2-Gallon, Tabletop
REDI-DUPLICATOR
w/Semi-Automatic, Digital Processing

- Solid-State, Digital Design
- Semi-Automatic Processing
- Rapid Recycling • Displays Temperature • Easy Set-Up and Calibration • Air-Cooled
- No Water or Drain Hook-Up Required • Large 2 Gallon Capacity • Standard 115 Volt Electrical Requirement
- Esthetic Computer Putty Finish

Hydrocolloid duplicator specifications may be subject to change without notice as modifications & improvements are made.

Owner's Manual

Congratulations!

You have just purchased a quality piece of CMP Dental Laboratory Equipment. It has been carefully quality-controlled and thoroughly tested at the factory for optimum performance and durability. From the smallest bench unit to the largest floor-standing casting machine, each piece of equipment must adhere to the same standards of quality and efficiency that have made all CMP laboratory equipment an outstanding value.

If you have any questions regarding CMP's quality line of dental laboratory equipment and supplies, please call toll-free: 800-833-2343 or 800-888-5868 (Fax: 518-434-1288) between the hours of 8:00 AM and 4:30 PM Eastern Time. Or, if you prefer, visit us at our web site: www.cmpindustry.com . . . we will be happy to assist you.

Demand the best! Insist on quality CMP Dental Laboratory Equipment.

Unpacking

Carefully remove the duplicator from its shipping carton and check it for concealed damage. **If any damage is found, it must be reported to a representative of the carrier that delivered the duplicator.** The representative should come to your laboratory and fill out a damage report form. **Do not proceed until this has been done.** Notify us only *after* the above has been initiated.

If no damage has been found, lift the duplicator on to the bench where it will be utilized. It is best to have the unit adjacent to the place where the duplications will be cooled.

It is important to thoroughly review this manual and test your new duplicator prior to loading with duplicating material.

Electrical Connection

In most cases, your new Redi-Duplicator requires only a standard 115V–60 Hz outlet to operate. Before plugging the duplicator in, be sure the identification plate's electrical specifications agree with the electrical provided at the outlet. A separate circuit should be utilized as 115 volt units draw about 8 amps. As with any electrical device, take extra care when handling liquids around electrical connections to avoid accidental shock.

It is important to read the next section prior to actually plugging the duplicator in.

Testing and Inspection

This is a very important step in the installation of your new Redi-Duplicator. Even though your unit was fully tested and inspected before leaving CMP Industries, we cannot control the handling of equipment en route to you. For this reason we feel the following checks are very important.

Note: The parts list located in the back of this manual will help in the proper identification of items.

1. Remove rear panel and inspect visually. Look for loose connections and parts.

2. Replace rear panel after inspection.

3. Remove top cover and check to see that nothing is inside to interfere with the stirrer.

4. Replace top cover making sure stirrer slips over bearing in the center of the bottom of the tank.

5. Plug cover lead into receptacle located in rear of duplicator.

6. Check to be sure your duplicator 's identification plate voltage agrees with electrical voltage. Plug duplicator into electrical outlet.

Note: 115 volt duplicators draw about 8 amps while 230 volt draw 4 amps and should be on their own separate circuit.

7. If any lights come on, immediately push power switch to turn duplicator off.

8. Remove loading port cover and fill duplicator with 1-1/2 gallons of water.

9. Set low temperature control to 130°F using a clockwise turning motion.

10. Set high temperature control to 195°F using a clockwise turning motion.

11. Turn duplicator "ON" by pushing the "POWER SWITCH" in. The following should happen:

A. Red "POWER INDICATOR" light will come on.
B. Red "LOW TEMPERATURE" pilot light will come on located right below LOW TEMP CONTROL.
C. Temperature will appear on display.
D. Material will start to heat about 1°F in 2 minutes. (*This can vary slightly depending on voltage.)*

12. Add sufficient hot or cold water to obtain a reading of about 115°F. It will take about 1 minute for temperature changes to register on display.

Note: It may be necessary to remove water as needed to replace with hot or cold to reach the proper 115°F required.

13. Low temperature pilot light should go out when temperature reads 130°F *(the low temperature you preset).* Allow a ±3°F deviation from this set point.

