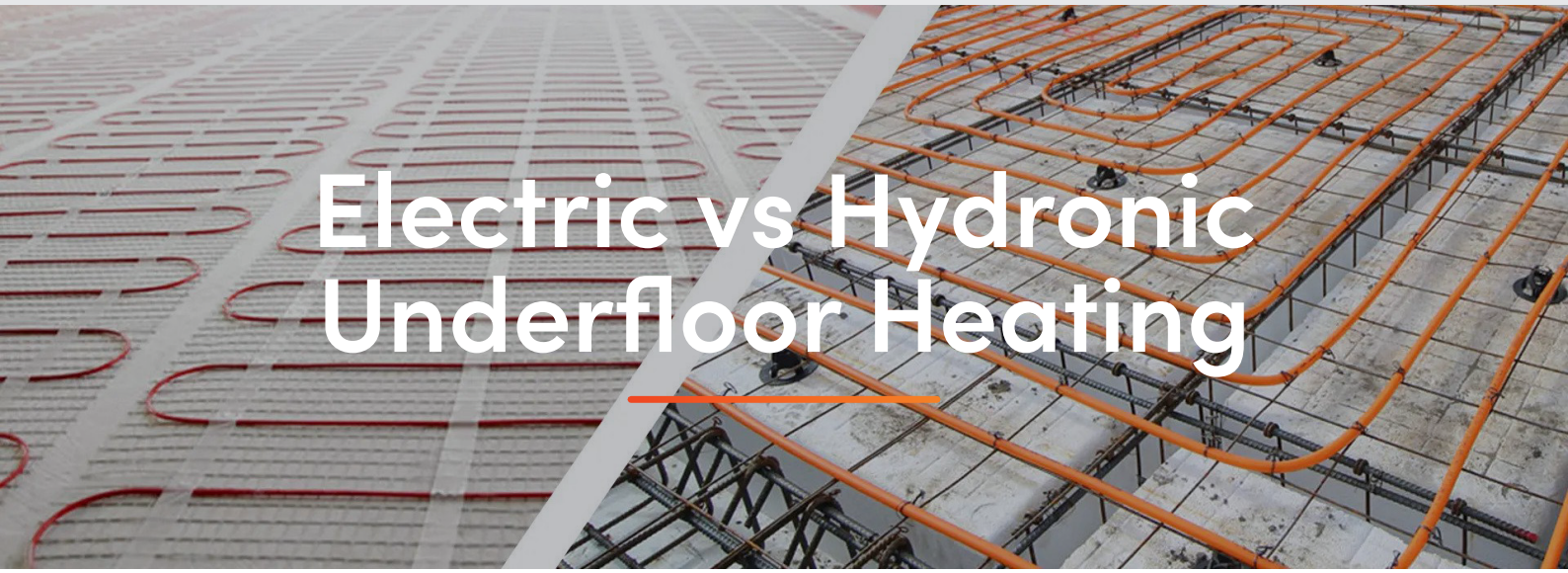

Electric vs Hydronic Underfloor Heating

Underfloor heating is the most luxurious form of heating as its radiant heat is evenly distributed throughout your home.

Hard floor surfaces are warm to the touch, there is no air being blown around it is totally silent. The system is totally hidden from view and, unlike radiators or surface-mounted heat pumps, takes up no wall space. This makes it ideal for large open-plan homes or those with lots of glazing.

There are two main forms of underfloor heating – electric and hydronic.

What is hydronic underfloor heating?

Hydronic central heating is a method of whole-home heating in which warm water circulates through a closed network of pipes, carrying heat around the home. The heat source warms the water circulated through the pipes that lead to the pipes laid in the floor for underfloor heating. Ideal for whole-home heating.

There are several different methods of hydronic underfloor such as:

- The most common is in-slab which is used in new homes or during extensive renovations. The underfloor pipe is tied to the reinforcing mesh in the construction slab before the concrete is poured and allows for quick installation.
- VarioComp is a lightweight underfloor system that can be used in both new and existing houses. The pipes used are installed in a reinforced gypsum board panel, then covered with a screed to fill the panel voids and provide a finished level for leveling compounds or floor coverings to be applied.
- Spreader plate underfloor systems can be used in new or existing homes. The aluminum spreader plates are fitted between the joists allowing for the pipe to be pressed into the spreader plate.
- EzyMix European style screed underfloor can be used in new or existing homes. Pipes are clipped to a high-density insulation base which sits on top of the construction slab, then a self-leveling EzyMix solution is then laid on the polystyrene covering the pipes.

What is electric underfloor heating?

