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TECHNIK SERVICE NEWS

PUBLIC TRANSPORT COURIER | ISSUE 01.18



TITELSTORY

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SHORT OF
REFRIGERANT?

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Dear Readers,

We are pleased to present this first issue of Technik Service News in the Valeo colours. Since our last major trade fair appearance in Kortrijk we have consistently implemented our new corporate design (more on page 6). Behind the new look, however, stands a familiar team that will continue in future to be a reliable partner to the bus industry.

Today we are faced with new challenges, particularly with respect to the imminent move to electromobility. With the strength and backing of Valeo we have created a sound basis for promoting future technologies and innovations in the field of bus air conditioning and system solutions for complete thermal management in the electrobus. Our latest innovations and products will be showcased at this year's IAA Commercial Vehicles in Hanover. For the first time we will be exhibiting our newest bus air conditioning products together with the Valeo Group at **Stand A31 in Hall 16** (more on page 5).

We will also be presenting our latest developments on the Thermo plus heater and demonstrating how to heat efficiently at extremely low outside temperatures of below 0 °C with heat pump technology.

Last but not least, we want to provide you with detailed instructions for installing the new gas regulator as a replacement in the Thermo G heater as well as existing GBW applications (more on page 14).

The Valeo Team looks forward to receiving your input at IAA Commercial Vehicles in Hanover and hopes you will enjoy reading the latest issue of Technik Service News!

Frank Färber

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The “phase down” prescribed in the F-gas Regulation, i.e. a reduction in the so-called CO₂ equivalent of all produced refrigerants, has had a serious impact on the availability of refrigerants.

ARE WE RUNNING SHORT OF REFRIGERANT?

Since the Kyoto Protocol was signed in 1997, regular climate conferences have taken place at which the participating states decide on measures designed to reduce worldwide emissions of greenhouse gases. The resolutions adopted are implemented by the signatories in national law and may have far-reaching consequences.

In Europe this resulted in Directive 2006/40/EC, aimed at reducing the emission of greenhouse gases from motor vehicle air conditioning systems. As a consequence of this directive, since January 2017 such systems may no longer be filled with the refrigerant R134a. A further climate goal is to be achieved with the so-called F-gas Regulation. The latter specifies concrete measures and even a ban on air conditioning and cooling systems. This should likewise contribute to a reduction in refrigerant emissions with a high greenhouse potential. To date, none of these regulations has been effective where buses are concerned, i.e. the refrigerant R134a with a so-called GWP (global warming potential) of 1430, or even R407c with a GWP of 2110, may still be used in bus air conditioning systems. However, the prices for conventional refrigerants continue to increase and customers

have been warned that there may be substantial bottlenecks in delivery. The reason lies in the so-called “phase down” – a gradual reduction in the amount of refrigerant supplied to the market as prescribed in the F-gas Regulation (see Fig. 1).

This “phase down” is not about a global cut in refrigerant quantities, but a reduction in the so-called CO₂ equivalent of all refrigerants produced. Manufacturers and importers are faced with the choice of either reducing the quantity,

or converting to refrigerants with lower GWP values. Since no manufacturer is willing to take a cut in revenue, only small quantities of the previous refrigerants are being produced and sold at a high price.



Fig 1: Reduced amounts of refrigerant according to the F-gas Regulation.



Since 1 January 2018 only 63% of the former CO2 equivalent may be brought onto the market.

The first 7% reduction in 2016 did not have any noticeable consequences for the bus air conditioning industry. On the one hand, this was because the dealers had readied themselves by accumulating substantial stocks, so that in some cases prices even fell. On the other hand, Directive 2006/40/EC, applicable to motor vehicles, had an increasing effect, reducing the demand for R134a.

The second reduction, however, has had a considerable impact. Since 1 January 2018, only 63% of the former CO2 equivalent may be marketed. Manufacturers, and thus air conditioning specialists, have been compelled to convert to refrigerants with lower GWP values. But what are these, and what are the options for bus air conditioning systems?

For many years, efforts have been underway to introduce the natural refrigerant CO2 with a GWP value of 1. While CO2 has become established in stationary cooling systems, to date the technical challenges in mobile use have not truly been solved. On account of the high system pressure, CO2 can only be handled by hermetically sealed systems. Furthermore, CO2 is only

energy-efficient at low and moderate ambient temperatures, preventing it from becoming a global solution. However, CO2 holds high potential for electrobuses in cold regions, where the air conditioning system is also used as a heat pump for heating. Development work on these systems is already running at full speed.

Since January 2017, only the refrigerant R1234yf may be used in private motor vehicles in the EU. The latter has a GWP value of 4, according to recent studies even less than 1. However, it is the subject of controversy, because it is claimed to be flammable, and highly toxic compounds such as hydrofluoric acid are released during combustion. Nevertheless, a fear of this refrigerant is unfounded, as it is only slightly flammable and by no means comparable with highly flammable gases such as propane. Furthermore, in the case of fire hydrofluoric acid is released even by

conventional refrigerants, a fact that has as yet to be recognised. More than 40 million cars worldwide now run with the new refrigerant, and no case is known where the refrigerant has caused damage to the vehicle or injury to a human being. With additional safety measures, R1234yf could also be used in buses, and in the long term there is no alternative to this refrigerant.

