – HIGH VOLTAGE



GEM-612ILD & TL-9002

20	10	1	GND GRINDER	11	SIGNAL GRINDER
19	9	2	GND CHASSIS	12	N/A
18	8	3	N (NEUTRAL)	13	N/A
17	7	4	BREW VALVE (R)	14	PROBE
16	6	5	BREW VALVE (L)	15	SENSOR
15	5	6	BYPASS VALVE (L)	16	SENSOR
14	4	7	WARMER (L)	17	INLET VALVE
13	3	8	TRIAC RETURN	18	BYPASS VALVE (R)
12	2	9	TRIAC GATE	19	HOT WATER VALVE
11	1	10	L1	20	WARMER (R)

GEM-12D

16	8	1	WARMER (L)	9	WARMER (R)
15	7	2	HOT WATER VALVE	10	L1
14	6	3	BREW VALVE (R)	11	N (NEUTRAL)
13	5	4	BREW VALVE (L)	12	GND CHASSIS
12	4	5	INLET VALVE	13	OPTO-BOARD 3ϕ ON
11	3	6	TRIAC RETURN	14	PROBE
10	2	7	TRIAC GATE	15	SENSOR
9	1	8	OPTO-BOARD 3ϕ GND	16	SENSOR

TL-9001 & GEM-600-ILD

16	8	1	IL CONNECTOR	9	N/A
15	7	2	IL CONNECTOR	10	WTR LEVEL PROBE
14	6	3	GND	11	TEMP SENSOR
13	5	4	N (NEUTRAL)	12	TEMP SENSOR
12	4	5	BREW VALVE	13	INLET VALVE
11	3	6	BYPASS VALVE	14	TRIAC
10	2	7	L1	15	HOT WATER VALVE
9	1	8	WARMER ELEMENT	16	GATE TRIAC

OPTO-BOARD PINS

8	4	1	RETURN GATE 1	5	GATE 1
7	3	2	HOT WATER VALVE	6	RETURN GATE 2
6	2	3	GND OPTO-BOARD	7	GATE 2
5	1	4	GATE 3	8	RETURN GATE 3

TCTD & PTTD

12	6	1	L1	7	TRIAC RETURN
11	5	2	N (NEUTRAL)	8	TRIAC GATE
10	4	3	TEMP SENSOR	9	DILUTION
9	3	4	TEMP SENSOR	10	HOT WATER
8	2	5	GND	11	PROBE
7	1	6	N/A	12	N/A

D1000

12	6	1	TRIAC GATE	7	N/A
11	5	2	TRIAC RETURN	8	N/A
10	4	3	N (NEUTRAL)	9	DUMP VALVE (R)
9	3	4	TEMP SENSOR	10	DUMP VALVE (L)
8	2	5	TEMP SENSOR	11	INLET VALVE
7	1	6	PROBE	12	L1

D500

12	6	1	L1	7	TRIAC RETURN
11	5	2	N (NEUTRAL)	8	TRIAC GATE
10	4	3	TEMP SENSOR	9	INLET VALVE
9	3	4	TEMP SENSOR	10	DUMP VALVE
8	2	5	GND	11	PROBE
7	1	6	N/A	12	N/A

ALPHA DS & DD

16	8	1	L1	9	TRIAC RETURN
15	7	2	N (NEUTRAL)	10	TRIAC GATE
14	6	3	N/A	11	N/A
13	5	4	W-R	12	PROBE
12	4	5	W-F	13	GND CHASSIS
11	3	6	W-B	14	INLET VALVE
10	2	7	BREW VALVE	15	SENSOR
9	1	8	N/A	16	SENSOR

ILGD GRINDER

12	6	1	MOTOR (L)	7	L1
11	5	2	MOTOR (R)	8	N/A
10	4	3	TRIAC GATE	9	N/A
9	3	4	TRIAC A1	10	N/A
8	2	5	INTERLOCK	11	N/A
7	1	6	INTERLOCK	12	N (NETURAL)

