

HEATER TO PREVENT WATER VALVE FREEZING ON FIRETRUCKS

Market and Background

Firefighting is currently served throughout the United States by career, paid-on-call, and volunteer departments. While largely dependent on state and local governments for financing, there is revenue potential in firetruck manufacturing up to (USD) \$2 billion. One of the core functions of firetrucks and tenders is to haul initial water to an emergency and transfer the water through onboard pumps to the firefighting nozzles.

As part of their key roles in public safety, firetrucks process an immense amount of water via their onboard tanks, centrifugal pump, and valves. At least 75% of fire departments the United States face freezing temperatures at some point throughout a given year, which makes their apparatus susceptible to damage caused by freezing water. 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 practiced. The built-in solutions on firetrucks currently on the market include pump house heaters and heated gauges that do not address the valves directly. It is commonly said that “moving water does not freeze”, but there are numerous points on both firetrucks and tenders where moving water is not an option. Firefighters often use a blow torch to manually thaw valves or apply electric blankets on site. There is currently no solution on the market that is embedded in the firetruck itself, is automatic, or does not require the use of additional cold-weather protocols.

Research and Development Status:

An alumnus of the University of Wisconsin-Stout has developed a new self-regulating electric heater for water valves that can be incorporated directly into a firetruck’s valve housing. The prototype 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 brass valve bodies. It demonstrates how electrical heating of a water valve using a heater associated with the water valve flange can significantly reduce freezing and damage caused by swelling of valves during cold weather use. A temperature sensor communicates with the controller to switch electric power to the heater element. Because of a lower maximum temperature for these self-regulating heaters, there is no additional thermostat or temperature controller needed, and there is no risk of damaged seals, equipment, or personnel being burned.

Applications and Key Benefits:

- Can be incorporated onto any fire engine, tender, or other truck with a water valve
- 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
- Modular design allows adaption to various and irregular-sized ball valves, butterfly valves, and drain valves
- Heaters are controlled by a thermostat mounted to the pump panel that senses low ambient temperature to automatically switch on with no human intervention needed
- Accommodates both dry and wet pump operations
- Does not interfere with valve use
- Resistant to damage and water retention

Intellectual Property:

A patent application is pending for this technology. For more information, please contact our licensing team at licensing@wisys.org.

Development and Commercialization Needs:

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.