

Jacketed Oil/Wax Tank Instruction Manual



Model: DJ-020

Important Safeguards

To reduce the risk of personal injury or property damage, when using electrical appliances basic safety precautions should always be followed, including the following:

- Read all instructions.
- Make sure nothing is turned on or plugged in until the water is completely covering the element.
- The outside of the tank will get HOT, use caution and keep children and pets away.
- Unplug from the outlet when not in use and before cleaning. Allow cooling before putting on or taking off parts, and before cleaning.
- **SAVE THESE INSTRUCTIONS**

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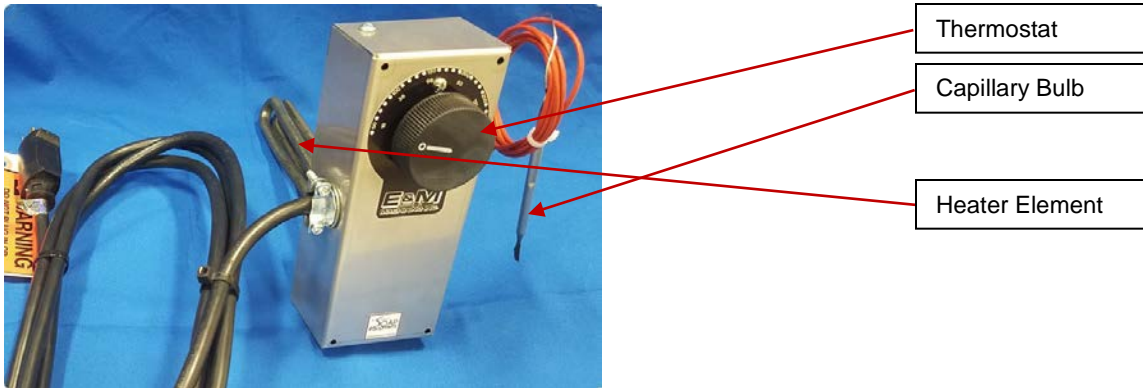
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Important Notes for All Tanks:

- The handle for the lid is temporarily fastened to the underside of the lid for packaging purposes. Just unscrew the two nuts and install the handle on the other side of the lid.
- You should have these items attached or included with your tank.
 - Ball Valve - Drain Plug - Heater/Thermostat - Lid with Handle
- Please read all instructions before attempting to set up your Tank.
- Before using your tank... Clean it with soap and water.
- Put enough water in it to check your tank for leaks.
- All Heater Elements have been tested for continuity before being packed.
- Do not use an extension cord or power strip.
- Consider hiring an Electrician or Plumber to install your tank.

**DO NOT PLUG IN THE HEATER UNTIL THE WATER JACKET IS FULL!
THERE IS NO FIRE HAZARD BUT IT WILL BLOW YOUR ELEMENT.**

General Heater/Thermostat Installation:



- Your, Heater/Thermostat comes supplied with a cord and plug.
 - 1500 Watt Heater/Thermostats are 120 volts and use a standard 3-prong plug.
 - 3000 Watt & 4500 Watt, Heater/Thermostats are 220-240 volt and have a 6-20P, 20 amp plug.
- If wiring direct to an outlet or electrical panel hire a qualified Electrician.

International Customers; you will need to use the proper style plug for your country. If you are not sure what is required, consult an electrician.

- Wrap Teflon tape, on the threads of the threaded fitting of the Heater Tube.
- Insert the Heater Tube into the 1 ¼" (32mm) Coupling. Make sure it fits in freely. Note: the Coupling is a female fitting that is about 2 ½" (64mm) up from the bottom of the tank.
- Screw the Heater/Thermostat into the Coupling. The electrical box is attached to the Heater Tube and will furnish ample leverage to make a leak-proof joint. You will be able to turn and tighten the Heater Tube enough, to end up with the controls right side up.