DIAGNOSTIC BLOCKS AND TROUBLESHOOTING G3 SYSTEMS

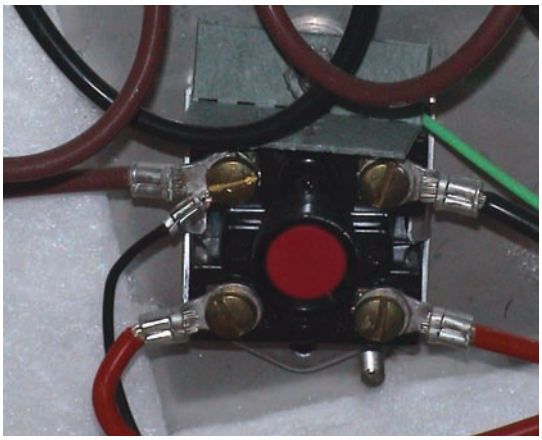
THE DIAGNOSTIC BIG THREE

1. AVOID ASSUMING TOO QUICKLY THAT THE BOARD IS THE PROBLEM..

2. BREW "NORMALIZE" (RUN) THREE TIMES BEFORE MAKING ANY PROGRAM CHANGES.

3. FIND THE ROOT CAUSE.

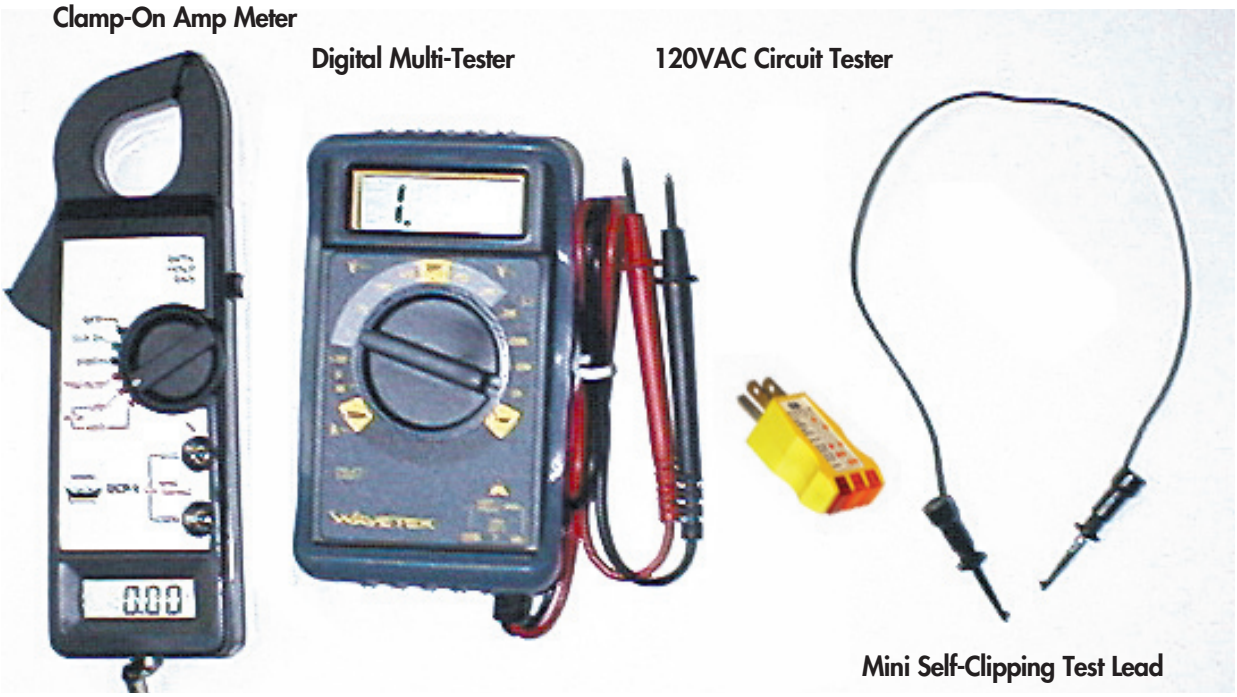
IMPORTANT



A. Most equipment comes equipped with a mechanical high-limit reset thermostat mounted on the hot water tank. Be sure that this is reset by depressing the red button.

