

# LEDars

## ELEMENTS

### PTC HEATING ELEMENTS

Unit 17 Hambleton Park, 98 Richards Drive,  
Midrand, Johannesburg,  
South Africa

+27 (0) 11 312 5754  
+27 (0) 64 503 3846  
<http://www.rsenergy.co.za>

## PRODUCTS:

A 2kW LEDars element heats water at approximately the same rate as a 3kW standard resistive element, reducing energy consumption by 1kWh per hour of use. For an average household this is approximately 1000 units each year. 2kW LEDars element = 3kW standard element: 3kW LEDars element = 4kW Standard element.



FLANGE MODEL



SCREW-IN MODEL

## LEDars TECHNICAL SPECIFICATIONS

MODEL	2KW FLANGE	3KW FLANGE	2KW SCREW-IN	3KW SCREW-IN
Power (w) +5%/-10%	2000	3000	2000	3000
Rated Voltage (V)	230	230	230	230
Inrush Current (A)	<18	<21	<18	<22
Inrush Duration (s)	35	35	35	35
Steady State (A)	9	13	9	13
Dry Burn Cycles	Tested to over 5000 cycles			
Material	316 Stainless Steel with PTC ceramic core			
Weight (kg)	1.67	1.9	1.1	1.26
Length (mm)	400	400	370	370
Diameter (mm)	50	50	34.4	34.4
Surface Temp (°C)	270	270	270	270

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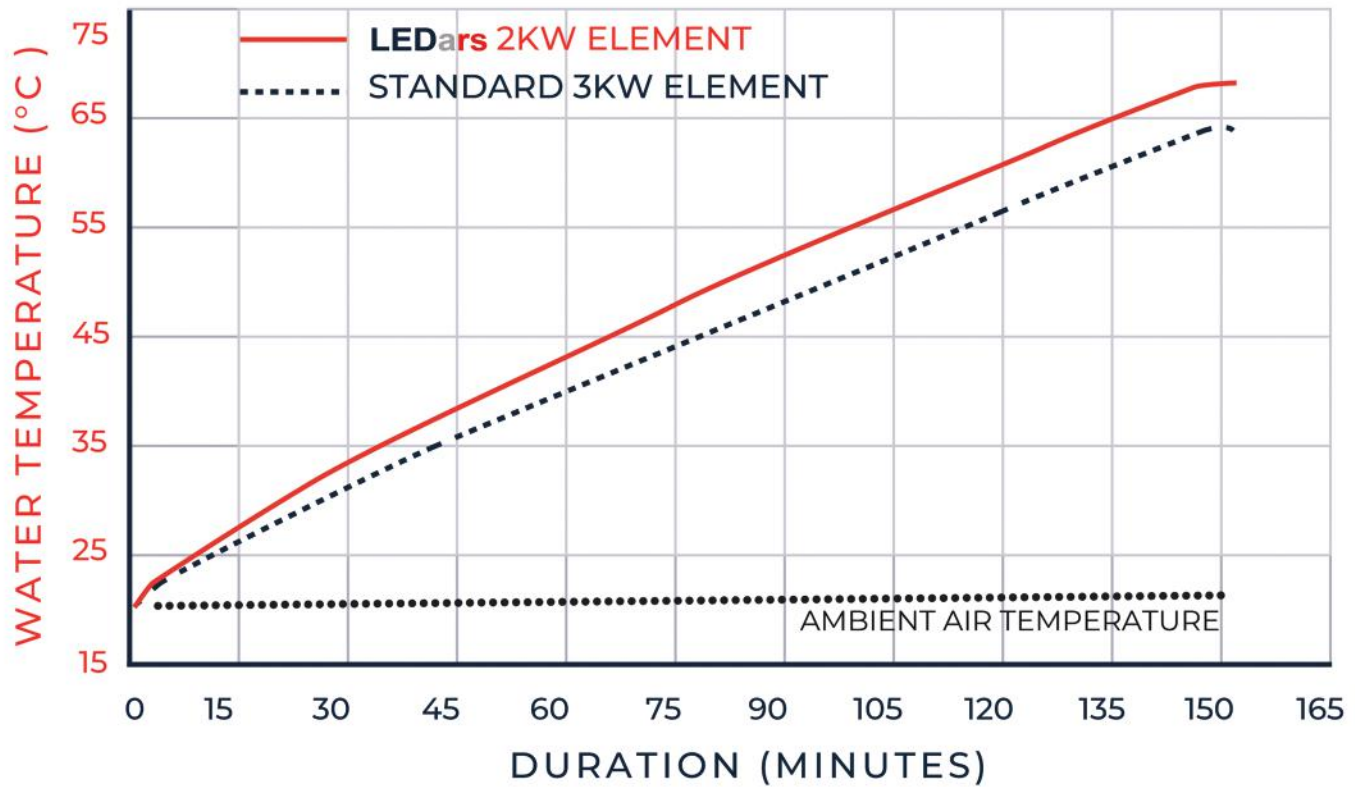
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## COMPARATIVE HEATING RATES :

The graph shows that a 2kW LEDars element heats water at around the same rate as a 3kW standard element. These are independent results from Kwikot test facilities comparing new elements.