An electric underfloor heating system consists of electric heating cables being installed beneath the floor. Electricity is then passed along the resistive cables causing them to heat up and radiate the heat into the room.

There are several different methods of electric underfloor such as:

- The in-slab heating cable is designed for installation in concrete slabs making it ideal for new homes or extensions. The heating cable is tied to the reinforcing mesh in the construction slab before the concrete is poured.
- The majority of electric underfloor systems are foil-based and are installed directly below the floor coverings.

What is the installation process?

When it comes to installing underfloor heating there are several factors required to determine the heating required for the home. Insulation, airtightness, ceiling height, window size, and incidental heat will contribute to the heat demand required for each room.

Hydronic Underfloor

The installation of a hydronic underfloor system works seamlessly alongside the construction and building of the home. Typically, with an in-slab system, pipes get laid in the custom-designed formation and tied to the reinforcing mesh before the concrete is poured. Once the concrete is poured and the construction of the house is underway, wiring for the controls is installed and then connection to the heat source is made. In the final stages of house construction, the system is tested, completed, and handed over to the homeowners with information on how to make the most of their central heating. Due to the complexity of installation certified plumbers are required for installation.

Electric Underfloor

The installation of a foil-based electric underfloor system is much simpler than a hydronic system. Typically, the install of the system can be done by an electrician, tiler, or builder and in some circumstances can be a DIY project for the homeowner. The installation process is quick and straightforward by using thin electric heating wires attached to a ready-sized mat that can be simply rolled out, adhered to the subfloor, and finished with a floor covering.

What system is more cost-effective?

Based on a hypothetical home with 180m^2 of the heated area, we analysed hydronic vs electric underfloor heating.

In as short as 3 years a hydronic system powered by an air-to-water heat pump (which is x3 cost upfront compared to electric) has saved the difference in running costs and is in fact saving the homeowner up to $4,000* a year in running costs.

Hydronic systems do require yearly servicing to ensure that all parts are working as efficiently as possible.

Hypothetical Home Criteria	
Heated Floor Area	180m^2
Heating Required	11.7kW (65W/m^2)
Electric Underfloor Heating	
Underfloor Heating	$5,400.00
Controls	$1,500.00
Total (excl GST)	**$6,900.00**
Upper Range	$8,280.00
Annual Running Costs	**$6,722.00**
Hydronic Underfloor Heating	
Underfloor Heating	$9,000.00
Controls	$1,500.00
Air-to-Water Heat Pump	$12,000.00
Total (excl GST)	**$22,500.00**
Upper Range	$27,000.00
Annual Running Costs	**$2,240.70**

Payback years of Hydronic vs. Electric Underfloor Heating
3 -4 years

*All costs are to be used as a guide only and are based on a new home. Costs are at the time of the creation of this blog post. Installation and component issues can affect the approximate capital cost of installation. All running costs take into account the thermal efficiency of the relevant heat source as independently measured by laboratory testing.

What are the Pros and Cons?

Hydronic Pros:

- Whole-home heating.
- Cheaper running costs.
- Underfloor heating and cooling technology is available.
- Set and forget mentality – you have comfort knowing your house is always warm.
- Ideal for small or large homes.
- Ideal heat distribution for the human body (warmest at the feet, coolest near the head).
- Suitable for all floor types.
- Options for new and existing homes.
- Different zones can be set different temperatures.
- Silent and healthy.
- Energy-efficient.
- Can be left on 24/7 at a desired temperature and the system will maintain that heat, can be scheduled to adjust the temperature at different times of the day.

Hydronic Cons:

- Slower heat up and cool down time (roughly 24 hours to achieve desired heat from off).
- More expensive initial cost but low running costs.
- Requires yearly servicing.

Electric Pros:

- Ideal for smaller areas of the home such as bathrooms.
- Cheaper initial cost but more expensive running costs.
- Easy installation.
- Different zones can be set different temperatures.
- Ideal heat distribution for the human body (warmest at the feet, coolest near the heat).
- Suitable for some floor types.
- Options for new and existing homes.
- Best suited on a timer system – start at a certain. time get to the desired temperature then turn off.

Electric Cons:

- Extremely expensive running costs.
- DIY installation issues.
- Not ideal for whole-home heating.
- Can't be left on 24/7, more ideal on timer for short time.

Although there are some similarities to electric and hydronic underfloor systems, they both are very different. Electric underfloor is more suitable for those who only want to heat very small areas in their homes whereas Hydronic underfloor is ideal for whole-home heating comfort. Whether you opt for electric under-tile heating or hydronic underfloor heating, radiant heat is a feeling like no other that will make your home warm and cosy all year round.