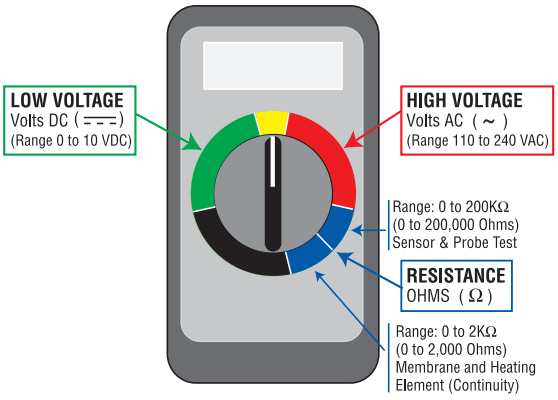
B. The ADS equipment also comes with an X2 capacitor on the power block for line voltage filtration and protection of the control boards. These are to be used on the L1 to neutral only. If the X2 capacitor looks burnt, replace it.

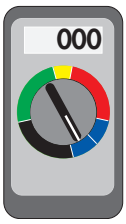
Basic knowledge of electrical circuits and test equipment is required. Caution should always be used whenever servicing equipment because of high voltages and hot water. In addition to common hand tools, the following are recommended:

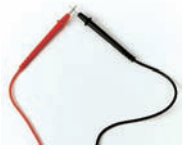


The Digital Multi-Tester

Depending on whether your multi-tester is analog or digital, you must select the appropriate range for each test. The range must contain the value the multi-tester is to read. ALL scales are "0" to "X," where x = the upper range on the scale you have selected.





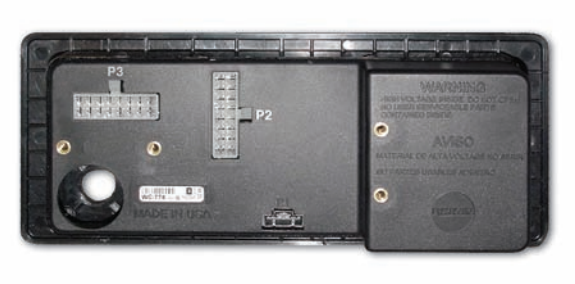


In order to test for continuity, your multi-tester must be set to a low resistance (Ohm) scale. This is typically 0 to 2K**Ω**. While you are touching the two probe tips together, the meter will read approximately "000". This indicates continuity or "zero" resistance.

CURTIS Generation 3 (G3) Electronic Control Systems must use the following diagnostic procedures for troubleshooting.

The control modules contain no user serviceable parts. It is important that each sub-system in the unit be known good. This process of Testing each sub-system through the wiring harness connector and specific components will ensure the proper operation of the components. This method will allow diagnosis of the unit and, by process of elimination, tell whether the controller or a specific component needs replacing.

1. Universal Control Module (UCM)



2. Hybrid Micro Controller (HMC)

3. Universal Power Module (UPM)

Control Modules

Each G3 unit has a digital control (UCM or HMC) that controls all the functions of the system. Primo Cappuccino™ machines have two controls: a UCM in the door and a UPM in the left side cover mounted vertically below the whipper motor. All three-phase brewers have a second, three-phase control board (Opto-Board) under the Triac heat sink assembly. Newer three-phase brewers feature a solid state relay (SSR) without the Opto-Board.

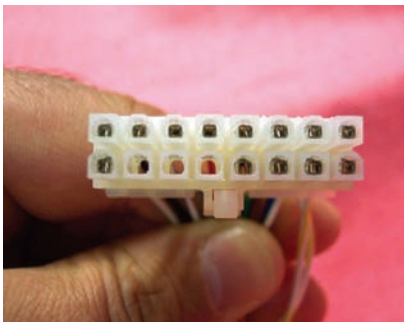
NOTE: Digital electronics have an extremely high reliability rate. It is imperative that a technician always find the root cause of a defective control or power board. For example, if a load such as a warmer shorted to ground, the board mounted Triac could fail. If the short is not determined before replacing the board, a second board may fail. Each connection sub-system must be checked for electrical integrity before replacing digital boards.

