



Spheros wins Best Professional Supplier Award 2015

Managing Director Jürgen Haack receives the award.

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The new aluminium frontbox

for air conditioning the driver's section ensures substantially flexibility and comfort.

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New combustion chambers for Thermo & Thermo S 160, 230, 300, 350, 400 are now available as replacements.

Page 14

Fast-Way: 24-hour parts replacement





Dear Readers,

We can look back on a successful and eventful 2015. In this issue we report on a wide range of interesting themes from the customer environment and current events taking place at Spheros.

In our title story we inform you about the new Fast-Way warehouse, which was built explicitly for the purpose of increasing the availability of spare parts in the aftermarket and improving service.

A further highlight this year was busworld in Kortrijk, the world's biggest bus trade fair, at which Spheros showcased its innovative products especially for hybrid and electrobuses.

We would also like to present a theme on our own behalf. Spheros Europa GmbH won the "Best Professional Supplier Award 2015" in the category "Systems & Solutions". The latter is regarded as one of the most distinguished awards in the supply industry.

Together with the whole after-sales team we have initiated and successfully completed many themes and projects with customers and partners. My sincere thanks go to all who helped to shape the past year and bring it to a successful conclusion.

But we don't want to rest on our laurels: we will start off the New Year 2016 with the same arrangement and the same service-oriented approach.

Wishing you all a peaceful Christmas season and a good start to 2016.

I hope you enjoy reading this latest issue of our Technik Service News!

Carsten Schmidt

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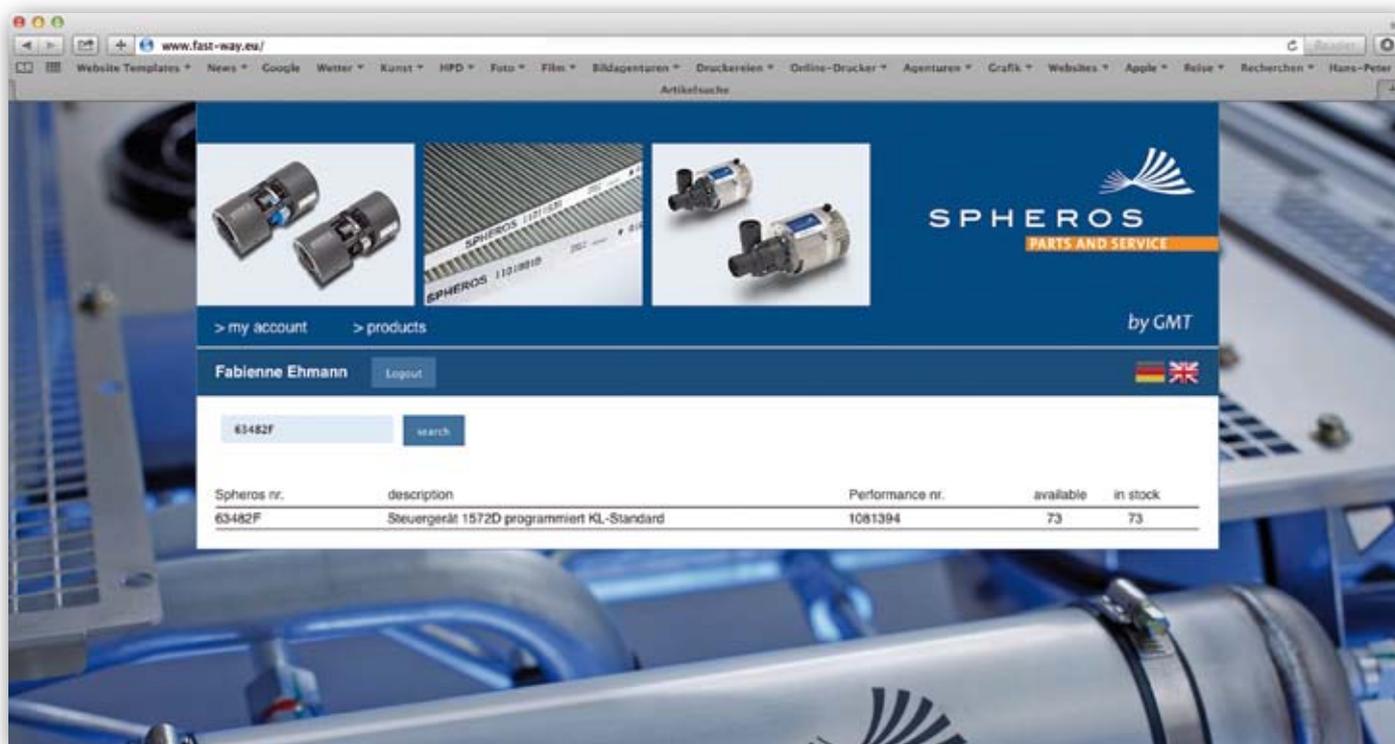
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New Spheros warehouse