14. Push "COOK-DOWN" button to start "high" heat cycle. The red cook-down pilot light should come on. *(The "cook-down" pilot light is located right below HIGH TEMP CONTROL.)*

15. The temperature will start to rise immediately. It should rise until the temperature reaches 195°F, the "high" temperature control set point. At this point, the temperature should read the same as the set point and the red cook-down light should go out. Allow a ±3°F deviation from set point.

16. Your new duplicator should now start to cool down to the low temperature setting.

17. Empty duplicator and you are now ready to load hydrocolloid.

Operation

GENERAL INFORMATION
Adjust Redi-Duplicator temperature settings to match those recommended by the duplicating material manufacturer.

Suggestions:

A. Low Temperature – Since your new duplicator is *stirring continually*, a lower storage temperature is possible. For most duplicating materials, we have found 130°F to be a good setting.

B. High Temperature – Start with the recommended set points and gradually lower setting. Use the lowest possible setting that will produce usable material.

Your Redi-Duplicator stirring motor runs *continually.* It will also run very warm, about 150°F. This is warm enough so you will not be able to hold your hand on the

motor. We keep the motor running because **(a)** we can lower the low temperature setting and **(b)** it has no adverse effect on motor life. *This will yield better duplications, longer colloid life and quicker cooling models.*

Your new Redi-Duplicator is never turned off *except* when changing duplicating material or cleaning.

COOK-DOWN
It is best to cook-down in late afternoon. This allows the cool-down to occur at night when it doesn't hold up your operation. The heating of the "cook-down" cycle should be done while you are present. This is where a failure could occur. We don't anticipate any failures, but we always want to operate in the safest manner possible.

Loading Procedure

1. Remove small round loading port cover located just in front of the stirring motor by pulling up on black knob. Check inside of duplicator to be sure tank is ***clean*** and ***empty***.

2. Read manufacturer's duplicating material instructions for recommended cook-down. If material is solid, cut-up into chunks until approximately 1 cubic inch in size.

3. Turn Redi-Duplicator on by pushing the "power" switch.

A. Motor will start.

B. Temperature will appear in the temperature display.

C. Bottom heater pilot light will come on.

D. Bottom heater will come on.

4. Start loading cut-up pieces of colloid.

Note: When using brand new material, it may help to allow the chopping action to run for ten minutes prior to pushing the cook-down button. This is only required with new material and may allow a lower cook-down setting thus yielding better duplicating material life.

5. Push "COOK-DOWN" switch "in" to start cook-down.

A. Cook-down light will come on.

B. Temperature will start to rise.

Temperature will rise about 2°F per minute. *(The temperature rise will vary slightly with voltage.)*

6. The red "COOK-DOWN" light will go out at the point you have the HIGH TEMP CONTROL set.

7. The duplicator will now start to cool. It will take about 4 hours to cool to a usable temperature of under 140°F.

Note: It is best to allow cool-down to occur overnight so not to interfere with normal working hours. *Cool-down time will vary due to room temperature.*

8. When using your Redi-Duplicator for the first time after cool-down, you may find the valve plugged due to packing of chunks above the valve ball. If this should occur, **TURN POWER OFF** and remove loading port cover. Use a long, thin probe to poke packed colloid out of opened valve.

9. Once valve is freed from obstruction, cover loading port with lid and restart your Redi-Duplicator.

Helpful Hints to Avoid Processing Trouble

1. DO NOT cycle Redi-Duplicator to cook-down mode when less than 2/3 full. This will prevent scorching and premature failure of the duplicating material.

2. Periodically check the accuracy of your duplicator by setting the "high temperature" dial to its maximum. Fill 2/3 full of water and cycle "cook-down". Since water boils ar 212°F, the water should climb to 212°F and stay there. If the temperature is within ±3°F, it is okay. If calibration is required, see calibration section on **page 11** of this manual.

3. Clean your duplicator approximately **once a month** or when new duplicating material is added. Your frequency of cleaning may vary with usage. Scrub inside wall of tank and cover assembly with a plastic pot scrubber. Coat inside of tank with silicone grease – CMP part number 61139.