Testing the Control Modules

REFER TO THE MODEL SPECIFIC "FIVE MINUTE DIAGNOSTIC AND TROUBLESHOOTING GUIDE."

TABLE 3 – G3 WIRING HARNESS/PIN CALLOUT FUNCTIONS

CAUTION – HIGH VOLTAGE



PCGT UPM P1 Molex

16	8
15	7
14	6
13	5
12	4
11	3
10	2
9	1

1 120VAC HOT (BLK)
2 120VAC HOT (BLK)
3 INLET VALVE (BRN)
4 120VAC NEUTRAL
5 TRIAC RETURN
6 TRIAC GATE
7 GEAR MOTOR 5
8 DUMP VALVE 5
9 DUMP VALVE 1
10 GEAR MOTOR 1
11 DUMP VALVE 2
12 GEAR MOTOR 2
13 DUMP VALVE 3
14 GEAR MOTOR 3
15 DUMP VALVE 4
16 GEAR MOTOR 4

PCGT UPM P2 Molex

12	6
11	5
10	4
9	3
8	2
7	1

1 N/A
2 N/A
3 N/A
4 N/A
5 TEMP SENSOR
6 TEMP SENSOR
7 WATER LEVEL PROBE
8 WATER LEVEL GND
9 UCM DATA
10 UCM GND
11 UCM vdd (+)
12 UCM vss (-)

PCGT 1, 2, 3, 4, 5 UCM

8	4
7	3
6	2
5	1

1 UCM DATA
2 UCM GND
3 UCM vss (-)
4 UCM vdd (+)
5 120VAC NEUTRAL
6 N/A
7 N/A
8 120VAC HOT

PCGT 4, 5 Membrane Connector

4
3
2
1

1 Com L
2 Dispense L
3 Com R
4 Dispense R

HMC 25 MICRO CONTROLLER

14	7
13	6
12	5
11	4
10	3
9	2
8	1

1 WATER LEVEL PROBE
2 WATER LEVEL GND
3 SW/LED
4 LOGIC GND
5 SW/LED
6 SW/LED
7 PWR LED/CPU vdd (+)
8 INLET VALVE
9 TEMP SENSOR
10 TEMP SENSOR
11 120VAC HOT
12 120VAC NEUTRAL
13 TIMER/BREW VALVE
14 RESERVED

TEA BREWER (TCT/PTT)

16	8
15	7
14	6
13	5
12	4
11	3
10	2
9	1

1 DILUTION VALVE
2 N/A
3 SWEETENER VALVE (OPT)
4 INLET VALVE
5 BREW VALVE
6 TRIAC GATE
7 TRIAC RETURN
8 120VAC HOT
9 TEMP SENSOR
10 TEMP SENSOR
11 GROUND
12 WATER LEVEL PROBE
13 N/A
14 N/A
15 NC
16 120VAC NEUTRAL

COMBO BREWER (CBS/CBP)

16	8
15	7
14	6
13	5
12	4
11	3
10	2
9	1

1 N/A
2 N/A
3 DILUTION VALVE
4 INLET VALVE
5 BREW VALVE
6 TRIAC GATE
7 TRIAC RETURN
8 120VAC HOT
9 TEMP SENSOR
10 TEMP SENSOR
11 GROUND
12 WATER LEVEL PROBE
13 SAFETY SWITCH NC
14 SAFETY SWITCH NO
15 NC
16 120VAC NEUTRAL

GEM Twin/Single; THERMOPRO Twin/Single
(w/Triac or Solid State Relay [SSR])

20	10
19	9
18	8
17	7
16	6
15	5
14	4
13	3
12	2
11	1

1 GRINDER
2 COMMON - Opto Board and Grinder
3 +5VDC
4 SOLENOID LOCK R
5 SOLENOID LOCK L
6 INLET VALVE
7 BYPASS VALVE R
8 WARMER L
9 WARMER R
10 BYPASS VALVE L
11 SENSOR WARMER R
12 SENSOR WARMER L
13 SENSOR TANK
14 SENSOR COMMON
15 GROUND CHASSIS
16 WATER LEVEL PROBE
17 120VAC NEUTRAL
18 120VAC HOT
19 BREW VALVE RIGHT
20 BREW VALVE LEFT

