



SMART TECHNOLOGY FOR SMARTER MOBILITY

PRESS RELEASE

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Valeo at Busworld Europe 2023 to present its sustainable thermal management solutions - Hall 6 booth 609

From October 7 to 12, 2023, Valeo will be at **Busworld Europe**, the world's largest event for buses and coaches taking place in Brussels, to showcase its innovative thermal management technologies for buses of all sizes and drive types.

Valeo is committed to developing solutions for greener mobility and a world leader in technologies to reduce CO2 emissions and improve comfort on board for buses and coaches. At Busworld Europe 2023, Valeo will focus on thermal management systems for buses worldwide - thermal comfort without compromise, maximum safety and fleet-efficient solutions with zero emissions.

The shift towards low-carbon mobility and subsequent fast growing market share of electrically powered buses has a significant impact on vehicle development and powertrain-related systems, including the heating and air conditioning systems.



The fast-growing electrification of mobility – particularly in public transport – requires high-performance mobile energy storage systems that enhance travel comfort. In Brussels, Valeo will showcase its **E-Cooler** solution, allowing a range of **battery temperature management** models with a maximum cooling capacity of 10 kW, an optimal solution for a wide range of applications. Depending on the requirement, the E-Cooler protects the battery from overheating during charging and discharging, cools it while driving at higher outside temperatures and heavy loads. An

additional heating function even warms up the sensitive batteries if necessary to restore the optimum temperature range.

Moreover, with limited electrical energy available from traction batteries, innovative and efficient HVAC solutions for buses are needed. A strategic leader in this market, Valeo's innovations provide a comfortable interior climate for passengers and efficient solutions for fleet owners whatever the weather conditions, the size of the vehicle, its powertrain type, the mode (urban, suburban or long-distance) and the duration of the journey.



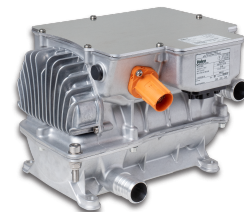
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The all-electric rooftop air conditioner REVO®-E HP R744, Valeo's latest air conditioning system for buses with alternative engines will be presented at Busworld 2023. With a compact, reversible heat pump, this system cools and heats the interior of the electric vehicle efficiently and with low energy consumption. The unique dynamic de-icing on demand enables energy-saving heat pump operation even at cold outside temperatures lower than 5°C. The system is operated with the natural refrigerant R744. The chemical properties of this refrigerant and the specially developed control system enable it to be used at ambient temperatures from -20° to +50°C. The electronic control includes a holistic thermal management with its own developed software, which always operates the system at the optimal operating point. This means that the cooling/heating capacity is generated according to demand and available energy, so that the maximum coefficient of performance is always achieved.



The system impresses with a further significant reduction in noise emissions and weight, as well as a simplified refrigeration circuit. The integration of the compressor made it possible to achieve a compact system design, low refrigerant charge and low energy consumption. The refrigerant circuit is maintenance-free, durable components ensure low life cycle costs. The integrated battery cooling module keeps the battery at a constant temperature, which extends its service life and ensures greater efficiency. The new REVO®-E HP R744 has the same interface as Valeo's REVO® classic system. For the vehicle manufacturer, this offers the greatest possible flexibility in installation and product mix. The system is a "plug & play" unit that can even be delivered to the customer pre-filled.

The technologies developed by Valeo ensure the right air flows while consuming a minimum of energy and using recoverable energy. Bus air-conditioning specialist and pioneer in e-heating, Valeo will be presenting a **high-voltage heater for electric buses that steplessly regulates the heat output via an integrated control unit**. This is done either by controlling the water outlet temperature or by limiting the maximum heating output or power consumption. With this function, the high-voltage heater Thermo HV, which has been in series production since June 2023, can also be actively integrated into the thermal management of the vehicle and the overall efficiency of the system can be increased. With a voltage range of 450-850 VDC, the Thermo HV provides a consistently high heat output of 12kW. Its 12kW/800V model is considered unrivaled. In addition, it is CAN-capable and transmits important operating data to the vehicle system via an intelligent diagnostic function.





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Valeo has become a leading manufacturer of high-end water pumps, covering a wide range of applications, for buses and trucks, agricultural and construction machinery, off-highway and commercial vehicles. Also displayed in the Valeo booth, the smart **SPump family** will present the best solution for **almost any application with cooling or heating circuits in the vehicle interior or for components**, e.g. batteries. Versions with PWM and CAN feature variable speed control, save energy, reduce noise emission and always provide outstanding performance required for electrically powered vehicles. The SPump S120 and S200 are the lightest weight and most compact circulation pumps of their kind within the product family. The 500W variant impresses with a high flow rate at high counter pressure. With an extended ambient temperature range of up to 95°C at the highest level of reliability, the SPump is the best solution for water pumps in comfort application and component cooling worldwide.

All these innovations are controlled by electronic and software programs developed by Valeo, that always operate the system at the optimal operating point, to ensure that existing energy resources are put to the best use, thereby significantly extending the range of electric buses.

About Valeo

As a technology company and partner to all automakers and new mobility players, Valeo is innovating to make mobility cleaner, safer and smarter. Valeo enjoys technological and industrial leadership in electrification, driving assistance systems, reinvention of the interior experience and lighting everywhere. These four areas, vital to the transformation of mobility, are the Group's growth drivers.

Valeo in figures: 20 billion euros in sales in 2022 ; 109,900 employees at December 31, 2022 ; 29 countries, 183 plants, 21 research centers, 44 development centers, 18 distribution platforms.

With its Thermal Business Valeo has a leading position in the bus market, developing and manufacturing customized A/C and heating systems, roof hatches and smart electronic control units.

Valeo is listed on the Paris Stock Exchange

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