For the safety of electricians, tradesmen and home owners, clause 4.8.2.3 of AS/NZS 3000:2018 now states that an independent lockable isolating switch shall be installed on every fixed-wired hot water heater.

The change has been welcomed by electricians throughout the industry, many of whom have anecdotal instances of probable safety issues that an isolator eliminates;

- Welded contacts resulting in the circuit being live when the hot water switch is OFF;
- Bumping a rocker switch and turning the circuit ON during maintenance;
- Face plates being back-lit by an arc if the switch is turned off when the circuit is under load.

As switches have widely been installed by default in the past – and a switch and an isolator have different functions – the question is – What is the difference between a switch and an isolator – and is there one that does both?

**SWITCH**

A switch is a device to make, break and carry loads according to defined utilisation categories.

Duties such as direct-on-line motor switching (AC-3) and reversing (AC-4) require making and breaking 8 to 10 times the rated current. A switch may have multiple positions, also including an OFF position, but does not have to meet the isolation tests. Resistive loads such as hot water heaters utilize category AC-21.

<table>
<thead>
<tr>
<th>Utilization Category</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC-20</td>
<td>Connecting and disconnecting under no load conditions</td>
</tr>
<tr>
<td>AC-21</td>
<td>Switching of resistive loads including moderate overloads</td>
</tr>
<tr>
<td>AC-22</td>
<td>Switching of mixed resistive and inductive loads including moderate overloads</td>
</tr>
<tr>
<td>AC-23</td>
<td>Switching of motor loads or other highly inductive loads</td>
</tr>
<tr>
<td>AC-3</td>
<td>Direct starting and switching off of squirrel cage motors during running</td>
</tr>
<tr>
<td>AC-4</td>
<td>Motor reversing, inching, plugging</td>
</tr>
</tbody>
</table>

**OFF LOAD ISOLATOR - DISCONNECTOR**

An OFF load isolator is rated at AC-20 to carry current in the closed position. It is not rated to switch either resistive or inductive loads. The circuit must include an additional load rated switching device.

**ON LOAD ISOLATOR – SWITCH DISCONNECTOR**

An ON load isolator (switch disconnector) meets both the switch requirements and the isolation requirements. It is the ‘Isolating Switch’ that is intended for installation in water heater circuits.

Q. Is Neutral an active conductor?

Clause 1.4.5 defines active conductors as those maintained at a difference of potential from the neutral or earthed conductor. Therefore the neutral is not an Active Conductor in this application.

Q. Does the Neutral get switched?

No. According to Clause 2.3.2.1.2 section (b), “Active conductors shall be switched...” The Neutral is not switched.

Q. Is every enclosed switch with a padlock handle an Isolator?

No. There are switches available on the market with padlock handles.

Q. How do I identify the different products?

There are international symbols which shall be shown on the product to identify them.

**Switch**

**Disconnector**

**Switch Disconnector**

So the solution is to install a correctly rated switch disconnector (ON load isolator) from a reputable manufacturer.

Please refer to AS/NZS 3000:2018 and AS/NZS 90947-3 (Low Voltage Switchgear and Control Gear) for complete details and information.