OPTO BOARD

8	4
7	3
6	2
5	1

1 TRIAC #1 RETURN
2 +5VDC
3 COMMON
4 NA
5 TRIAC #1 GATE
6 TRIAC #2 RETURN
7 TRIAC #2 GATE
8 NA

CAFE AUTOMATIC and TLP Switch Board

4	2
3	1

1 BREW (HMC Pin 3)
2 ON/OFF (HMC Pin 5)
3 COMMON (HMC Pin 4)
4 N/A (HMC Pin 6)

ALPHA GT and D500 GT

16	8
15	7
14	6
13	5
12	4
11	3
10	2
9	1

1 WARMER BOTTOM
2 WARMER FRONT
3 WARMER REAR
4 INLET VALVE
5 BREW VALVE
6 HEATER TRIAC GATE
7 TRIAC RETURN
8 120VAC HOT
9 TEMP SENSOR
10 TEMP SENSOR
11 WATER LEVEL GND
12 WATER LEVEL PROBE
13 N/A
14 N/A
15 N/A
16 120VAC NEUTRAL

D1000 GT

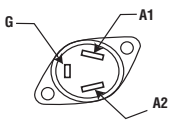
16	8
15	7
14	6
13	5
12	4
11	3
10	2
9	1

1 N/A
2 N/A
3 BREW VALVE LEFT
4 INLET VALVE
5 BREW VALVE RIGHT
6 TRIAC, GATE
7 TRIAC RETURN
8 120VAC HOT
9 TEMP SENSOR
10 TEMP SENSOR
11 COMMON, TANK STUD
12 WATER LEVEL PROBE
13 N/A
14 N/A
15 N/A
16 120VAC NEUTRAL

MERCURY GT

16	8
15	7
14	6
13	5
12	4
11	3
10	2
9	1

1 N/A
2 N/A
3 N/A
4 INLET VALVE
5 HEATER CONTACT COIL
6 N/A
7 N/A
8 L1 HOT, 220VAC
9 TOP LIQUID LEVEL
10 N/A
11 COMMON, TANK STUD
12 BOTTOM LIQUID LEVEL
13 SAFETY SWITCH, C
14 SAFETY SWITCH, NO
15 N/A
16 L2 HOT, 220VAC



N/A: Not Apply

APPENDIX:

OVERVIEW OF ELECTRICITY AND WATER CONNECTIONS

The following section provides a fundamental overview of electricity (voltage, resistance, current, and power) and the importance of an adequate water connection. As always, caution should be used whenever servicing equipment because of high voltages and hot water.

THE CONCEPT OF ELECTRICAL VALUES

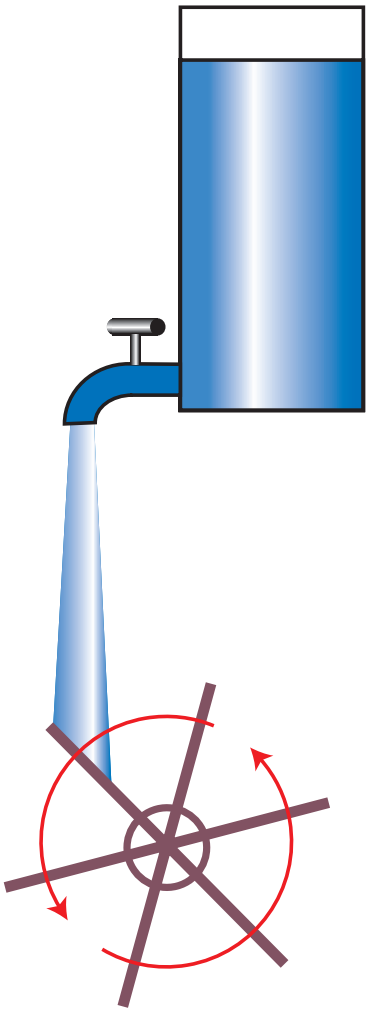
Water Level (VOLTAGE)

Faucet (RESISTANCE)

