



RFC battery extinguishing system

**Extinguishing system
for batteries of EV
or PHEV vehicles.**

**Star International has partnered with
Rosenbauer to offer an extinguishing
system for high voltage batteries.**

This allows the safe, efficient and fast extinguishing of batteries based on lithium-ion technology and 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

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 4-10 bar as an extinguishing medium. This means that every existing normal pressure extinguishing system can be used.

Extinguishing water is fed in via a Storz C connection or other compatible hose couplings on the extinguishing hose line.

Use of the extinguishing system

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.

If there are clear signs that the battery itself is affected, the Star Battery Extinguishing System should be used as quickly as possible.

The following indicators can indicate a battery on fire:

- Smoke from the area of the battery (depending on where the battery is installed)
- Jet flame from the area of the battery
- Characteristic noise of individual cells during thermal runaway (bang, whistling, hissing)
- Increased temperature (also selectively) on the battery housing - measured by a thermal imaging camera

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. The ship's crew should also activate the surrounding area drenching system to cool nearby vehicles.

The water supply should be prepared parallel to the positioning of the extinguishing unit. The nominal

pressure of the system is 7 bar. The water supply can be directly from the ship's fire hydrants.

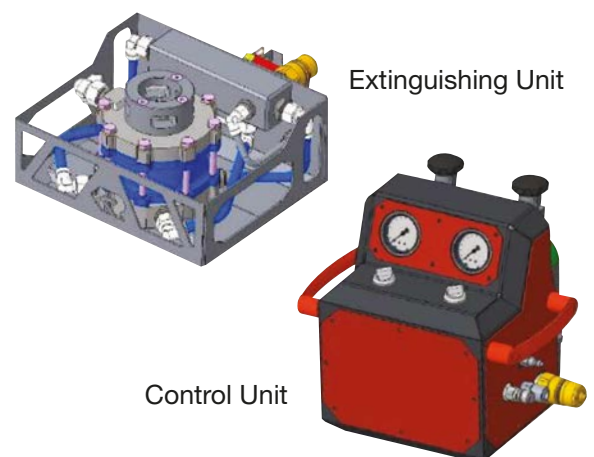
Open the compressed air bottles on the control unit and activate the piercing tool. Immediately after penetration, the battery housing begins to be flooded, and with it the desired cooling process. The success of the cooling has to be checked regularly e.g. with thermal imaging camera.

The flushing time depends on the size and architecture of the battery and can be between 10 and 60 minutes.



Technical Data

Hose length	8 m as standard (315in)
Air supply	2x11/300 bar (0.26 gal/4350 psi)
Weight ext. unit	Approx. 20 kg (44 lb)
Weight control unit	Approx. 20 kg (44 lb)
Weight hose package	Approx. 20 kg (44 lb)
Water flow	30 l/min at 7 bar. (8 gal/min at 100 psi) Flow range from 25 l/min at 4 bar (6.6 gal at 60 psi) up to 50 l/min at 15 bar (13 gal at 215 psi).



Star International

Head Office: Star House, Turbine Business Park, Turbine Road, Birkenhead, Merseyside, CH41 9BA, United Kingdom.

Tel: +44 (0) 1244 504 500
Email: enquiries@star-international.co.uk
Web: www.star-international.co.uk