There are an increasing number of refrigerant mixtures that can be implemented as a measure to reduce the CO2 equivalent. For a/c systems that were previously operated with R134a this includes the refrigerant R513a – a blend of 44% R134a and 56% R1234yf. The refrigerant R450a, a blend of 42% R134a and 58% R1234ze, offers a further possible alternative to R134a. Firstly, a blend of two refrigerants reduces the GWP from 1430 (pure R134a) by about 43% to 631, enabling manufacturers to comply with the quotas by the end

of 2023 with the same amount. Secondly, compared to R1234yf the blend is no longer flammable, by which the last doubts concerning this refrigerant should be dispelled. From a technical point of view, it must be noted that when R1234yf, R513a or R450a is used, refrigerant hoses with a nominal width of 16 to 32 must be replaced by a new hose type.

R134a is still available at a lower cost than possible alternatives (see Table 1), but the demise of R134a is predicted within the next two years. A solution to the R134a bottleneck is conversion to R513a and R450a. While over 40 million cars are on the road worldwide, in the long term there will be no alternative to converting bus a/c systems to R1234yf. In contrast, CO2 will prevail for electrobuses in moderate climate zones.

Refrigerant	R134a	R513A	R1234yf
GWP	1430	573	4
Price €/kg (15 kg cylinder, January 2018)	18,50	25,25	95,00

Table 1: Possible refrigerants for bus air conditioning systems.

FRANK FÄRBER APPOINTED HEAD OF SALES TBS EUROPE

When Carsten Schmidt became Executive Director of Valeo TBS Germany at the end of last year, Frank Färber moved up into the position of Head of Sales Europe TBS with effect from 05.12.2017.



In his new capacity he is responsible for the expansion of European OEM and after-sales. "I am looking forward to the challenges posed to Valeo Thermal Bus by the market environment in the age of digitization and electromobility. Together with the customers I want to develop sustainable solutions in the long term and put these into series production. In addition, it is important for me to prepare Service for the seamless conversion from diesel to the electrobus – a trend that is meanwhile unstoppable," says the new Sales Manager.

Färber has been with the company since 2014, and was most recently head of after-sales at Valeo Thermal Bus Systems. In previous years, as regional sales manager he was responsible for the Benelux and UK markets. Previous to his employment at Valeo, Färber held the position of customer project manager for international customers at Webasto Thermo & Comfort SE in the heavy duty division and prior to that product manager for air conditioning products.

IAA 2018 – WITH THE VALEO GROUP IN THE HALL WITH THE "BIG PLAYERS"

From 20–27 September Valeo will be exhibiting its latest products and future concepts at IAA Commercial Vehicles in Hanover. Together with the Valeo Group, the Thermal Bus systems division will showcase its new products and innovations for bus air conditioning at [Stand A31 in Hall 16](#). Here, the new REVO-E pro standalone air conditioning and heat pump solution for heating and cooling electrobuses (at outside temperature as low as -15° C) is to be presented to the public for the first time.

The pressure exerted on mobility service providers to convert to local emission-free operation is more

intense than ever. With the REVO-E pro electric rooftop air conditioning units featuring heat pump tech-

nology, which will be celebrating a world premiere at this year's IAA Commercial Vehicles in Hanover, the company will be demonstrating how to efficiently heat electrobuses, even at low outside temperatures. Thanks to the virtual icing sensor and a fully automatic hot gas defrosting with energy-optimized defrosting time, the new a/c unit can be operated with any refrigerant at outside temperatures of up to -15° C. In conjunction with the Valeo SC 620 control unit it is a real standalone solution, i.e. all a/c and control components are compactly integrated into the system, and the control concept

is uncoupled from the on-board systems. The new a/c system can thus be implemented in virtually any bus worldwide, regardless of vehicle design.

In addition, the TBS (Thermal Bus Systems) division will be exhibiting powerful HVAC components such as the reduced-emission Thermo plus heater, which thanks to its unrivalled low emission values is ideal for use in the electrobus (more about Thermo plus on page 9), as well as its SPump pump generation with the new PWM and CAN versions (more about the SPump on page 11).





Valeo Thermal Commercial Vehicles GmbH in Gilching.



Trade fair presentation at busworld 2017.

Valeo Thermal Commercial Vehicles

THE NEW THERMAL BUS UNIT IN THE VALEO GROUP

More than two years ago automotive supplier Valeo acquired the former Spheros Group. The renaming of Spheros GmbH into Valeo Thermal Commercial Vehicles GmbH took place in July 2017.

As an automotive supplier, Valeo is partner to car and commercial vehicle manufacturers all over the world. The technology company supplies innovative products and systems for the reduction of CO2 emissions and promotion of intuitive driving.

At busworld Kortrijk in October last year Valeo's new Thermal Bus unit presented itself for the first time under the new name and with the corresponding corporate image. Based on Valeo's corporate design guidelines, particular emphasis was placed on the design of a Valeo bus world that integrates the former Spheros values. With new name and look, Valeo Thermal Commercial Vehicles thus remains a reliable partner to the bus industry.