Fully Open = 0Ω
Fully Closed = <A Few Million Ohms

Stream (CURRENT/AMPS)

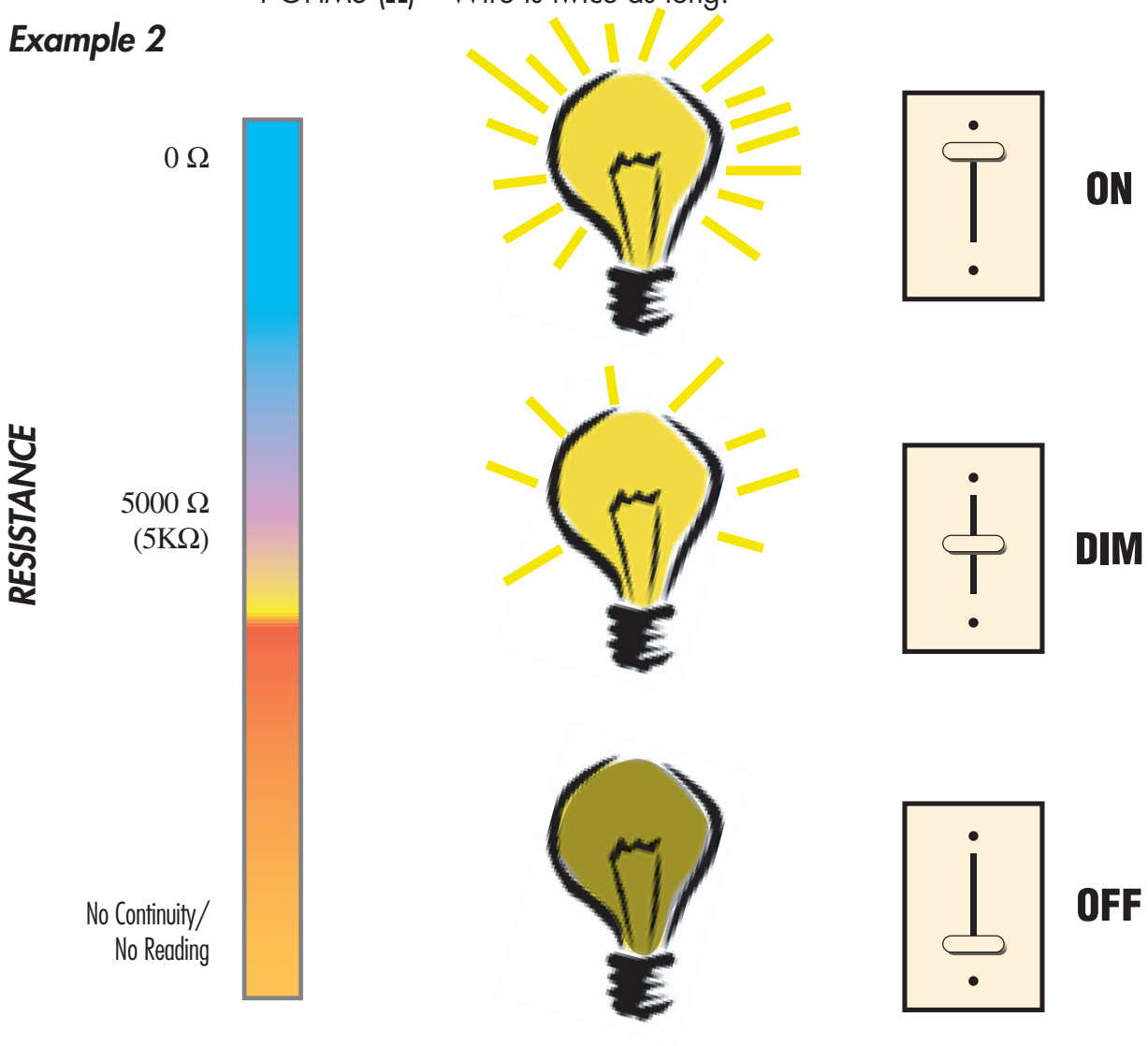
Paddle Wheel Rotates because of stream (POWER/WATTS)