4. When cleaning, **always check the black bearing in center of bottom of tank.** It should be *tight* and *not distorted!* Bearing should be replaced whenever damaged and/or yearly to insure optimum operation – CMP part number 40906P3.

5. Inspect stirrer for wear and distortion. Clean with plastic pot scrubber.
Caution: *Blades are sharp!*

6. Excessive wear of the tank bearing and stirrer can be caused by the introduction of trash during the duplicating process. This means a more thorough cleaning of

colloid is required.

7. What is the best possible cook-down temperature in my new duplicator?

The lowest temperature you can use and still have usable duplicating material.

We don't like to specify a temperature since it varies by manufacturer. Use their recommended temperature and slowly work down until you find the lowest point that yields satisfactory results.

8. ***The lowest storage temperature will give the best results.*** Our duplicators are continually stirring which allows a lower storage temperature and helps to prolong duplicating material life.

Note: You know your storage temperature is set *too low* when the colloid will not dispense.

9. Be very careful not to spill liquids on your duplicator! Liquids can short and damage the control panel and circuit boards. If a spill occurs, unplug the duplicator immediately, clean thoroughly and allow to dry.

10. If the motor starts to get excessively noisy, call CMP for advice. We will tell you how to get the bearings changed. *We do not* ***repair*** *motors.*

Specifications

Item: Semi-Automatic Hydrocolloid Duplicator #405811
Capacity: 2 Gallons (7.6 Liters)
Electrical: 115 Volt, 60 Hz – 8 Amp (230 Volt Model Available)
Height: 28" (71 cm)
Width: 14" (36 cm)
Depth: 14" (36 cm)
Shipping Wt: 50 Lb (22.7 Kg)

Colloid Storage

1. Remove colloid from the duplicating flask.

2. ***Rinse with water*** to remove any foreign material clinging to colloid

3. Gently shake off excess water.

4. Store colloid in a ***clean, covered*** container.

5. Keep container ***covered*** so moisture is not lost.

6. When ready to cook-down, cut colloid into pieces ***less than 1 cubic inch*** in size.

7. Remove loading port cover and start loading Auto-Duplicator.

8. When Auto-Duplicator is ***1/3 full***, push the "cycle" button.

9. After all the chunks have been added, ***make sure you add any liquid remaining in bottom of container.***

THIS IS IMPORTANT TO COLLOID LIFE!

The liquid contains chemicals which help preserve the colloid. Water in the liquid makes up for evaporation lost in the duplicating process.

