



Heater to Prevent Water Valve Freezing on Firetrucks

WiSys: T200035US02

Inventors: Colin Feuster

WiSys is currently seeking strategic partners in the manufacturing of firetrucks and water valves who could provide a route to market for the commercialization of this novel valve heater.

Overview

A core function of firetrucks and tenders are to haul initial water to an emergency and often serve as a sole source when water is not nearby from a hydrant or other source. As part of their key roles in public safety, firetrucks process an immense amount of water through a series of tanks, pumps, and valves. At least three-quarters of the United States face freezing temperatures at some point throughout a given year. Therefore, most firetrucks in operation will see either very cold to freezing water, below freezing or frigid air, or both. The need for fully-functioning water valves and trustworthy equipment cannot be overstated in an emergency situation. There is an abundance of guidance on maintenance and cold weather operations and some solutions are currently in practice. The built-in solutions on firetrucks currently on the market include pump house heaters or the application of heating tape, but mostly do not address the valves directly. It is common for firefighters to use a blow torch to manually thaw valves or apply electric blankets or manual valve heaters on site. There is currently no solution on the market that is embedded in the firetruck itself or does not require the use of additional cold-weather protocols.

The Invention

An alumnus of the University of Wisconsin-Stout has developed a new electric heater for water valves that can be incorporated directly into a firetruck's valve housing and the controls of the truck so that it can be switched on/off and temperature regulated from within the cabin. A prototype has been developed that makes use of a flange to provide a protected location for an electrical resistance heater on the valve itself and that takes advantage of the high thermal conductivity of the metal valve bodies. It demonstrates how electrical heating of a water valve using a heater associated with the water valve flange can significantly reduce freezing of outlet valves during cold weather use. The cumbersome heating blankets that are prone to damage or interfere with valve operation or the hose coupling are eliminated. Best of all, this heater can be used with these high-capacity valves despite the rapid cooling that can occur with flowing water and exposure of the valve body to frigid air.

Applications

- Can be incorporated onto any fire engine, tender, or other truck with a water valve;
- Works with irregular shaped valves.

Key Benefits

- Simply integrates into existing systems without additional plumbing, new valves or extensive insulation;
- Reduces the need for additional time-consuming protocols to keep water valves from freezing;
- Accommodates both wet and dry pump operations;
- Reduces risk of freezing with leaking valves;
- Does not interfere with valve usage;
- Resistant to damage and water retention.

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Stage of Development

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Tech Fields

- [Engineering : Engine technologies](#)
- [Engineering : Power electronics & control systems](#)

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