Fast-Way: 24-hour parts replacement

Spheros has brought a new warehouse into operation, and at the same time launched an online customer portal (www.fast-way.eu) with an order function for sales partners.



Spheros online customer portal with order function for sales partners (www.fast-way.eu).

Customers of the aftermarket sector usually have spontaneous spare parts needs.

Requirements for the supply of components and assemblies thus differ greatly from those for original equipment. The decisive factors for a high level of customer satisfaction are the availability of parts over the entire spectrum accompanied by a fast response and shipping speed.

With the construction and inauguration of its new Fast-Way warehouse in Neckartailfingen near Stuttgart, Spheros has taken an important step towards optimizing parts availability and meeting customer needs. The total spare parts spectrum of the Spheros product world is covered with a basic stock of over 2,000 different articles. In addition, the Fast-Way warehouse stocks complete assemblies and rooftop air conditioners such as the Citysphere or Aerosphere World. Customers who, for example, have suffered

total loss of an air conditioning unit due to an accident can be provided with a quick replacement.

Online information

Besides the availability of parts, customer sales and service has

also been optimized. On weekdays, stored parts are despatched within 24 hours. The online customer portal www.fast-way.eu enables sales and service partners with individual access data to directly check the stocks for specific

articles and place orders. This means significant time savings and optimized planning for partners and customers.



Spheros Parts & Service: the new after sales warehouse with 24 hour despatch.



Wolfgang Beisler (Managing Director Carl Hanser Verlag), Dr. Robert Schmidt (CFO, Spheros GmbH), Jürgen Haack (Managing Director, Spheros Europa GmbH) and Dr. Wolfram von Fritsch (Chairman, Deutsche Messe AG) at the presentation of the award.

Spheros wins Best Professional Supplier Award 2015

The “Best Professional Supplier Award 2015” in the category “Systems & Solutions” was presented to Spheros at an award ceremony at the Frankfurt premises of Price Waterhouse Cooper, Auditors and Consultants.



This is one of the most prestigious awards in the supplier industry and is presented every two years in the categories “Components & Assemblies”, “Systems & Solutions”, “Technologies, Engineering & Services” and “Best Professional OEM (machine tools)”. In total more than 100 companies competed for the interdisciplinary award, organised by PwC Auditors and Consultants, Deutsche Messe AG and the German Machine Tool Manufacturers Association (VDW) under the patronage of Sigmar Gabriel (Federal Minister for Economics and Energy) and publishing houses Hanser and Henrich Publikationen.

Winner of the “Best Professional Supplier Award 2015” in the cat-

egory “Systems & Solutions” was Spheros Europa GmbH from Gilching. As a development and system partner for climate management in buses, the company develops and produces engine-independent heating systems, water pumps, air conditioners and roof hatches. Spheros convinced the jury with outstanding economic development, proximity to the customer and service orientation on all five continents. But the potential has by no means been fully exploited. Plans call for further horizontal integration in the field of electronics and climate control. In addition, growth potential can be recognised outside the bus industry, for instance in the refrigerated vehicle market in the Middle East.