Over time, LEDars elements will maintain efficiency better than a standard element due to reduced scale build up and the inherent nature of PTC.



## WHAT SIZE ELEMENT DO I USE ?

This depends on how you use hot water. The image below shows the heating times.

### APPROXIMATE HEATING TIMES FROM COLD

\*\*Assumption - 40°C change in temperature



3kW - 2hrs 30mins  
4kW - 1hr 30mins



2kW - 2hrs 30mins  
3kW - 1hr 45mins

3kW - 3hrs 30mins  
4kW - 2hrs 30mins



2kW - 3hrs 30mins  
3kW - 3hrs

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## BENEFITS :

<p><b>ENERGY SAVING</b></p>	<p>LEDars elements use around 25% less energy than a standard element, by reducing heat losses. LEDars elements use positive temperature coefficient (PTC) instead of resistive wire. PTC has a lower watt density and better heat transfer.</p> <p>LEDars elements have a maximum surface temperature (in air) of 270°C. A standard element is over 500°C.</p> <p>To compensate for the lower watt density, LEDars elements have a much larger surface area than standard elements. The combination of PTC and other design features ensure that more of the heat is transferred to the water and less to the environment.</p>
<p><b>HARD WATER</b></p>	<p>LEDars elements PTC heating chips are protected by 316 (marine) stainless-steel. The low watt-density reduces the rate at which lime scale and other solids build up on the element and inside the tank.</p> <p>By the time a standard element fails it is only heating at around 50% efficiency. LEDars elements maintains efficiency over time and can be cleaned if required.</p> <p>LEDars elements will also not burn out, it will simply stop drawing power. (See dry burn below)</p>
<p><b>SOLAR PV</b></p>	<p>A 2kW LEDars element heats at a similar rate to a 3kW standard element (see graph).</p> <p>A 2kW load works well with any solar PV system and turns the geyser into an energy storage asset, not an additional problem.</p>
<p><b>DRY-BURN</b></p>	<p>The key property of PTC is that the internal resistance increases to 100% at the designed set point. I.e. once the element reaches 270°C it stops drawing power. If a geyser empties a standard element will quickly melt and fail.</p> <p>LEDars elements will reach 270°C and stop drawing power in air. After about 15-20 minutes, as the element is in an insulated geyser, the LEDars elements will turn on briefly, reach 270°C and turn off again.</p> <p>This is defined as a dry burn cycle. LEDars elements are tested to over 5,000 of these.</p> <p>This means that if the geyser empties or fails, the LEDars elements can be installed in the new geyser and will work as designed.</p>
<p><b>SIMPLE INSTALLATION</b></p>	<p>LEDars elements require no additional parts and are installed exactly like a standard element. Any qualified person can do this.</p> <p>We would recommend installing a new thermostat when you install an LEDars element.</p> <p>Installing a timer can also reduce heating costs and is required for LEDars elements to work well with solar PV.</p>



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## INSTALLATION GUIDE :

Bath and shower water is 40-45°C. Geysers should heat water to above 55°C to kill bacteria. The water in the geyser is hottest at the top and coldest at the bottom. Setting the thermostat depends on multiple factors, but the goal is to set it to the lowest acceptable temperature in order to minimise energy consumption.

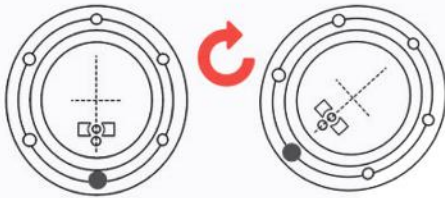
The set temperature on a stat can vary by up to 10°C from stat to stat. If the water is too hot or cold, the stat may need to be adjusted.

### 50MM FLANGE MOUNT MODEL FITMENT

A standard element has the thermostat in the middle of the element. Thus heat is constantly passing the stat. With LEDars elements, the thermostat is not only lower in the geyser, it is below the element. As heat rises the thermostat gets the heat later than with a standard element.

The stat setting will vary by geyser, but we recommend setting the stat 10°C lower than for a standard element.

1. Ensure NO WATER gets inside the grub screw hole during fitment.
2. For Kwikot geysers turn the base plate clockwise by one screw fitting as below



3. Turn thermostat down 10°C from original setting.



**\*\* TURN THE  
THERMOSTAT DOWN BY  
+- 10°C \*\***

If this step is not followed the water may be too hot for the customer and then require an additional site visit to adjust the thermostat down.

We recommend replacing the thermostat as the element is new and it is good practice to install a new thermostat at the same time. This can prevent additional site visits to replace old and faulty thermostats.

### 35MM BOSS SCREW MOUNT MODEL FITMENT

- Some of the screw-in spiral elements have the thermostat pocket in the center of the element.
- This is not possible with the PTC design.
- When the LEDars screw-in element is installed, the thermostat pocket needs to be separate.
- Some geysers have a separate pocket.
- Some have a spare port that can be used as a pocket. This requires some additional parts.
- The thermostat setting will depend on the position relative to the element.