Under the umbrella of Valeo

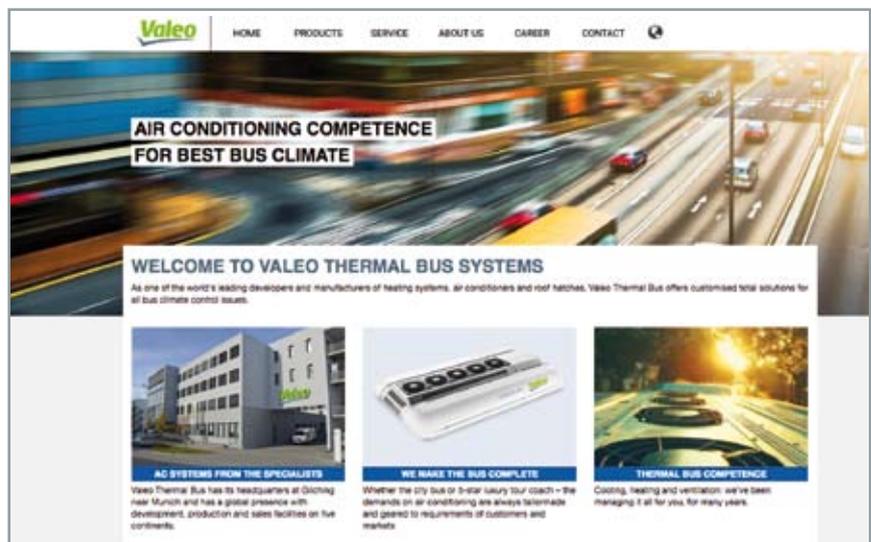
Since its founding in 2006, the former Spheros Group has positioned itself as a technological leader in the bus air conditioning segment. Under the umbrella of Valeo an excellent basis has now been

created for promoting innovations in bus air conditioning. Within the Valeo Group, Valeo Thermal Commercial Vehicles makes an important contribution to achieving the corporate strategy and objectives, as far as the reduction of CO2 emissions – in particular through electromobility – is concerned. The new product group also supports the corporate goals in its expansion into fast-growing markets, and new perspectives are opened up by the takeover. "We now have the strength, the backing, the presence and the technologies of a corporate group that generated sales of 18.6 billion euros in 2017 and has invested 1.9 billion in R&D. In addition, in 2017 Valeo applied for over 2,000 patents," says Mark Sondermann (Executive Manager TBS).

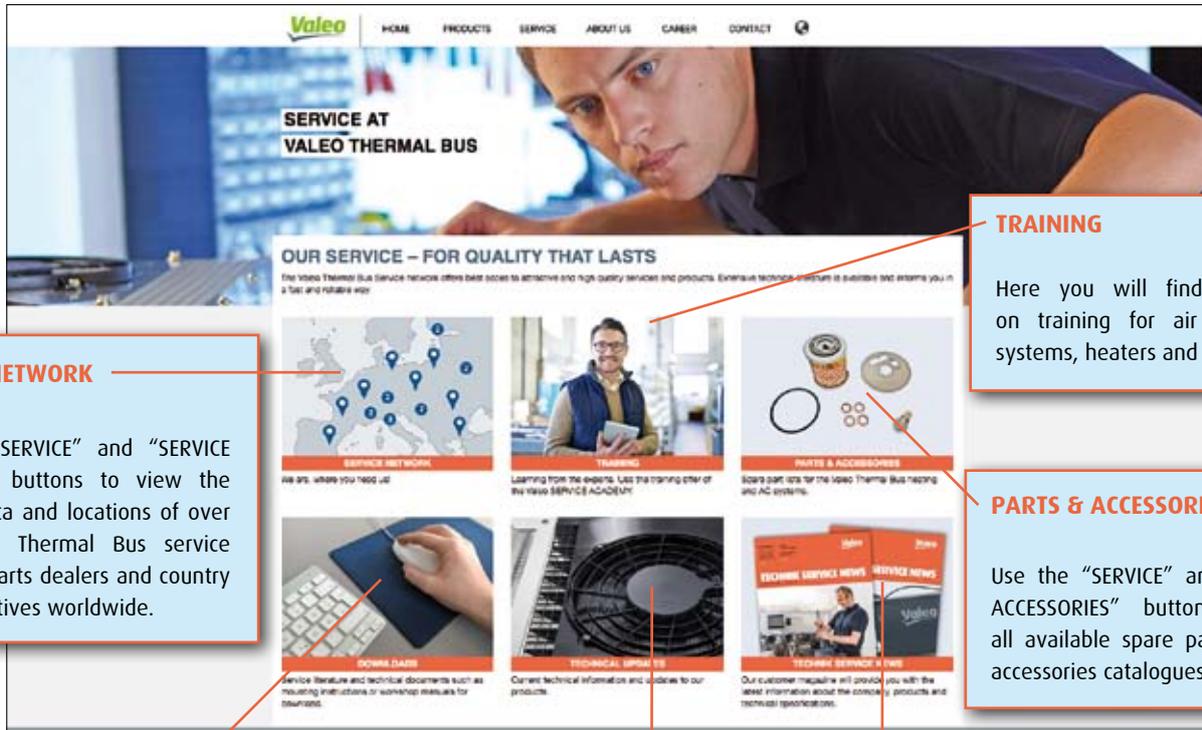
New webpage

The new Valeo Thermal Bus website has been online since mid-October last year. It is more up-to-date, informative and intuitively arranged. All content on products, technologies and services is easy to find via the simple user interface. Navigation and breakdown of content are similar to the previous

website, so that tedious searching is no longer necessary. When the user clicks on the new homepage www.valeo-thermalbus.com one thing will become clear: as part of the Valeo Group, the focus on reliable bus air conditioning products remains an intrinsic component of the company's philosophy.