Capillary Tube Installation for Thermostats:

Be very careful when handling the assembly that you do not bend or kink the Capillary Tube.

The Capillary Tube is the long, thin tube that is coiled up, and attached to the Heater/Thermostat unit. The Capillary Tube & Bulb is about 5' (1.5m) long.

- You will first need to uncoil the Capillary Tube. *This is very fragile, so be careful not to kink it or make any sharp bends.*
- **All Tanks:**
 - Slip the Capillary Bulb all the way into the hole to the right or left of the heater box.
 - *Carefully bend the tube and place the rest of the tube against the tank side.*
 - You can use a heavy wire, bungee cord, or tape to hold the tube in place and out of the way.
 - If using one of our Insulation Jackets you can just enclose everything with this.
- **85 & 125 (and larger) gallon Tanks: These tanks come with 2 heater boxes**

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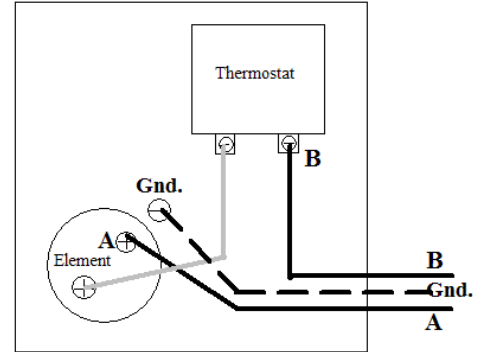
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- o Uncoil the Capillary Tubes so as not to kink it or make any sharp bends with it.
- o Slip the Capillary Bulbs into the holes to the right or left of the heater box.
- o Carefully bend the tube at the rim and place the rest of the tube against the tank side.
 - o You can use a heavy wire, bungee cord, or tape to hold the tube in place and out of the way.
 - o If using one of our Insulation Jackets you can just enclose everything with this.

Wiring Diagram and Chart:

Recommended Breaker or Fuse Sizes and Length of Heating Element

| | |
|--------|------------|
| 15 Amp | 1,500 Watt |
| 20 Amp | 3,000 Watt |
| 30 Amp | 4,500 Watt |
| 7" | 1,500 Watt |
| 10" | 3,000 Watt |
| 15" | 4,500 Watt |



Replacing the Cord for Direct Wiring:

1. Remove the screws, holding the cover on the electrical box.
2. Lift the cover off Carefully! Remember the Capillary Tube is connected inside.
3. On 110-Volt heaters, the black wire should go to terminal B on the Thermostat. In 220 volt installations, both hot wires go to A & B, does not matter which one.
4. Attach the ground wire (110 volts) or in the case of 220 volts, the neutral wire, to the ground screw.

If you are unsure or find that you may be in error when wiring your heater, seek the help of a qualified electrician. Local code may require the use of a licensed electrician for installations such as this.

Installing the Ball Valves:

- All Tanks
 - Make sure Teflon tape is on the threads of the 1½" (38mm) pipe nipple.
 - Screw the Ball Valve onto the pipe nipple. *This is to be tightened using preferably ONE HAND ONLY.* If you look at the pipe nipple you will see that the threads are tapered. As the valve is screwed on, the threads expand.
 - *Do not under any circumstance use a wrench or pliers. It does not take much for a good seal.*
 - When you feel the valve is getting tight, check the position of the handle to make sure it is UP when tight.



Filling the Water Jacket:

1. Check the Drain Plug and make sure it is sealed and tight.
2. After the Heater/Thermostat, Capillary Tube, & Ball Valve are installed, you can fill your Water Jacket.
3. Using a hose, bucket or container, pour water into the Fill Spout.
4. Bring the water level in the Fill Spout to about 2" from the top.
5. Hard Water or Water that may cause corrosion to your element... If you have this type of tap water or you are in doubt use RO water, distilled or bottled water. It will increase the life of your element.

