

battery.cooling

COOLING SYSTEMS FOR LITHIUM-ION BATTERIES

Battery cooling in electric vehicles is of vital importance for the function and service life of the high-performance batteries used. In electromobility, the optimum operating temperature must therefore be guaranteed both in the vehicle and in stationary energy storage systems with the aid of high-performance cooling. A constant, unvarying temperature profile of the lithium-ion battery is vital for ensuring long-term performance.

Reliable and safe cooling of lithium-ion batteries

Charging processes of batteries generate heat loss during energy conversion, which influences the performance of the energy storage devices. Efficient cooling using water-glycol circuits ensures optimum battery temperatures and long-term stability. **technotrans** tailors its established battery cooling systems for electric cars and electric buses or electric rail vehicles to individual applications. This allows us to achieve optimum battery life and performance and increase the efficiency for electric mobility. Hybrid or electric vehicles as well as electric trams or trains can be equipped with technotrans battery cooling systems.

ADDITIONAL SERVICES

- > product development and manufacturing refer to relevant standards in mobile applications
- > full service of required environmental tests
- > wide range of international accreditations & certificates e.g. UL

INTERNATIONAL SERVICES

- > 6 manufacturing & 16 service sites worldwide
- > 24/7 customer support with spare parts dispatch "follow the sun"
- > approx. 150 service technicians in the field

ABOUT TECHNOTRANS

For more than 40 years the **technotrans** group is a strong and competent partner for cooling, temperature control and filtration and offers high-quality system solutions for a wide range of industries like laser, tooling, graphic and also energy storage. With **termotek** GmbH and **klh** Kältetechnik GmbH, **technotrans** reinforces its competence as system supplier for refrigeration technology. The enhanced portfolio offers not only standard systems from 0.1 to 500 kW, but also includes customized solutions.

technotrans customers use the 21 service and sales companies of the corporation worldwide, comprising more than 1,380 employees, to ensure the satisfaction of their own international clientele.

technotrans refrigeration systems – proven technology

The **technotrans** Customer Service Support can be reached around the clock. Over 200,000 spare parts are available worldwide and can be on customer site within 24 hours.



Please do not hesitate to get in touch with our experts for further information.

Member of
the **technotrans** group

☒ **technotrans**
☒ **gds**
☒ **termotek**
☒ **klh**
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☒ **technotrans**

SPECIFIC COOLING CONCEPTS

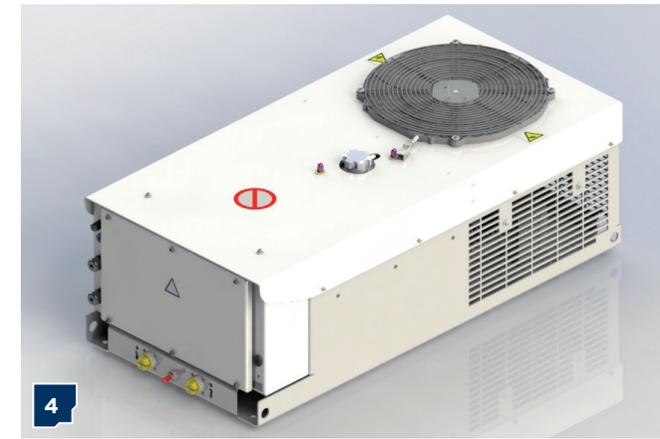
- › active cooling by using refrigerant compressor
- › passive water cooling to ambient air
- › active air cooling by refrigerant compressors
- › indirect air cooling via cooling water circuit
- › direct cooling with cooling plates
- › combination of cooling concepts in multi-circuit systems
- › optional: in combination with heating systems, e.g. on energy-efficient heating using heat pump

TECHNICAL FEATURES

- › wide range of serial units
- › customized solutions
- › standardized design for E-bus, trolleybus and tram applications
- › cooling capacity from 500 W up to 45 kW
- › wide range of voltage variations: e.g. 24 VDC, 400 VAC, 600 VDC
- › for climatic conditions between -25°C and $+55^{\circ}\text{C}$
- › optional as multi-circuit system (such as battery and traction system)
- › communication interface for BMS control (e.g. CAN bus)



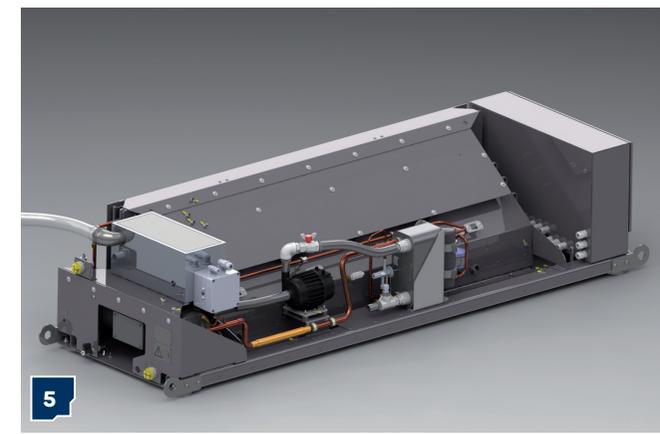
1



4



2



5



3



6

- 1 serial unit for battery cooling of E-busses, zeta.road X3
- 2 serial unit for battery cooling of trains and trams
- 3 customized battery cooling adapted to the application

- 4 serial unit for battery cooling for E-busses, zeta.road X4
- 5 battery cooling for underfloor installation
- 6 customized battery cooling for roof mounting for regional trains