The new homepage of www.valeo-thermalbus.com

There have also been some innovations in Service. For an overview of the most important changes visit www.valeo-thermalbus.com/eu_de/Service or www.valeo-thermalbus.com/eu_en/Service



SERVICE NETWORK

Use the "SERVICE" and "SERVICE NETWORK" buttons to view the contact data and locations of over 990 Valeo Thermal Bus service partners, parts dealers and country representatives worldwide.

TRAINING

Here you will find information on training for air conditioning systems, heaters and hatches.

PARTS & ACCESSORIES

Use the "SERVICE" and "PARTS & ACCESSORIES" buttons to view all available spare parts lists and accessories catalogues.

DOWNLOADS

Use the "SERVICE" and "DOWNLOADS" buttons to view available service literature (installation and operating instructions, maintenance schedules, workshop manuals, etc.) – subdivided into the areas air conditioning systems, heaters, pumps, control units and hatches.

TECHNICAL UPDATES

Use the "SERVICE" and "TECHNICAL UPDATES" buttons to view technical information (TIS) on air conditioning systems and heaters, as well as the latest software for downloading (e.g. STT).

TECHNIK SERVICE NEWS

All customer magazines of the past few years are available here with the latest company, product and technical information for downloading.

New design for flyers and brochures

Product flyers and brochures will have the same design and appearance as before, always with a focus on the bus. Only the logo and colours have been aligned. Headlines, product names and pictorial language remain unchanged.



NEW VALEO THERMAL BUS SERVICE ACADEMY

In the times of globalization and electromobility, particularly in the bus industry, the demands made on the workshop personnel and employees are ever increasing. Vehicles from all over the world are coming to Europe, the introduction of Euro 6 vehicles is bringing about innovations and the conversion to the new high-voltage technology in electrobuses is presenting completely new challenges to employees.



This is also reflected in the countless new bus heating and air conditioning technologies. There is a growing need to train workshop employees, in particular, on new products and technologies. Valeo Thermal Bus has recognised this need and is endeavouring to cater for the increasing requirements: from 01.06.18 the service team is to be reinforced and courses of international, specialized and expert training are to be provided by a professional training manager who can look back on 20 years of experience in the field of bus heating, ventilation and air conditioning. All particulars of the new training manager, as well as dates, services and offers will be published in the next issue of Technik Service News

at the end of the year. Besides the basic technical training on error source identification and maintenance, service and repair work, the content will also be broken down into basic, expert and professional levels. Specialised air conditioning training will also deal with the heat pump function and its mode of operation.

As a consequence Germany has been divided into three territories, which have now been allocated to Andreas Rösner, Jürgen Hoffmann and Franz Bergmaier as shown in the map below.



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Valeo's Thermo plus achieves unparalleled low emission values, and is thus ideal for use in the electrobus.

Reduced-emission Thermo plus diesel heater

CURRENTLY THE BEST HEATING SOLUTION FOR ELECTROBUSES

In its latest fuel-powered Thermo plus heater Valeo has implemented an improved start-up phase, optimized switching threshold adjustment and optional new drop-stop nozzle. It enables the bus heater to achieve unrivalled low emissions and reduced fuel consumption. In addition to use in diesel buses, this makes it particularly interesting for electrobuses, which due to their limited energy resources at low outside temperatures are reliant on an additional fuel-powered heater.

The pressure exerted on mobility service providers to convert to a local emission-free operation is greater than ever. Supplying electric power to auxiliary equipment such as electric heaters, however, still constitutes a huge challenge: energy resources are limited due to the low energy density of the batteries and the absence of utilizable waste heat from the motor. This calls for a highly efficient reduced-emission heating solution. Thanks to the newly developed features of Valeo's Thermo plus, in an electrobus it emits extremely low exhaust

fumes (HC 0.01 %, CO 0.04 % and NOX 1.8 % of the current EU6 emission limits).

How does the newly developed Thermo plus reduce heater fuel consumption and emissions?

Start-up phase optimization

Optimization during the start-up phase has substantially reduced both the level and duration of emissions. The Thermo plus heater achieves a reduction in hydrocarbons (HC) of up to 60 % and carbon

monoxide (CO) emissions of up to 35 % compared to its predecessors Thermo and Thermo S.

Lower switching thresholds

The lowering of the upper and lower switching thresholds reduces the number of switch-on operations and achieves a 30% reduction in fuel consumption in the course of a heating period. This results in less short combustion times and an increase in medium combustion times.

Use of the drop-stop nozzle (optional)

Use of a drop-stop nozzle in the Thermo plus reduces dripping following fuel injection, and prevents the formation of smoke during the stopping and start-up phase. Exhaust emission values during these operations show a substantial improvement over the standard nozzle.