“For us this award is clear confirmation that the orientation of the company since its founding ten years ago has been right on course,” says Jürgen Haack, Director of Spheros Europe GmbH. “I consider this award to be a

positive reflection of the performance of every one of our employees. At the same time it should be an incentive for us to make every effort to maintain this strong competitive position in future.”

The winners are permitted to display the logo “Best Professional

Supplier” in their company presentation and showcase themselves at the upcoming Industrial Supply trade fair, the leading international trade fair for innovative supplier solutions and lightweight construction at the HANNOVER MESSE from 25 to 29 April 2016.



Jürgen Haack (Managing Director, Spheros Europa GmbH) proudly receives the Best Professional Supplier Award in the category “Systems & Solutions”.

Spheros at the busworld in Kortrijk 2015

From 16 to 21 October, the largest and most important bus exhibition in the world opened its doors. The final figures speak for themselves: around 35,000 trade visitors attended the busworld in Kortrijk and over 400 exhibitors from 36 different countries presented their latest products and concepts.

For the most part, Spheros focused its 150 sq m booth in Rambla North on innovative HVAC solutions, that contribute to making the best use of existing energy resources, thus significantly increasing the range of hybrid and electrobuses – in line with our motto “Entelligence makes the distance”. All this is made possible thanks to innovative air conditioning components, new software that constantly and intelligently controls the most efficient HVAC components as and when needed, and the operating and control concept “Spheros Body Interface”.

Customers, business partners, press representatives and many other visitors showed a great deal of interest in the “Spheros Entelligence” air conditioning system, which was clearly portrayed in a film shown at the booth. This made it easy to understand when, for example, a heat pump is required and how efficiently it is operated, or when an electrical heater should be used. Moreover, all components were also exhibited in the form of hardware, some for the first time, such as the “REVO-E Global”, a new aluminium frontbox, the new-generation “Eleon” roof hatch, as well as the first standalone battery cooling system “E-Cooler”.

The topic of electrification was more prominent than ever for Spheros at this year’s busworld: as of next year, municipalities will begin to buy their first electric vehicles. As the only manufacturer to offer the entire HVAC range (including control electronics), Spheros was in high demand when it came to air conditioning systems for electric buses.

In its second year, the Spheros booth party was also well-received. Customers and partners aplenty were happy to join us in toasting a successful exhibition.



The Spheros trade fair team 2015.

The Spheros exhibition booth and its motto “Entelligence in Bus Climate”

“E” for energy, electronics, and, last but by no means least, electromobility is becoming a key symbol when it comes to drive concepts of the future.

At previous exhibitions, Spheros had already presented topics such as “control” and “load-synchronous

thermal management” besides often addressing the increasing significance of intelligent control systems. At this year’s busworld, we therefore decided it was time to join the dots: the ever important “E” and the concept of intelligence became “Entelligence”. This fusion of ideas was a clear thread running through our booth: not only was a film presented that illustrated the

topic, the physical components were put on display just next to it. Our motto was further reflected in the design of the booth: Alongside Spheros’ corporate colour blue, green also played an important role not only in the wall imagery but also in the form of a lush island of plants and an apple tree.



Spheros presented itself at busworld 2015 on over 150m² of exhibition space.

New Spheros subsidiary in Italy

Central hub for southern Europe

Spheros has expanded its regional presence in southern Europe by opening a new subsidiary in Bologna/Italy. With immediate effect, the company will provide support to customers in Italy, Spain and Portugal, as well as the Maghreb states Algeria, Tunisia and Morocco, from this base.

As part of Spheros' restructuring and realignment programme, Italy will be its new hub in southern Europe. In addition to the major international bus builders, reliable and flexible support can now be offered to manufacturers with smaller production runs. Further focal points of the new company will be the comprehensive service and parts supply, as well as the support of local bus fleets. In this context, Spheros proposes to extend its service network to include proven new partners, thus guaranteeing the supply of Spheros parts for buses. The emphasis will be on thermal products and air conditioning systems. "Our comprehensive sales and service network is much valued by customers," says Jürgen Haack, Managing Director of Spheros Europe. "The founding of Spheros Italy will bring us even closer to our customers in southern Europe and we are pleased to offer them a flexible and comprehensive range of services."