Troubleshooting

PROBLEM: **RED POWER INDICATOR NOT ILLUMINATED**

Cause

1. Laboratory power source.

Remedy

1. Check building fuses and circuit breakers.

Cause

2. Blown duplicator fuse.

Remedy

2. Check main duplicator fuses.
Replacements: 65305P22 or 65305P24

Cause

3. Bad power switch.

Remedy

3. Check and replace if necessary.
Replacement: 65305P26

Cause

4. Bad pilot light.

Remedy

4. Replace if necessary.
Replacement: 40896P18

PROBLEM: **MOTOR FAILS TO OPERATE**

Cause

1. Motor not plugged in.

Remedy

1. Check to see that motor lead is plugged into back of duplicator.

Cause

2. No power light.

Remedy

2. Refer to #1 on page 8.

Cause

3. Blown fuse.
115V motor fuse is .4A MDL
230V motor fuse is .2A MDL

Remedy

3. Check motor fuse.
Replacement: 65305P23

Cause

4. Bad motor.

Remedy

4. Replace if necessary.
Replacement: 40963P11

Cause

5. Drive pin broken.

Remedy

5. Install new roll pin in stirrer..

Cause

6. Stirrer jammed.

Remedy

6. Free stirrer.
Caution: Motor runs very warm, near 150°F.

PROBLEM: **LOW TEMPERATURE PROBLEMS**

Cause

1. Colloid too hot or too cold.

Remedy

1. Check to see that low temperature control is set at current temperature.

Cause

2. Control temperature setting and display temperature don't agree.

Remedy

2. Loosen set screws on control knob and rotate until it is the same as the display temperature. Tighten set screws.

PROBLEM: **HIGH TEMPERATURE PROBLEMS**

Cause

1. High temperature control does not occur where you want it.

Remedy

1. Check to see that high temperature control is set at temperature you want.

Cause

2. Knob and read-out do not agree.

Remedy

2. See calibration instructions on **page 11**.

PROBLEM: **NO LOW HEAT – WILL NOT MAINTAIN STORAGE TEMPERATURE**

Cause

1. Display reads "1".

Remedy

1. Bad thermocouple.
Replacement: 10974

Cause

2. Low temperature red pilot light not on.

Remedy

2. See "1" above.

Check low temperature control setting.

Pilot light bad.
Replacement: 40896P18

Controller bad.
Replacement: Spec 2009

Cause

3. Low temperature red pilot light on.

Remedy

3. Bottom heater bad.
Replacement: 65268P2

PROBLEM: **NO "COOK-DOWN" CYCLE**

Cause

1. No cook-down light.

Remedy

1. Check high temperature control setting.

Cause

2. No cook-down light, cook-down switch held in.

Remedy

2. Bad pilot light.
Replacements: 40896P14

Bad cook-down switch.
Replacement: 62068

Bad relay.
Replacement: 41890P36

Bad control board.
Replacement: Spec 2009

Cause

3. Cook-down light on.

Remedy

3. Bad side heater (temperature would rise very slowly).
Replacement: 65268P1

PROBLEM: **COLLOID HARDENS IN VALVE**

Cause

1. Valve heater.

Remedy

1. Valve heater bad.
Replacement: 10860P1

Calibration of 405811 Semi-Automatic Duplicator

1. Fill Redi-Duplicator 3/4 full with water.

2. Turn “HIGH TEMP” dial fully clockwise.

3. Press and hold, momentarily, the “COOK-DOWN” button. The two heater pilot lights should be lit and stay lit.

4. Bring water to a rapid boil.

5. Using care, adjust R57 so that the LCD display reads 212°F.

6. Turn “HIGH TEMP” dial counter-clockwise and note where the heat shuts off. Loosen two set screws and adjust dial if necessary so arrow points to 212°F.

7. Turn “HIGH TEMP” dial fully clockwise again.

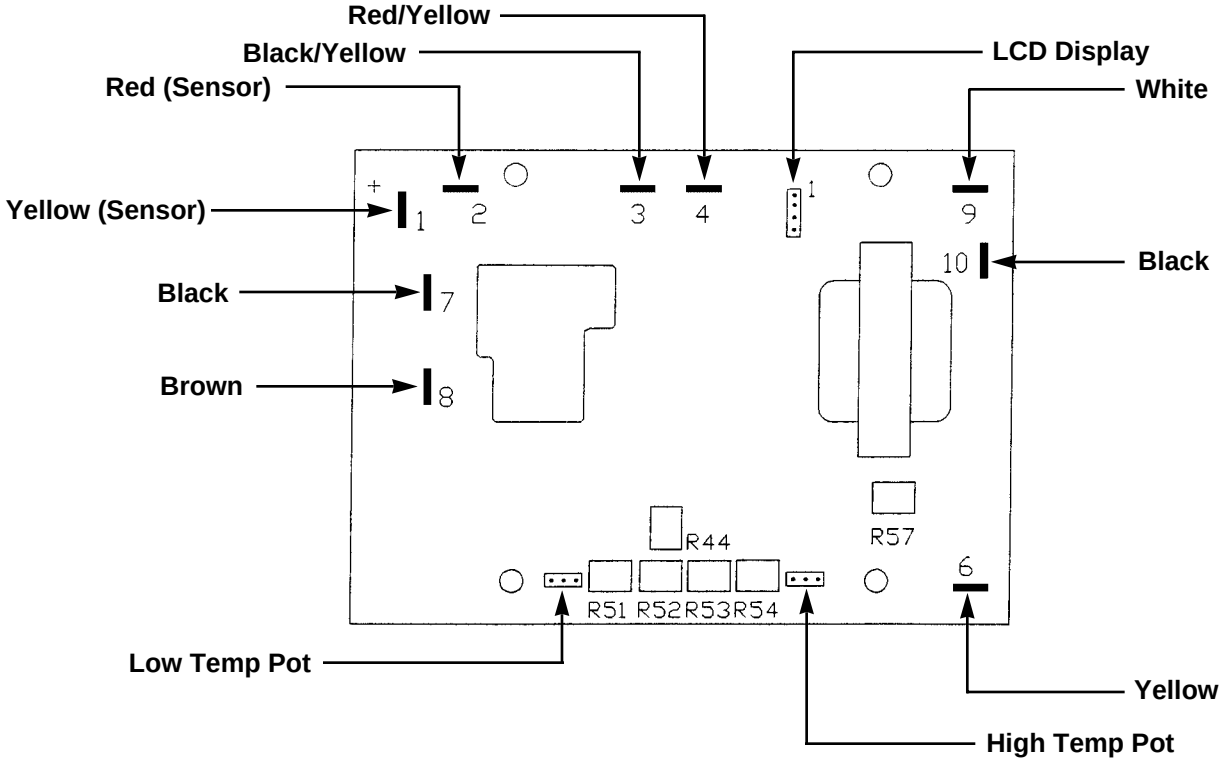
8. Press “COOK-DOWN” button until the two heater pilot lights become lit.