NEW VERSIONS OF THE MINISPHERE ROOFTOP AIR CONDITIONING UNIT

The Minisphere rooftop air conditioning unit sets a new standard in terms of weight, design, performance and efficiency, and is suitable for all standard minibuses and climatic conditions worldwide. From mid-2018 onwards all versions will be available with optional cooling, heating and/or fresh air function.



With a cooling capacity of 10 and 13 kW while maintaining the same length, the Minisphere modular rooftop air conditioning unit satisfies all requirements for minibuses worldwide. A remarkable weight of

38 kg for the 10 kW version – 22 kg lighter than its predecessor CC145 – makes it the lightest air conditioning solution for minibuses. This was made possible by a consistent lightweight aluminium construction

without compromise with regard to quality, stability and performance. Thanks to its low weight, the unit can be installed quickly and easily, making it particularly suitable for retrofitting. Due to its flat, aerodynamic construction, it is optimally adapted to the vehicle design, and fuel consumption is extremely low. The modular Minisphere is available with a central or lateral air outlet position. An air distributor for the central air intake will be available as an option from the middle of next year.



SC 400/410 control element

The Minisphere is operated and regulated with the specially developed SC 400 control element, which has protection class IP54 at the front and is thus splash-protect-

ed. The SC 400 offers both auto and manual modes. Temperatures can be set between 17 °C and 24 °C in 0.5 °C increments. Blower stages 1 to 3 are switched depending on the temperature difference. Error codes are shown on the display. The SC 410 is operated in all versions with heating and/or fresh air function.

NEW GENERATION OF FANS AND BLOWERS

Since October last year the new generation of axial and dual radial fans with EC motors has made its debut on the market. These comprise the REVO, REVO-E, REVO-Global and Aerosphere World air conditioning units and the E-Cooler BTM battery cooling.



New 305mm axial fan.



New dual radial fan.

Technical features such as air flow volume, power consumption, noise emissions, weight and dimensions remain unchanged compared to

the previous models. Furthermore, the mechanical and electrical interfaces are identical. The new generation of axial and dual radial fans is

thus 100% backwards compatible with the predecessor models.

Valeo axial and dual radial fans

Speed-controlled and with best EC motor technology, the fans guarantee optimised efficiency and

reduced power consumption. The brushless EC fans achieve a service life of more than 30,000 hours.

Valeo - Mat. Nr. old	Valeo - Mat. Nr. new	Blower / Fan	use
11114118C	11122715A	Dual radial blower	Aerosphere World REVO REVO Global
11113528C	11122717B	Axial fan 305mm	Aerosphere World REVO Global
11114716C	11122719A	Axial fan 405mm	REVO REVO-E E-Cooler BTM

NEW GENERATION OF REVO-E WITH HEAT PUMP FUNCTION FOR USE AT TEMPERATURES AS LOW AS -5 °C

Following the successful series introduction of the all-electric REVO-E rooftop air conditioning unit with heat pump function, the second generation will be going into series production in the middle of this year. Its main advantage lies in the broader operating temperature range of the heat pump. In addition, the portfolio will be complemented by a second more powerful 30 kW version.

While the minimum operating temperature of the heat pump was hitherto only +3 °C due to icing of the exterior heat exchanger, the new generation of heat pumps is guaranteed to function at ambient temperatures as low as -5 °C. This is made possible by a reliable virtual icing sensor and fully automatic hot gas defrosting with energy-optimized defrosting time. Besides the previous model with a 25 kW cooling capacity, the range has been complimented by a second more powerful 30 kW version. The unit has been optimized with regard to noise emissions, and in addition to hybrid buses it is particularly suited

to use in electrobuses. The design and technical values of the REVO-E heat pump remain unchanged.

About REVO-E

The all-electric REVO-E rooftop air conditioning unit for hybrid and electrobuses features intelligent energy management, i.e. the cooling capacity is generated according to needs, depending on available energy. The electric compressor is compactly located on the roof and not at the back of the vehicle as with conventionally powered bus air conditioning units. Due to the integration of all components that carry refrigerant, the closed system



is efficient, leak-proof and virtually maintenance-free. In addition, the compressor is supported on

a sophisticated, patented bracket concept, making it silent with minimum vibration.

SPUMP PUMP GENERATION WITH AN ADDITIONAL 500W AS WELL AS NEW PWM AND CAN VARIANTS

After the SPump with on/off control went into series production in 2016, this year the product family has been expanded to include three new versions with an additional 500W pump as well as PWM and CAN control methods. The pump thus offers an ingenious solution for any application, and besides bus heating it can also be used for completely new applications, e. g. cooling electrical components.

The SPump series was developed specifically for vehicles with hybrid, plug-in or electric drive, and offers decisive advantages: even shorter dimensions and an extended ambient temperature range of -40 °C to +95 °C permit a host of installation options. With the full protection package, from run-dry protection to an extensive electronic protection system, the SPump is extremely reliable and resilient, even in extreme traffic and climatic conditions. The new versions with PWM and CAN control permit variable speed control and save energy due to optimum tuning to the overall system. In addition, intelligent feedback with function monitoring is enabled with diagnosis of

the pump. A further 500 W version provides the high performance needed for e-bus applications with a flow rate exceeding 10,000 l/h. Depending on customer requirements, a range of features can be selected for the new PWM and CAN versions: in the case of the SPump 260 PWM the variable speed control is standard, and a diagnosis function is available as an option. The two CAN versions with 260W and 500W are equipped as a standard with variable speed control and diagnosis function. A customized CAN parameter adjustment can also be selected, in which the configuration of a total of 41 parameters is possible.