Note: You can use Polypropylene Glycol, Mineral Oil, etc. in the water jacket. It takes a little longer to heat but it holds heat longer. For those working at high temps close to boiling it is much more efficient. You also

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rarely have to add liquid and it is much easier on your heating element. Most chemical suppliers carry these materials.

Warning... Be sure the water jacket of your tank is filled with water before applying heat. The heater tube of this tank must be immersed in water at all times. It will short out if not immersed in water.

Monitor and maintain the reservoir water level often. If it goes dry, it will burn up your element.

Maintenance:

- Drain your water jacket periodically. If for example, you use it every day, then we suggest every 4 to 6 months. If you only use it occasionally, then once a year may do. Much depends upon your usage and type of water.
- Hard water with lots of lime and minerals will need more frequent attention.

Insulating Your Tank:

- We highly recommend that you insulate your tank.
- You will find that your tank will stay warmer for a longer period of time. It will save you time and money.
- We make kits for all Oil/Wax Tanks. They are very efficient and easy to install. The foil facing reflects 97% of the radiant energy back to the tank.

Using Your Oil/Wax Tank:

Cautions in using your Oil/Wax Tank:

- The tank walls and lid can get very hot, be careful.
- Keep children and pets away from the tank and electrical components.
- Do not let your heater's water jacket run out of water or allow water to drip on your control box.
- When filling your tank, do not drop in heavy blocks of oils or wax. This can damage a weld and cause leakage.
- If you have to move the tank, let it cool and drain it completely.
- Do not over-tighten your Ball Valve and do not move your tank using the Ball Valve as a handle.

Heating Oils:

- If you heat your hardest to heat oils first, such as Palm or Palm Kernel, Shortening, etc, it will reduce the melting time for the rest of your oils.
- For example, if using Palm, Coconut, and Olive as a base, melt your Palm first then put in the Coconut, then the Olive. By the time the Olive is added, your oils should be cooled down close to your mixing temperature.
- You may find in very cold situations that the oil or wax in the outlet or valve will set up solid. You can heat it with a hairdryer or heat gun, just don't melt anything. A wire can usually dislodge the solids.

General Usage Information:

- How hot can the tank get?
 - If you are using water in the water jacket then you will only be able to get to about 190°F (88°C) or so, and that is under ideal conditions. Water will not go past boiling point 212°F (100°C). This means that the heat has to be transferred to the inner tank and there is always a loss of heat there.
 - "But the Thermostat says 250°" That is just a manufacturer setting.
- How can I get to higher temperatures?
 - To efficiently get beyond 170° you should insulate your tank very well.
 - We recommend this in any case because the room is always going to be cooler than the tank so it is going to be pulling heat off the tank.
 - We suggest placing the tank on a 1" (25mm) or thicker styrofoam pad, with a piece of plywood, masonite or OSB between the tank and foam. This keeps the heat transfer down.
 - Insulate the tank around the outside. We do sell an insulation jacket for our tanks but if you are trying to get high temps, purchase two jacket thicknesses.
 - Use an element with a higher wattage. This is a quick fix but not the most efficient or best.
 - Do not keep opening and closing the lid.
 - Use a Heat Transfer Liquid in place of water in the outer tank jacket.
 - PPG (Polypropylene Glycol) is an industry-standard for this type of application.