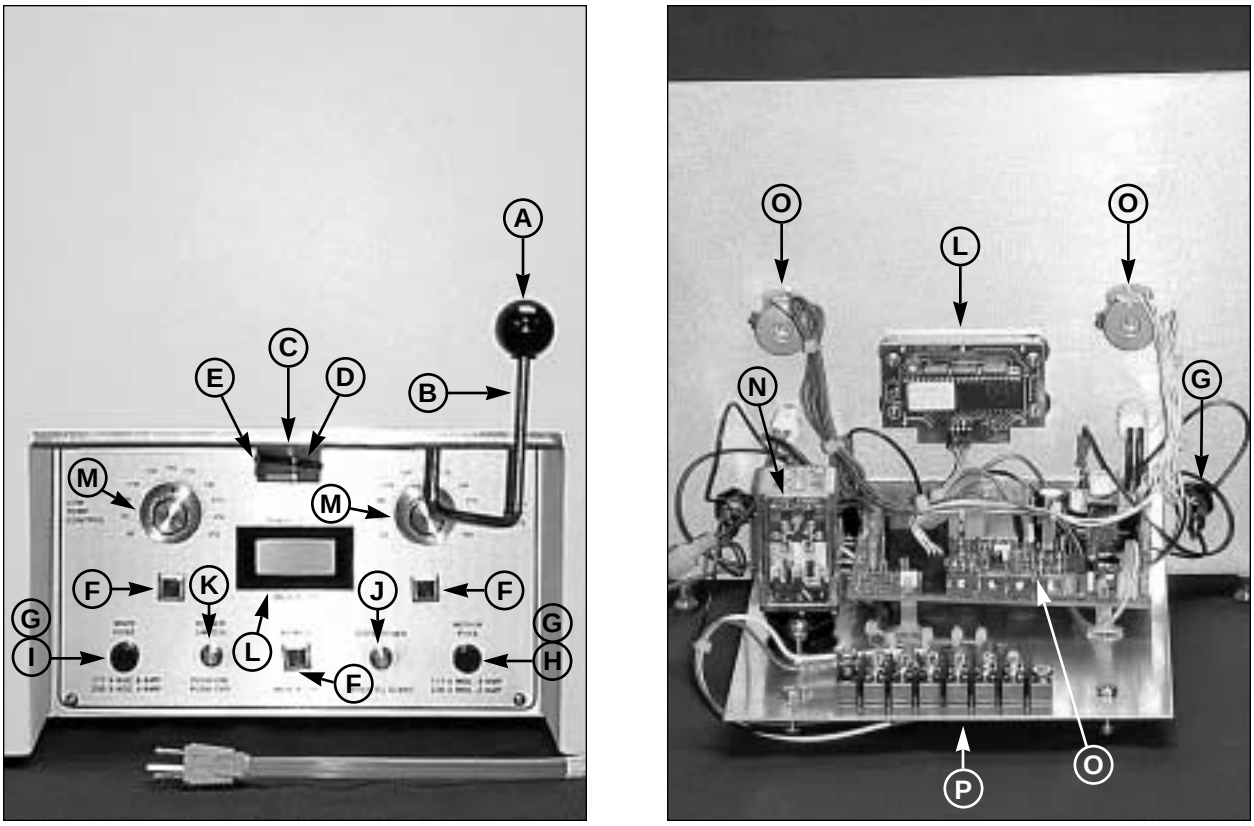
9. Turn “HIGH TEMP” dial counter-clockwise and make sure lights go off when arrow points to temperature that is on display.