The Italian subsidiary will be managed by Renzo Roli. With long-term experience in the international bus



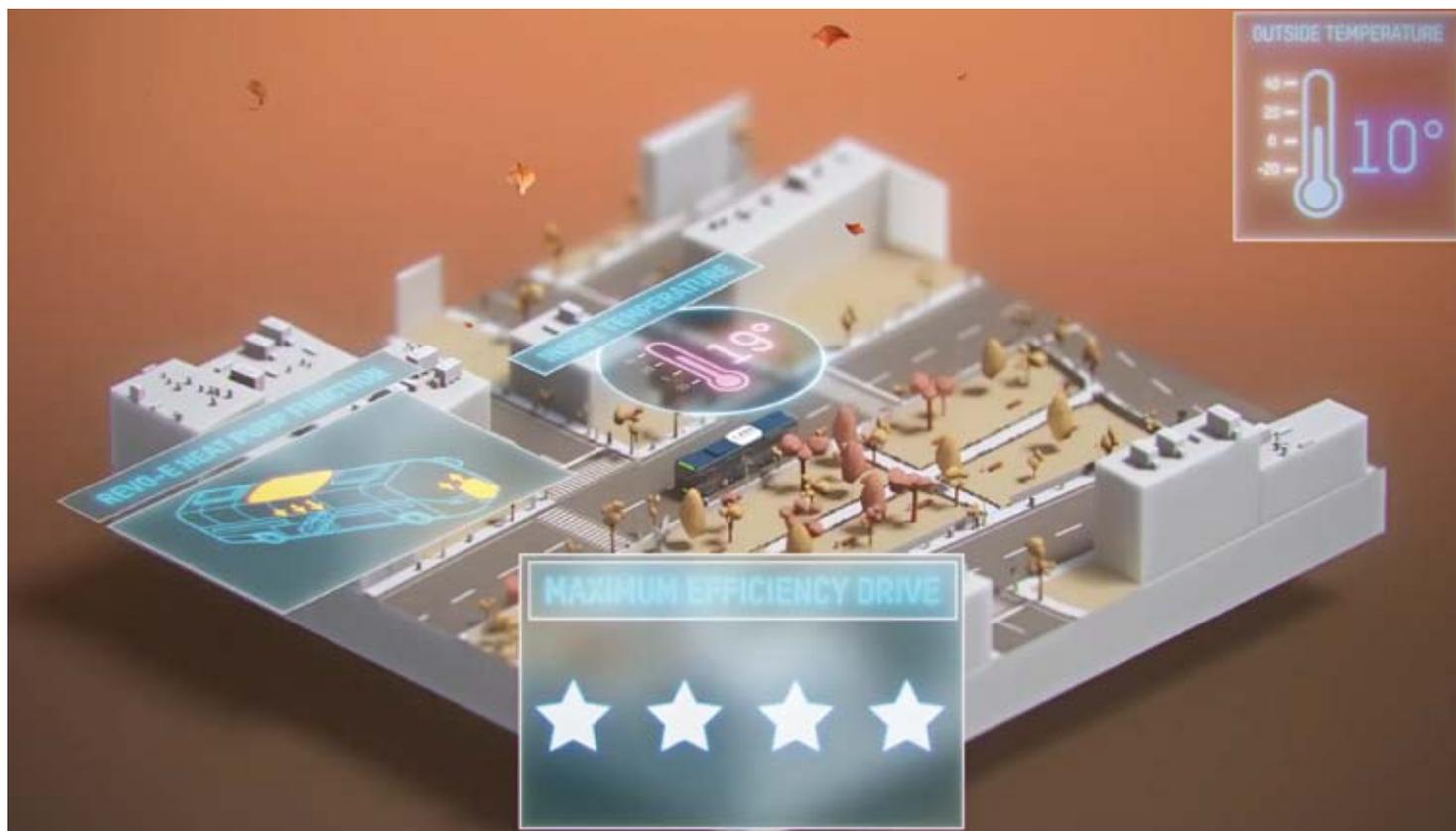
The Spheros Italy team (from left to right): Marco Nicolini, Renzo Roli, Manuela Roli, Rainer Kolodzie, William Breviglieri.

segment and profound product knowledge, he is well-qualified for his duties. Roli will have the technical and commercial support of a local 3-man team.