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- Purchase a PPG with a corrosion inhibitor. The inhibitor keeps the solution from damaging the element.
 - PPG allows you to get above the boiling point in the outer jacket making it much easier to transfer heat to the inner at higher temps. This is much safer than boiling water which will then cause steam, dripping, condensation, etc.
 - You want to use a 30-40% solution, 3 parts PPG to 7 parts water.
- How long will it take to heat?
 - Many factors will come into play when determining this. How cold is the material that you are putting into the tank? What temperature will you be heating it to? What is the temperature in the room where the Oil Heater is? Is the Oil Heater going to be insulated? Will the material be in chunks or liquid? How much material is to be heated.
 - The larger the chunks, the slower it will heat. The more contact you have to the tank surface, the faster the transfer of heat.
- The unmixed liquid in the nipple and ball valve; all you need to do here is simply drain it out and pour it back in. Do this a couple of times and everything is mixed.
- Put your tank on a Timer. This will eliminate standing around waiting for it to heat up and make sure it is ready when you want it ready.
- Storing oils and wax in your tank.
 - By all means, take advantage of this, especially if you are making soap. Fill the tank up with the correct ratio of base oils. When it gets low just add more oils based on your ratio.
- Can you set an Oil/Wax Tank at a particular set point and will it maintain that temperature?
 - You can maintain an even temperature by just setting the dial on the thermostat to a particular setpoint.
 - The thermostat turns on and off with changes of + or -, 2 degrees Fahrenheit.
 - There will be a slight temperature variance between the inner tank and the water jacket but if you insulate it, the difference is minimal. Always check the temperature of the contents and make notes on where the dial is set. This way you always know right where to set your thermostat
 - Because it is a water-jacketed tank, it will maintain a very constant and even heat. The jacket goes nearly all the way to the top of the inner tank so no matter how high the contents are that you are heating, the heat will be evenly distributed
- Mixing cold processed soap in the tank.
 - This can be done but not recommended, soap gets thick so never go past a light to medium trace or you will be scooping the contents out. Using our Pot Tipper for a proper mixing vessel.
 - We suggest pouring into buckets or other vessels and then adding your scent and additives.

Troubleshooting Section:

Leaks:

- Leaks from Fittings:
 - Cross-threading the fitting will cause leaks. Be careful to make sure you start right before turning the fitting. If it seems tight at the first it is likely cross-threaded. Go back and start over.
 - Not enough Teflon Tape.
 - If you remove the fitting for any reason, you must apply tape or sealant again.
- Leaks coming from Heater Box: Unplug the Cord First!
 - Open Heater Box to see if the leak is coming from the element. You may need to reinstall and replace the O-Ring.
 - If the Heater Box was not installed properly, water can run from the coupling along the screw fitting into the Heater Box.
- Leaks in the Inner Tank:
 - We test the tanks several times for leaks.
 - If you have a leak, you could have had shipping damage.
 - Did you drop a heavy chunk of something into the tank and break a weld?

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- What seems like a leak but is condensation. This is very rare with double jacketed tanks.
 - This can happen at any location, usually at the bottom and you will think it is leaking from a fitting.
 - The best thing to do is to remove the jacket and watch the tank for a few days or uses.
 - If it is not continuing then it was condensation.

Troubleshooting your Tank, if it is not heating:

First, check the following.

- Is the unit plugged in?
- Is the cord and plugged in good shape, not cut or damaged?
- Has the Breaker been tripped or a fuse blown?
- Have you checked to see if something else that you know works, will work in the outlet?

Let's check the Heater/Thermostat box.

Call an Electrician or Plumber, if you do not know what you are doing. If it is not heating, then it is likely that it is not installed correctly or something in the circuit providing the power is not correct.

Testing Element:

BEFORE TESTING YOUR ELEMENT... UNPLUG YOUR HEATER/THERMOSTAT!

Tools needed:

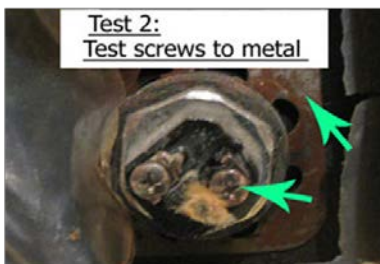
- Philips screwdriver
- Volt / Ohm meter (Multitester)
- Leave the unit on the tank for the first part of the troubleshooting.
- Carefully remove the cover and be very careful with the Capillary Tube. If that gets kinked you will need a new Thermostat.
- See below on how to remove the cover.
- Before doing anything else, check for loose wires or loose connections.
 - If you have a loose connection or wire
 - Tighten up the terminal or replace the wire to the terminal and tighten the connection.
 - Replace the cover
 - Check your water
 - Plug in the tank and see if it works. Go to the next step if this doesn't work.
- Disconnect the wires to the heater element.



