

HV COOLANT HEATER TECHNICAL SALES NOTES GENERATION 3



High voltage PTC heater that uses an external heat demand to produce a user specified heat power from 0 to 5kW. The heater does not automatically maintain water temperature in the coolant circuit, it responds to user demand.

Heater is used to replace heat source (IC engine) for HVAC heater matrix when used on electric vehicle or to provide heat source when in electric mode on a hybrid vehicle.

- 30% lighter than Generation 1.
- 25% more power than Generation 1 (@60°C coolant temperature).

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HV COOLANT HEATER TECHNICAL SALES NOTES

GENERATION 3



1. High voltage PTC heater that uses an external %heat demand to produce a user specified heat power from 0 to 5kW @60°C. The heater does not automatically maintain water temperature in the coolant circuit, it responds to user demand.
2. Heater is used to replace heat source (IC engine) for HVAC heater matrix when used on electric vehicle or to provide heat source when in electric mode on a hybrid vehicle.
3. 7 wires to the heater
 - a. HV+ (250-450VDC), typ 350V DC.
 - b. HV-.
 - c. Interlock - In.
 - d. Interlock - Out.
 - e. 12V+ (9-16V range), typ 13.2V DC.
 - f. 0v (from low voltage 12V supply).
 - g. LIN signal for control - LIN 2.1.

Heater is supplied with high voltage connector HV2+2 180° Hirschmann and low voltage connector seal star 8 pin Hirschmann.

4. Interlock (passive) is used to sense if the connector is disconnected so high voltage is not available at the connector for safety. The interlock is a simple continuity loop.
5. HV supply to heater needs fusing, recommendation is 40A.
6. No water pump is supplied as part of the heater, but can be if required; inlet/outlet of heater is dia 20mm. 5-30L/min is required (see Ancillary Options).
7. Inlet and outlet connection are not interchangeable.
8. Any orientation for the heater, avoid mounting at top of water circuit as air lock likely. Heater will run and control itself even in the absence of water.
9. IP69 allows any location chassis mounting.
10. This is the standard V1.3 (GEN3) heater; there are no options available on the heater. There are other heater options that use CAN connectivity, but are not standard and expensive to develop for customer, so unlikely to be available unless volume production.

11. Automotive pedigree, the specification details the comprehensive suite of tests that have been carried out on the heater that are typical of large OEM supply.
12. Safety; a PTC style heater is inherently safer than a resistive element such that a heater can be run with no water in it for hours/days and it will regulate itself both as a function of the PTC element where self heating reduces power demand and also on board temperature sensing on the internal control pcb limits power and eventually turns heater off where as a resistive element potential carries on at full power.
13. On board electronic control allows comprehensive suite of fault detection including watchdog function on micro controller, over current and short circuit detection. If current >30A for more 80ms or >20A for 3-5 seconds then automatic power reduction.
14. Diagnostic Trouble Codes (DTC's) through LIN connection to enable constant monitoring and fault diagnostics.
15. Heater has 3 separate heater banks. Selection of heater % demand activates combination of heater banks to achieve value required.
16. Regulation, the external heat demand enables the vehicle to limit the power demand of the heater so for instance if the battery is getting low it is possible to limit the power draw where as the typical competitive heaters are either on or off.
17. The heater can also be used for the HV dissipation of the vehicle HV circuit, i.e. turning heater on once HV has been switched off on the vehicle allows the heater to 'drain' the HV from the electrical circuit of the vehicle so allows safe working on the vehicle.
18. To reduce start up current the heater output increases at a rate of 140ms per % demand, so 14 seconds to achieve full output.

ANCILLARY OPTIONS

- Water pump: A 12V DC water pump (P/N 25 2526 25 00 00) is available rated at 720L/hour.

Other pumps in 12V and 24V DC are available on request.