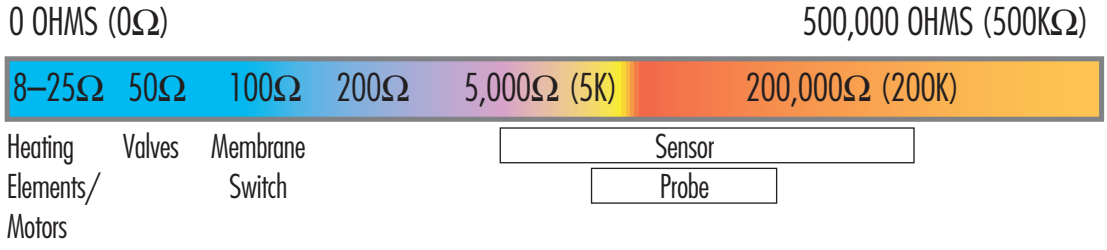
THE CONCEPT OF RESISTANCE OR OHMS (Ω)

Example 1

Example 2



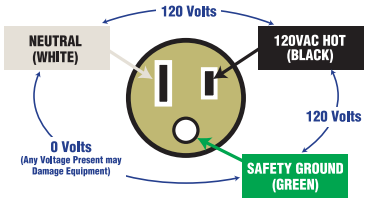
Example 3



BASIC POWER CONNECTIONS

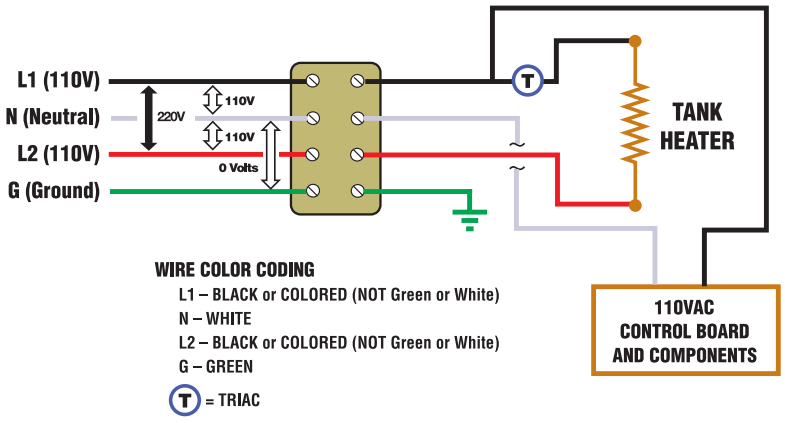
120VAC Single Phase Receptacle

GFI



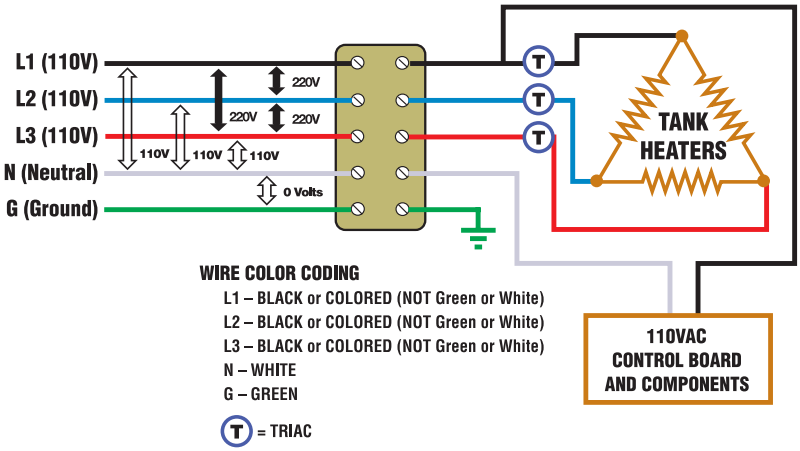
220VAC Single Phase Power Block

IMPORTANT: L1 voltage to Neutral must always be confirmed as 110V. In certain instances, L1 to N may be 220V ("Stinger Leg" – typically indicated by orange). If a "Stinger Leg" is present, it should not be used in the L1 position. Only a non-stinger leg should be used in L1 position. Confirm that line voltage is 110VAC.



