

Watlow Start-Up Guide Electric Heaters

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The two most important factors to properly install a Watlow® electric heater are: Following the instructions from the installation guide and using the correct tools.

A Watlow electric heater is designed for optimal performance within industrial applications for many years. These key steps will ensure that installation is smooth and that your Watlow heater will maintain high performance.

Check the Heater and its Elements

Before installing a new Watlow heater, verify all heating elements and visible parts of the assembly are free from defects caused by shipping. Any bends or nicks in the unit could reduce the overall performance of the heater and limit its usage.

Perform a Megohm Test

After verifying the integrity of the unit, perform a Megohm test to measure the insulation resistance of the heating system. The system could fail the Megohm test if the insulation becomes wet or damp.

A Megohm test (<https://www.watlow.com/blog/posts/how-to-determine-if-an-electric-heater-is-good-or-bad-using-an-ohmmeter>) uses direct current voltage to test the insulation resistance of the heating unit. Insulation resistance is the ability of magnesium oxide (MgO) to keep electricity within its bounds. There should be complete resistance between the inside and outside of the insulation. What is being measured is the resistance from the heater to the ground.

If the heater does not perform in the acceptable range in the Megohm test, it could lead to long-range problems with the heater if it is wet or if the resistance is in the low range. Verify with the Watlow installation and maintenance manual what the insulation resistance should be for the heater that you have purchased.

A heater might have to be baked out (<https://www.watlow.com/blog/posts/what-is-heater-bakeout-and-why-is-it-important>) if it becomes damp inside. A “bakeout” means elevating the temperature in the heater to dry it and clean it up before complete installation into the system. If it is wet and dirty, sometimes a vacuum is required to eliminate loose particles floating around.

The installation and maintenance manual has complete directions for conducting a Megohm test. Remember that high voltage can lead to a ground short, which could lead to sparking and potentially an internal explosion. Low voltage will not lead to the same type of reaction and can be used to bake out the heaters.

Installation with Proper Tools

Installing a heater with the proper tools is crucial to a successful installation. Some heaters, like a flange heater, might require different tools than the screw plug heater.

The best tool collection will depend on the type of electric heater being installed. Using the tools outlined in the installation and maintenance manual is essential. Incorrect tools can damage the welding and wiring on a heater, which would require a new unit.

Consult the Wiring Diagram

After attaching the heater following the directions from the Watlow installation guide, the first objective is to affix the wires to the bases of each terminal.

Attaching the wires properly requires a threaded stud and a threaded nut. First, remove the threaded nut off the jumper, add a rain connector onto that wire and then put that connector over the threaded stud. That nut needs to be tightened, but be careful not to overtighten the nut. Torque values for nuts are eight in/lbs for nuts that do not go over a jumper and 20 in/lbs for nuts that go over jumpers.

After the Megohm test has been completed and the wires have been attached, the construction portion of the heater installation is finished.

Perform the Proper Ohm's Test

The final step is to perform an Ohm's test (<https://www.watlow.com/blog/posts/how-to-determine-if-an-electric-heater-is-good-or-bad-using-an-ohmmeter>). That requires using an Ohmmeter. An ohm reading will check for electrical connectivity issues with a heater.

1. Make sure there is a battery in the ohmmeter.
2. Zero the meter by touching the leads together and adjusting the reading to zero ohms.
3. Disconnect the electric heater to avoid damages or the risk of electrocution.
4. Adjust the scale of the ohmmeter, selecting tens, hundreds or thousands, depending on the requirement of the heater.
5. Touch the probe's opposite ends of the circuits and compare the reading with the heater's expected resistance.

The difference between an Ohm's test and the Megohm test is that the Ohm's test checks for electrical conductivity problems.

An Ohm's test is used more often after the heater has some wear and tear on it. Like any product, heaters start to break down after years of use.

It is good practice, though, to make sure a new Watlow heater has the proper Ohm's reading out of the box to double-check that it hits all the standards.