Test 1:

Test across both element screws. Resistance should read close to the following Ohms.

- ☐ 1500 watt element, (115V), about 8 to 10 Ohms
- ☐ 3000 watt element (220-240V), about 16 to 19 Ohms.
- ☐ 4500 watt element (220-240V), about 11 to 13 Ohms.



Test 2:

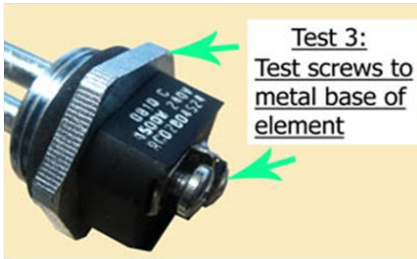
- Test each screw to the bare metal part of the water heater.
- Test both screws.
- If multimeter reads any Ohms at all, or if needle moves even tiny bit, then the element is shorted, and needs replacement.

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Test 3:

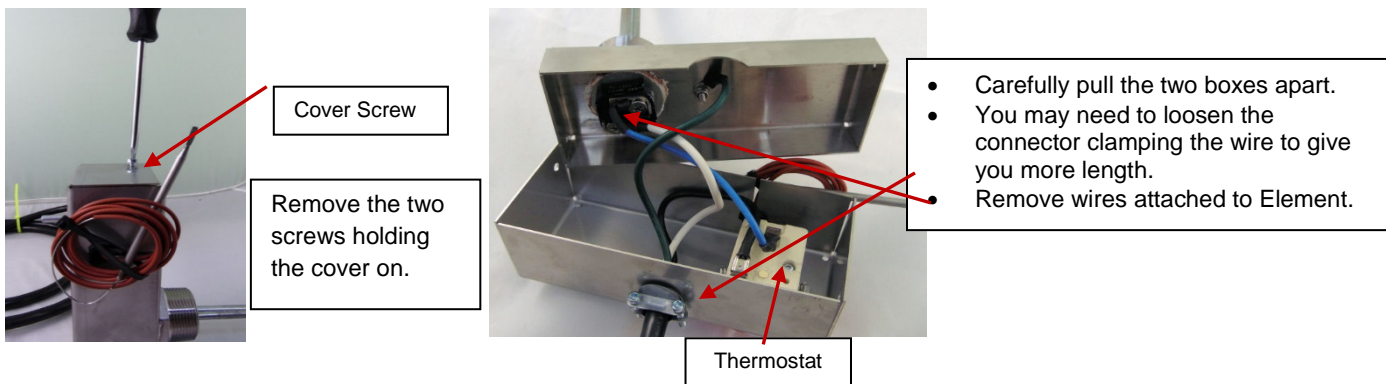
For this test, you must remove the Element from the Heater/Thermostat.

- Test each screw to the metal base of the element.
- If the multimeter reads any Ohms at all, or if needle moves even tiny bit, then the element is shorted and needs replacement.

Replacing your Element:

**MAKE SURE THE HEATER/THERMOSTAT IS UNPLUGGED!
DRAIN OUTER JACKET AND REMOVE HEATER/THERMOSTAT FROM TANK.**

When replacing the Element for the Analog Thermostat, do not kink or put pressure on the capillary tube.



- To loosen, use a crescent wrench, channel lock pliers or you can buy an element wrench at the hardware store.
- Turn the Element in a counter-clockwise direction.
- Wrap three full wraps around the element threads with Teflon Tape.
- Spread Pipe Seal, liberally, on the new Element treads.
- Screw in new Element then tighten clockwise direction.
- You want the O-Ring compressed but not flattened.
- If in doubt. call a Professional.