220VAC Three Phase Power Block

IMPORTANT: L1 voltage to Neutral must always be confirmed as 110V. In certain instances, L1 to N may be 220V ("Stinger Leg" – typically indicated by orange). If a "Stinger Leg" is present, it should not be used in the L1 position. Only a non-stinger leg should be used in L1 position. Confirm that line voltage is 110VAC.



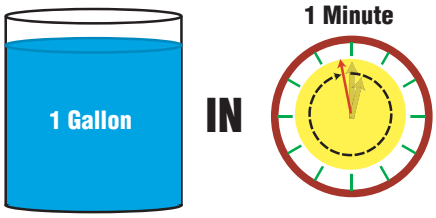
BASIC WATER – SUPPLY AND CONNECTIONS

Flow Requirements

Each piece of equipment should be connected to a supply line that provides a minimum of ONE GALLON per MINUTE **at the inlet valve connection**.

Pressure: 20 -100 PSI is recommended.

Supply lines should always be sized to ensure proper flow. (1 GPM.)

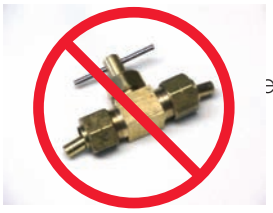


Valve Types

Ball valves should always be

Needle valves and self-piercing tap valves ("saddle valves") should NEVER be used.

Ball Valve



Needle Valve

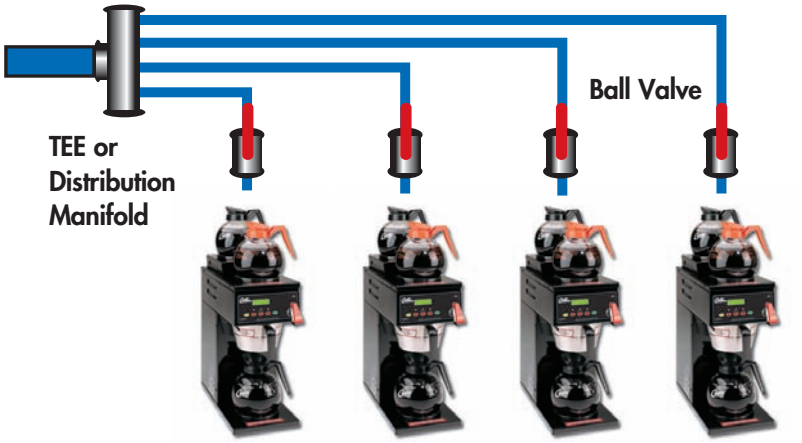
ed.

Saddle Valve

Connecting Multiple Brewers

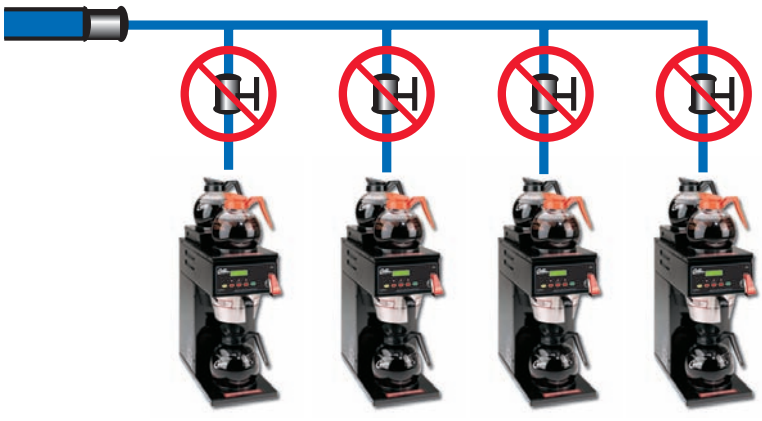
CORRECT

Water service is provided in PARALLEL with each connection controlled by a full port BALL VALVE.



INCORRECT

Single source provides water in a SERIES with all other equipment. Additionally, a NEEDLE VALVE has been used to puncture the main supply line and provide a connection to the equipment.



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