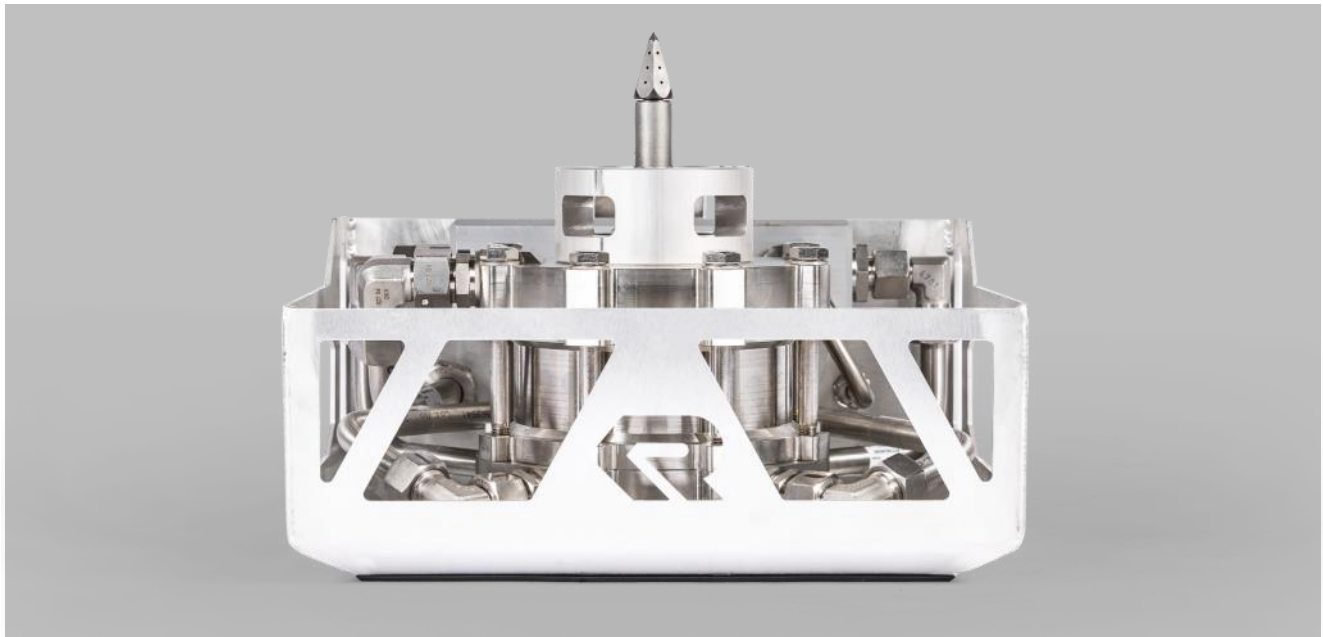


RFC Battery extinguishing system

Extinguishing system for batteries of EV or PHEV vehicles



Description

The Rosenbauer extinguishing system for high-voltage batteries in electric vehicles is a system for the safe, efficient and fast extinguishing of batteries based on lithium-ion technology. It enables direct cooling of the battery modules, or the cells within the modules and thus a quick stop of the propagation of the thermal runaway of the cells.

The system consists of two main components - the extinguishing unit and the operating unit, which are connected to one another with hoses. The extinguishing unit is positioned on the battery and - if necessary - jacked on the car body or other points. The preferred position of the extinguishing unit is on the underside of the vehicle. The operating unit triggers the penetration of the piercing tool into the battery housing from a safe distance away. Immediately after piercing, the battery housing is flooded with water and the efficient cooling process starts.

Advantages

Safe

- The firefighters only spend a short period of time in the direct vicinity of the electric vehicle to be extinguished. This short time near the vehicle reduces the risk of contamination with the smoke gas constituents if the battery is evaporating gas.

Efficient

- The extinguishing system brings the extinguishing water exactly where it is needed - to cool the cells and modules in the battery housing. This means that extinguishing is very resource-saving and the spread of smoke gases is reduced to a minimum.

Fast penetration

- Thanks to the special penetration method of the piercing tool, all currently known and tested battery housings can be safely penetrated.

Self-sufficient

- The energy required for penetration is provided by compressed air cylinders.

Tested under real conditions

- During the research and development, numerous fire tests were carried out with a large number of battery systems and complete vehicles. The system was tested on all common cell types (round, pouch or prismatic cells) in the platforms of European and American cars and trucks. The batteries tested had a capacity of up to 120 kWh.

Proven in practice

- Factory, professional and voluntary fire brigades in Europe have been testing the extinguishing system for months and are providing important feedback from practice.

Normal pressure extinguishing system



- The extinguishing system only needs water with a pressure of 60-150 psi as an extinguishing medium. This means that every existing normal pressure extinguishing system can be used.
- Extinguishing water is fed in via a NST male connection or other compatible hose couplings on the hose line.

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Use of the extinguishing system

- 1) In the event of a fire of an electric vehicle, the battery itself is not necessarily affected by the fire. Therefore, the vehicle itself has to be extinguished first. If the battery itself is not yet affected, fighting the vehicle fire and cooling the battery from the outside is sufficient.
- 2) If there are clear signs that the battery itself is affected, the Rosenbauer battery extinguishing system should be used as quickly as possible.
The following indicators can indicate a battery on fire:
 - a) Smoke from the area of the battery (depending on where the battery is installed)
 - b) Jet flame from the area of the battery
 - c) Characteristic noise of individual cells during thermal runaway (bang, whistling, hissing)
 - d) Increased temperature (also selectively) on the battery housing - measured by a thermal imaging camera
- 3) The extinguishing unit is positioned on the battery. The preferred position of the system is under the vehicle, as this is where the battery can be penetrated quickly and directly. If necessary, the vehicle can be raised with a jack or a hydraulic spreader, for example. When penetrating via the cabin or trunk (e.g. on plug-in vehicles) the extinguishing unit is supported on the car body. This can be done quickly, e.g. using continuously adjustable supports or a hydraulic rescue ram.
- 4) The water supply should be prepared parallel to the positioning of the extinguishing unit. The nominal pressure of the system is 100 psi. The water supply can be from fire trucks or portable pumps as well as directly from hydrants.
- 5) Open the compressed air bottles on the control unit and activate the piercing tool. Immediately after penetration, the battery housing begins to be flooded, and with it the desired cooling process. The success of the cooling has to be checked regularly e.g. with thermal imaging camera.
- 6) The flushing time depends on the size and architecture of the battery and can be between 10 and 60 minutes.

Technical data

Water flow	8 gal/min at 100 psi Flow range from 6,6 gal at 60 psi up to 13 gal at 215 psi
Length hose	315 in as standard
Air supply	2x 0,26 gal / 4350 psi
Weight ext. unit	Approx. 46,3 lb
Weight control unit	Approx. 48,5 lb
Weight hose package	Approx. 52,9 lb

Extinguishing unit



Control unit



Contact

Daco Fire Equipment
201 Ave R
Lubbock, TX 79415
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www.dacofire.com

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