The new SPump pump generation.

The CAN interface is configured in accordance with SAE J1939. Due to its modular concept in the Valeo

flexible CAN up to nine pumps can be independently controlled in one system.



Depot of Rheinbahn AG in Düsseldorf-Lierenfeld.

THREE METROBUS LINES FOR RHEINBAHN AG IN DÜSSELDORF

Founded in 1896 as the Rheinische Bahngesellschaft AG, the Rheinbahn AG is the public transport undertaking of North-Rhine Westphalia's capital city Düsseldorf. Services are scheduled to start on three Metrobus routes in the second half of 2018. Rheinbahn is proposing to operate Metrobus routes with 1.3 million additional kilometres and 3.7 million more passengers.

From Monday to Saturday the routes will be served with a frequency of 20 minutes. During the week services will start at 6 o'clock

and Saturdays at 8 o'clock. In the evenings the buses on each route will run until 9 o'clock; on Sundays there will be no Metrobus services.

Metrobus will be operated exclusively with the Solaris New Urbino 18 vehicles that were newly acquired in 2018. In the first batch,

Rheinbahn purchased a total of 74 vehicles. Solaris New Urbino 18 articulated buses are equipped with extremely environmentally friendly



Routes of the three new metro lines.



Solaris New Urbino 18 articulated buses are equipped with an extremely environmentally friendly and low-emission Euro VI motor.

and low-emission Euro VI motors, and have a maximum passenger capacity of 154. As far as the air conditioning in the driver's section and passenger space was concerned, a decision was made in favour of three of Valeo's Citysphere modular a/c units.

About Rheinbahn AG

Rheinbahn stands for flexibility and mobility. With its 735 vehicles, it carries about 740,000 passengers every weekday on 111 routes in a catchment area of 570 square kilometres with a population of over a million. In 2016 a total of 223.4 million passengers travelled on Rheinbahn's 135 light-rail vehicles, 175 trams and 425 buses. The overall system has 3,340 stops, and total kilometres driven amount to 48.2 million annually.

About Citysphere

The modular Citysphere a/c unit not only has a unique, patented air circulation system in the passenger compartment; it is also characterized by significantly lower life cycle costs. What makes the Citysphere so special is that in contrast to a full air conditioning system the additional fuel consumption is hardly perceptible. The core piece of the approx. 50 kg lightweight rooftop unit is its hermetically sealed compressor. Besides dispensing with hoses, it contributes to the best-possible leak tightness of the overall system and in turn a reduction in environmental pollution.

The unit is suitable for use in either diesel-operated or electric buses.



Solaris Urbino 18 (predecessor model) with three Citysphere modular air conditioning units.



Buses purchased in 2012, likewise with Solaris Urbino 18 (predecessor model), each with three Citysphere modular a/c units.

NEW TECHNOLOGIES

CONVERSION OF TYPE PLATES FROM SPHEROS TO VALEO

SPHEROS		E1	122 00 0467
Made in Germany			10 05 7559
HEATER MODEL	Thermo plus 300		
VOLTAGE / EL. POWER	24V / 90W		
HEAT FLOW RATE	30kW		
FUEL	Diesel		
MAX. OPERATING PRESSURE	2bar		
			
Part No. 11120613A	VERS.: 002	Serial No. 15055643	
Year of installation	2017 2018 2019		

Valeo		E1	122 00 0467
Made in Germany			10 05 7559
HEATER MODEL	Thermo plus 300		
VOLTAGE / EL. POWER	24V / 90W		
HEAT FLOW RATE	30kW		
FUEL	Diesel		
MAX. OPERATING PRESSURE	2bar		
			
Part No. 11120613A	VERS.: 002	Serial No. 15055643	
Year of installation	2017 2018 2019		

To ensure a high level of safety and environmental compatibility for all road traffic participants, the manufacturers of:

- motor vehicles and
- components for use in motor vehicles

must satisfy regulations and general technical requirements for the type approval of these vehicles and components. Type approval is issued by the authority responsible for road traffic – in Germany this is the Kraftfahrt-Bundesamt (KBA:

Federal Motor Transport Authority). As the owner of type approvals, Valeo Thermal Commercial Vehicles GmbH must also fulfil these obligations. In particular, it must ensure that the KBA is immediately notified of each change in name,

legal form or company headquarters. This duty of due diligence has been exercised and the transfer of Spheros to Valeo was duly notified. Since the end of last year all type plates carry the Valeo logo.

REPLACEMENT OF GAS REGULATORS IN GBW APPLICATIONS

The new Thermo G gas heater has been in series production since the beginning of 2016. An elementary part of the gas heater is the gas regulator that is now significantly more compact, lightweight and can be installed as a replacement in existing GBW applications.

The new compact gas pressure regulator has proven its worth in volume production for Thermo G applications, the latter can now be installed as a replacement regulator for existing GBW applications with natural gas. In the long term only the new gas regulator will be available.