10. Allow water to cool down to the “LOW SET POINT”.

11. Adjust “LOW TEMP” dial by loosening set screws so heat shuts off when display matches arrow on dial.

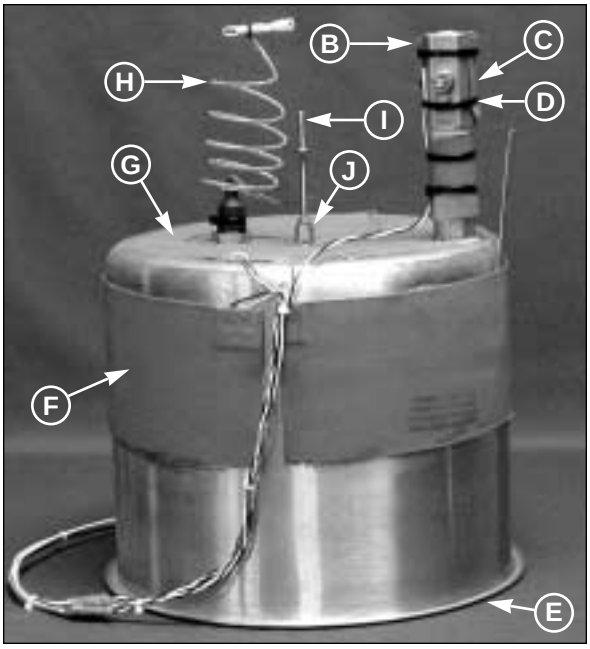
12. Your duplicator is now calibrated.