- You can put a little water in the fitting opening to see if there is a leak.
- To re-assemble; reverse the process of disassembly, start by replacing the wires.
- Remember to be careful with the Capillary Tube.
- Lubricate the fitting that screws into the Tank Coupling with pipe seal.
- Follow directions on 1st and 2nd pages to reinstall.

Testing and or Replacing your Analog Thermostat:

This can be done without removing the Heater Box from the Tank. Always

test the element first as this is usually what may be the issue if there is no heat.

MAKE SURE THE HEATER/THERMOSTAT IS UNPLUGGED!

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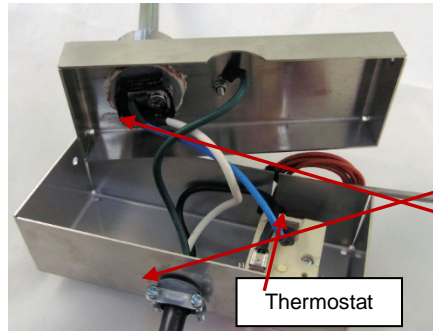
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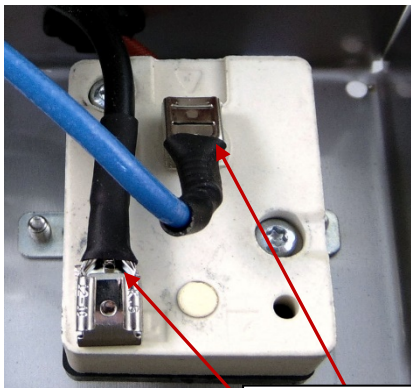
Cover Screw

Remove the two screws holding the cover on.



Thermostat

- Carefully pull the two boxes apart.
- You may need to loosen the connector clamping the wire to give you more length.
- Remove wires attached to Element.



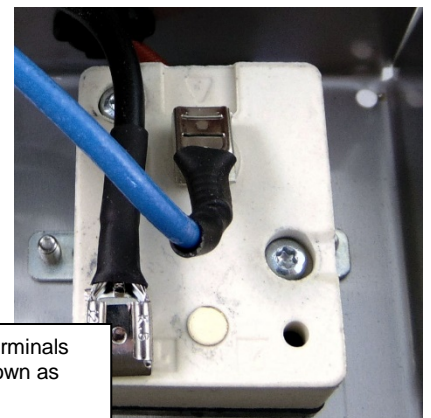
Probes here

Testing the Thermostat (Tstat) for Continuity & Temperature Reading

- Using an Ohm Meter, set the dial to ohms.
- Turn the dial all the way up.
- Put a probe on each terminal.
- You should read continuity (complete circuit).
- If nothing is reading, you have a bad Tstat.
- If you have continuity, you can now test if the Tstat is reading properly.
- To test for proper temperature reading, you need a thermometer and a container of hot water. Hot tap water is fine.
- Carefully remove the Capillary Tube. Do not kink it.
- Place the dial of the Tstat up where you can see it.
- Turn the Tstat all the way down to its lowest setting.
- Check the temperature of the water.
- Place the Capillary Tube in the water.
- Turn the dial slowly up and listen for a click.
- You should hear a click about where the temperature is set on the dial.
- You can double check this a couple times using warmer or cooler water.
- If the temp is way off then your Capillary Tube is kinked or the Tstat is no good.

Replacing the Thermostat (Tstat)

- Remove knob and screws holding Thermostat.
- Remove wires carefully working connectors back and forth sideways slightly to make it easier.
- Remove Thermostat.
- Replace Thermostat with new one.
- Remember to be careful with the Capillary Tube.
- Replace wires, making sure you bend the tabs over just like the one you took out. This prevents shorts.
- To re-assemble, reverse the process of disassembly.
- If you have removed the entire assembly and taken it out of the tank, follow directions on 1st page to install.



Be sure the terminals are pushed down as shown here.

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