At this point it should be noted that for safety reasons the gas regulator must be replaced after four years of operation.

Overview of gas regulators NGW / GBW

Gas regulator (old)	Gas regulator (new)
9004006B	11121335A
11113411A / 9009636B	11121335A
9006881A	11121334A
9005709A	11121334A
9010283A	11121334A
9009561A	11121334A



Conversion kits and instructions

Because the new regulator is easy to install in existing GBW applications, full conversion kits have

been generated for different high pressure pipe diameters. These are now available:

High pressure pipe diameters	Conversion kits
6 mm	11121895A
8 mm	11121896A
10 mm	11121897A

The above conversion kits contain:

Gas pressure regulator for high pressure pipe / spare parts kit

Depending on version for 6mm (11121909a), 8mm (11121920a) or 10mm (11121921a)

each incl.: 1x Swagelok fitting, stainless steel tube L=500mm, Swagelok double fitting, gasket ring gas pressure regulator

Gas pressure regulator for low pressure pipe / spare parts kit 11121910A

incl.: 1m gas hose 5/8" Thermo G | 1x hose clamp 25-40mm for hose GBW | 1x adapter 1"-5/8" | 2x hose clamps 16-27mm for Thermo G hose

Gas pressure regulator water connection / spare parts kit 11121911A

incl.: 2x hose clamps 16-24mm for GBW water hose | 2x adapters 15mm-8mm | 2m water hose 8 x 3.5mm | 4x hose clamps for 8mm hose

Gas pressure regulator safety valve / spare parts kit 11121912A

incl.: 1x hose connector 16mm | 0.5m water hose DN16 | 2x hose clamps 16-24mm

Gas pressure regulator attachment / spare parts kit 11121913A

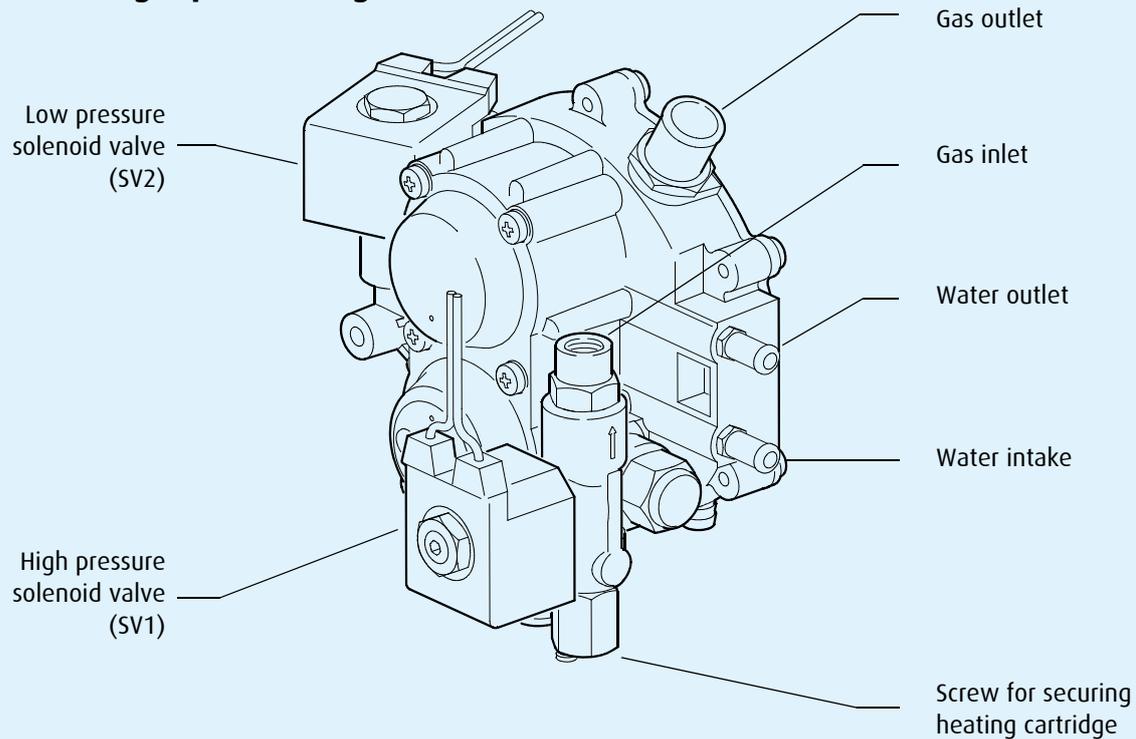
incl.: 1x adapter bracket | 1x hexagonal nut m10 | 1x washer B10 | 1x spring washer a10 | 4x combination nut m6

Detailed conversion instructions for replacing the old with the new gas pressure regulator can be found on our homepage under the following links:

http://www.valeo-thermalbus.com/eu_en/Service/Spare-Parts-Accessories/Heating-systems/GBW-300

http://www.valeo-thermalbus.com/eu_en/Service/Downloads/Heating-systems/GBW-300

Explanation of the gas pressure regulator



The gas is fed in via the vehicle's gas system with integrated gas pressure regulator. The gas pressure regulator controls the supply pressure (max. 220 / min. 5 bar) in three stages to the required working pressure. The required gas volume is released through a dia-

phragm valve in the gas pressure regulator under negative pressure. The gas pressure regulator has two solenoid valves (see Fig. above). Solenoid valve 1 (SV1) releases the gas supply from the tank to the gas pressure regulator (high pressure branch). Solenoid valve 2 (SV2) re-

leases the gas supply from the gas pressure regulator to the heater (low pressure branch). Because the expansion of the compressed gas in the gas pressure regulator results in strong cooling, it must be reheated. This takes place by integration into the cool-

ing water circuit. The gas pressure regulator is connected by T-pieces to the water outlet and water intake on the heater. Heated water is diverted at the water outlet and flows through the gas pressure regulator, from where it returns to the heater via the water intake.