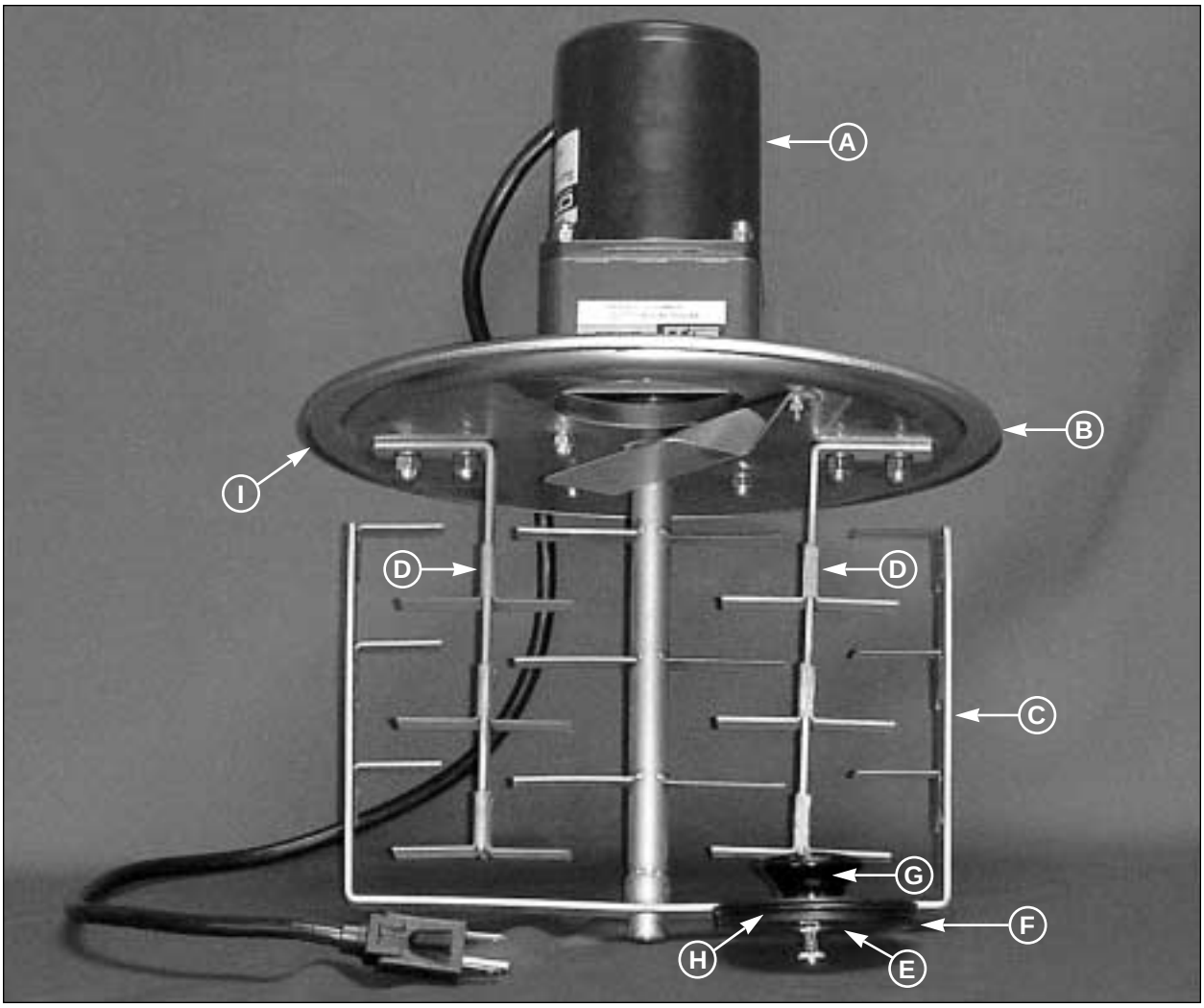
Front Panel Assembly

ITEM	DESCRIPTION	PART NUMBER
A	Knob, Valve Lever	40924P3
B	Valve Lever	36127G2
C	Valve, Complete	36127G1
D	Valve Heater	10860P1
E	Valve Ties *(4 Required)*	41890P49
F	Pilot Light, Red – 115 VAC	40896P18
G	Fuse Holder	40909P23
H	Fuse, Motor – 115 VAC/.4 MDL	65305P23
I	Fuse, Main – 115 VAC/AGC8	65305P22
J	Switch, Cook-Down	62068
K	Switch, On/Off	65305P26
L	LCD Display	Spec 2010
M	Knob, Thermostat	41890P43
N	Relay	41890P36
O	Printed Circuit Board *(Complete w/Switches)*	Spec 2009
P	Control Assembly, Complete	42056G1



Tank Assembly

ITEM	DESCRIPTION	PART NUMBER
A	Bearing, Bottom of Tank	40906P3
B	Valve, Complete	36127G1
C	Valve Heater	10860P1
D	Valve Ties *(4 Required)*	41890P49
E	Tank Assembly, Complete	40965G1
F	Side Heater	65286P1
G	Bottom Heater	65286P2
H	Thermocouple	10974
I	Threaded Rod	62051P2
J	Hex Nut	65289P2
	RTV Silicon – Adhesive for F and G *(Not Shown)*	



Cover Assembly 40917A

ITEM	DESCRIPTION	PART NUMBER
A	Motor with Gear Box	40963P11
B	Cover Assembly, Complete	40963G1
C	Stirrer Assembly	40964G1
D	Stationary Stirrer	42003P1
E	Small 3” Cover, Complete	36122G1
F	Cover, 3” Polypropylene Disk	36122P1
G	Knob, 3” Cover	40902P5
H	“O” Ring, 3” Cover	62066
I	Seal, Complete Cover – 1/8” x 1/2” x 33 3/4”	40963P10
	Seal, Teflon – for Stirrer Through Cover *(Not Shown)*	65175P2

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