Helton Heat Exchangers

Frequently asked questions.

Q: What should I consider when purchasing a vehicle heat exchanger?

General information – How heat exchangers work.

Heat exchangers work by circulating the hot water from your vehicle cooling system through a closed copper container. Inside this container are the coils through which your fresh shower water supply passes and is heated.

The output fresh water temperature is affected by a number of factors.

- Engine temperature.
- Flow rate of engine coolant fluid.
- Efficiency of exchanger.
- Flow rate of fresh water through exchanger.
- Starting temperature of fresh water pumped through exchanger.

Consider these factors when selecting your model of exchanger.

1. Your engine temperature.
   This is the source of heat which allows the exchanger to work. The hotter the source, the hotter the output shower water.
   Petrol/ Gasoline engines and large block diesel engines are a good heat source and heat exchangers generally work well on these vehicles.
   Intercooled turbo charged engines appear to have less heat in the coolant water requiring the purchase of our Red Hot Water Unit.

2. The flow rate of your engine coolant.
   The greater the flow rate of the hot engine fluid through the exchanger, the better the heating results. Some engines need to be run at a high idle to produce enough flow in the cab heater hoses. Blocked cab heating radiators have been known to reduce the engine coolant flow to produce poor results. Flow rates can be boosted by the installation of a pump in the heater hoses. We sell these pumps but they are not usually required of Helton units.

3. Efficiency of exchanger.
   Construction and design determine an exchanger's ability to transfer heat.
   Helton Heat Exchangers are manufactured from 100% copper which has excellent heat transfer characteristics plus durability. The direction of flow through the exchanger and the length of copper transfer coil in the exchanger influence the ability of the heat exchanger to extract the heat from the engines water supply.
   The blue shower series models are the base units with about 2.8 metres of internal coil.
   The Hot Water series use a double coil design to achieve longer lengths of internal coil but still in a compact size. The standard HW (200mm long canister) unit has about 4.2 metres.

4. Flow rate of fresh water.
   The fresh water flow rate determines the volume of water being heated per minute.
Increasing the volume of fresh water flowing through an exchanger, decreases the output temperature of the shower water. Inversely, reducing the flow rate increases the temperature. The Blue Shower unit and Hot Water unit are designed for shower temperature water at a flow rate of between 3 to 4 litres a minute.

5. Fresh Water starting temperature.
A helton exchanger has been known to heat the ice water out of an ice box, but this is not expected to be every customer’s source of shower water. If you plan to be sourcing water from icy cold creeks, I recommend purchasing a Hot Water unit.

Conclusion

What are your expectations and what type of vehicle will be your heat source? Is your engine a good heat source or do you need to select a red Hot Water Unit over the cheaper blue Shower Unit?

Is water conservation an issue? What size is your water supply?
If you are crossing the desert and carting water, you will be happy with a shower of around 3 litres a minute. If you have unlimited creek water, you may want to up the anti for a hotter unit able to handle a larger output volume from a cold water source.

Do you want hot shower water in one pass or are happy to recycle your fresh water back into your storage container until the desired temperature is reached? A blue Shower Unit is suitable for a shower in one pass from a large block engine such as a Land Cruiser, but will only be suitable as a recycling system on a TDI Nissan Patrol.

Q: What’s the difference between the vehicle camping shower and the hot water system?

The blue vehicle camping shower exchanger has about 2.8 meters of heating coil and is designed to deliver shower temperature water directly from the unit. The hot water system exchanger has about 4.2 meters of heating coil and will deliver much hotter water.

Q: Where can I mount the exchanger?

Mounting the heat exchanger is not vehicle specific - they can be mounted anywhere there is space. Because the units are internally ducted, they can be mounted vertically or horizontally and any angle in between. The units are usually mounted on the firewall. Some other mounting points are inside wheel arches, on the chassis rails, under battery holders and behind the bullbar. Helton exchangers are compact size makes them easier to fit inside the modern crowded engine compartments. The mounting brackets come with a 6mm mounting bolts. Do not mount your exchanger directly on the engine. Constant vibration has the potential to cause metal fatigue and void warranty.

Q: Will fitting a heat exchanger affect my cabin heater?

No you cannot detect any difference in the output.

Q: Series or parallel fitting?