TRADE FAIRS FROM JUNE - DECEMBER 2018

WE LOOK FORWARD TO MEETING YOU

Valeo Thermal Bus Systems is represented at many trade fairs dedicated to automotive progress.

At these fairs you can acquaint yourself with us and our products. We will be pleased to answer any questions on our products and their installation.

Date	Trade Fair	Location
03.06. - 06.06.	TN TAPT	Piegon Forge/USA
12.06. - 13.06.	CTAA	Pittsburgh/USA
25.06. - 28.06.	MI MAPT	Crystal Mountain / USA
20.09. - 27.09.	IAA Nutzfahrzeuge	Hannover/Germany
01.10. - 03.10.	BUSCON	Indianapolis/ USA
23.10. - 25.10.	TRANSEXPO	Kielce/ Poland
23.10. - 25.10.	Busworld Russia	Moscow/Russia
24.10. - 26.10.	International Bus Expo	Rimini/ Italien
08.11. - 10.11.	TRANSIST Istanbul Transportation & Congress Fair	Istanbul/Turkey
25.11. - 29.11.	Tehran Commercial Vehicle Show	Tehran/Iran

New high-voltage technology

DEVELOPMENT AND VALIDATION AT THE VALEO TECHNOLOGY CENTRE GILCHING

In order to satisfy the significantly increased demand for electric bus air conditioning systems with heat pump function, Valeo Thermal Commercial Vehicles has set up a dedicated test stand for the development, validation and release of these systems.

In the heat pump function the cooling circuit is reverse compared to the cooling function; energy is extracted from the environment by the external heat exchanger and used primarily to heat the interior of hybrid and electrobuses. The heat pump achieves a heat output up to three times the power consumption and heats the bus interior extremely efficiently at outside temperatures of $<0\text{ }^{\circ}\text{C}$. In addition, the range of the vehicle is only slightly reduced due to the low power consumption of the HVAC system.

New heat pump test stand with exterior and bus interior simulation

Because air conditioning systems with a heat pump function have two different operational states – cooling and heating – they require considerably more complex test stands than pure a/c systems. The new heat pump test stand has a base area of 50 m^2 and an inside volume of 160 m^3 . The complete test stand is designed as an isolation room, as with system performance measurements it is extremely important to prevent outside energy from being transferred to the test chamber and vice versa.



Mobile bus climate chamber for (double-decker) buses at the Gilching Technology Centre.

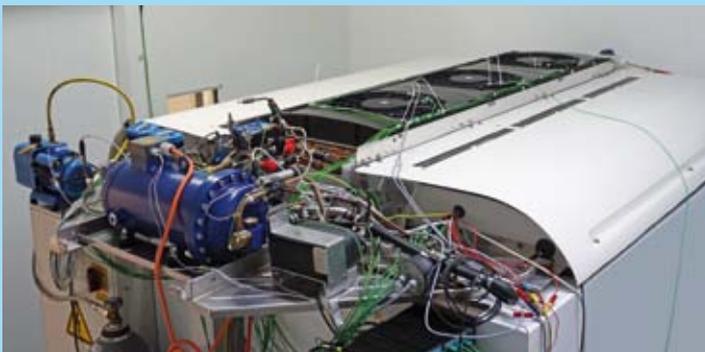
The test stand is subdivided into two segments that are separated from one another by a wall. One chamber simulates the environment, the second the bus interior. When the air conditioning is in operation, the exterior is heated up, e.g. to a temperature of $40\text{ }^{\circ}\text{C}$, and a realistic target inside temperature, e.g. $27\text{ }^{\circ}\text{C}$, is set for the a/c system. In heating or heat pump operation the exterior is, in contrast, cooled to $20\text{ }^{\circ}\text{C}$ and the interior heated up by the system accordingly. Temperature, pressure and humidity

sensors are mounted at all relevant points in the refrigerant circuit and on the airside interfaces of the a/c system to accurately measure the status of the system and its output. The supply of the system for electric vehicles additionally requires a voltage of $600\text{--}900\text{ V DC}$, which is generated by the corresponding converters.

Mobile bus climate chamber for (double-decker) buses

Besides the above-named test stands, a vehicle climate chamber

is also available for tests at the Gilching site, in which the functions of the bus air conditioning system and their control can be checked and optimized. This 18 m long and 6 m high hall can accommodate even articulated and double-decker buses. The interior can be heated to up to $40\text{ }^{\circ}\text{C}$, enabling the cooling rate of a vehicle determined and the interior temperature distribution to be optimized.



New heat pump test stand with outside and bus interior simulation.