Most new vehicles have a constant flow cab heater system and series installation is easiest for these vehicles. That is, the exchanger is plumbed directly into one of the cab heater hoses.
Parallel installation using “T” pieces is appropriate if your vehicle cab heater system incorporates a water tap, usually located against fire wall in engine bay, which is operated by the cab heater controls.
In this situation, parallel installation using “T” pieces is best as no coolant water flows through the cab heater hoses with the cab heat turned off. “T” pieces are placed in both cab heater hoses, with the “T’s” then connected to the heat exchanger. Temperature control can be achieved by adjusting the cab heater controls and our kit control valve is not required in this situation.

Q: How do I control the temperature?

There are two ways of controlling the temperature output from an exchanger.
Change the fresh water flow rate or the engine coolant flow rate.
Decreasing the fresh flow rate or increasing the engine coolant flow rate will increase the shower water temperature.
Increasing the fresh water flow rate or reducing the engine coolant flow rate will reduce the shower water temperature.

The kit shower rose has a slide to reduce water flow. The hot water kit also has an in line “temperature regulation” valve to vary the engine coolant water flow.

Q: What shower temperature can I expect from my heat exchanger?

As explained in General Information, several factors influence the output of an exchanger.
Blue Shower Units are designed to achieve a shower temperature range of 38 to 42°C for shower purposes at a fresh water flow of 3 litres a minute for the camper needing to be conscious of water conservation in a situation where water is transported.
From experience, a fresh water flow rate of about 3 litres a minute is adequate for a bush shower, but less than one would expect from a shower at home.

A Red Hot Water unit is designed for a shower temperature range of 38 to 42°C on turbo charged/intercooled diesel engines at a fresh water flow of 3 litres a minute. A Red Hot Water unit has achieved 80°C from a hot running petrol engine in testing.
As it is expected the red Hot Water units will produce temperatures too hot for a shower on some vehicles, the Hot Water kits include a valve (tap) to be installed in one of the engine coolant lines. This valve can be partly closed to reduce the output to a comfortable shower temperature.

If in doubt, purchase a Hot Water unit.

Q: Manufactures Warranty?

Helton Heat Exchangers are hand crafted in Miles, Queensland, Australia from 100% silver soldered copper.
Our exchangers are very well made and expected to last a lifetime.
Exchangers are sold with a Helton replacement five (5) year warranty, against faulty manufacture.
Components in the kits other than the exchanger carry a 12 month replacement warranty.
Mounting the exchanger directly to the engine will void warranty due to constant vibration having the potential to cause metal fatigue.

Q: Specifications and configurations

Helton makes two basic models of heat exchanger being the blue and red units.
The units are manufactured with all 4 hose connections at one end.
Both units are a 76mm diameter canister, 200mm long plus 35mm long hose connections.
A bare shower exchanger weighs about 1.45 kg and Hot Water exchanger 1.9kg.
Q: What is in a kit?

A red Hot Water kit includes:

1 hot water unit, 2 mounting brackets, 2 metres of 16mm Heater hose, 3 metres of 10mm Fresh water hose, Bracket for bumper with inlet and outlet barbs, suction hose strainer, 12 Hose clamps, Temperature regulation valve, 12v Johnson “AquaJet Mini” diaphragm pump, wiring harness with fuse holder and marine grade water proof switch, “Turbo” shower rose with hose, Zip ties and DIY instruction sheet.

A blue shower water kit includes:

1 blue shower unit, 2 mounting brackets, 2 metres of 16mm Heater hose, 3 metres of 10mm Fresh water hose, Bracket for bumper with inlet and outlet barbs, suction hose strainer, 10 Hose clamps, 12v Johnson “AquaJet Mini” diaphragm pump, wiring harness with fuse holder and marine grade water proof switch, “Turbo” shower rose with hose, Zip ties and DIY instruction sheet.

Q: If the exchanger runs dry, will it be damaged?

The exchanger is permanently connected to the engine cabin hoses. When not in use, the fresh water side usually siphons dry. This does not affect the unit. The Johnson pump is self priming. It is wise to check the engine cooling hoses for serviceability as often as you check your radiator hoses.

About Us

Helton has been manufacturing heat exchangers for on vehicle shower systems since 1990. From a keen interest in camping and the desire for a good hot shower in the bush, the first blue shower unit originated.

Fellow campers wanted one too, and from the week-end camping trips the business has grown from national sales to exporting to England, Ireland, Spain, France, Germany, Russia, United States, Canada, New Zealand, United Arab Emirates, West Indies and Israel.

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