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Tel. +49 8105 7721 930



Renzo Roli and his 3-member team in the new office buildings of Spheros Italy.



A bus journey to an imaginary city through various different seasons demonstrates the complex subject of air conditioning in the electrobus.

A film about the Spheros Entelligence

Specially for the busworld in Kortrijk we have created a film, which shows how an intelligent Software together with the air conditioning components of Spheros ensure best climate conditions in electric buses, and at the same time saves the energy resources – true to the motto ‘Entelligence makes the distance’.

The film features fine pictures and attractive illustrations cleverly explain the complex concept of “air conditioning solutions for E-buses in public transport”.

It's early morning in winter, a bus is still standing at the overnight depot and its systems are preparing for operation. The different conditions inside and outside

the bus are displayed in an easily understandable data graphic with the aid of a “head-up” presentation.

Now the journey begins, the bus leaves the depot and travels through a city at various times of the day, accompanied by changing seasons. The head-ups provide information on the varying con-

ditions, for example, outside temperature, the charge status of the batteries, which climate component is currently active and at what COP it is being operated. It becomes clear that the demands on electromobility and in particular on the HVAC solutions likewise change according to the various ambient conditions. We quickly recognise that driving on a winter morning

places quite different demands on the energy flow in an E-bus than an afternoon journey in autumn.

The film in full-length on YouTube:

<https://www.youtube.com/watch?v=N5O8sULPagA>



The bus is preconditioned to 22°C Grad at the depot, so that this energy is not needed for the following journey.



The data graphic always displays which air conditioning components are active and at what COP they are operating.



All-electric REVO-E rooftop air conditioner with heat pump and Citysphere S form a single unit on the hybrid bus.

Extensively tried and tested

How can the energy balance in the hybrid bus be improved, while also conserving resources and increasing range? These questions are answered by the Spheros Entelligence concept – not only in theory, but also in two ongoing pilot projects: in cooperation with E-bus manufacturer Bozankaya and the Dresdner Verkehrsbetriebe (Dresden Transport).

In both cases, a special all electrically powered air conditioning system was implemented, which operates according to the heat pump principle. The idea is to use the system primarily for heating by extracting energy from the ambient air in the transitional periods of spring and autumn, as well as in winter. This enables the passenger compartment to be effectively air conditioned at moderate out-

side temperatures, thereby saving energy. A booster heater is then only necessary at extremely low temperatures. In summer, the reverse effect applies for interior cooling. Efficient actuation of air conditioning components and the use of the heat pump save electricity. The diesel motor does not have to be started as frequently to recharge the battery, which in turn reduces CO₂ emissions. For

validation trials, the vehicle was equipped with numerous sensors, which helped record all the necessary data such as temperature, pressure, flow, voltage and brightness. On the basis of the acquired data, the most efficient climate control strategy can be determined in advance for the respective application.

The expectations of our experts have not only been confirmed by

the first measurement results, they have been exceeded.

Validation runs have proven the functionality of the system and underscored the enormous potential of Spheros Entelligence.



In the name of research: the "Pilotlinie 64" project run by Dresdner Verkehrsbetriebe features Spheros Entelligence.



Sileo E-bus from Bozankaya.

Optimum climate comfort for the Scania Citywide DD

Many years of cooperation with colleagues at Scania OmniExpress (former Lahden) produced an air conditioning application at the beginning of 2015 which posed a number of challenges. The objective was to equip a prototype with an air conditioning system in preparation for a tender for approx. 600 double-decker buses for Berlin Transport (BVG).

The Scania Citywide DD used for this project had a total length of only 10.5 metres. A further feature was that this vehicle had only one staircase in the front section. Installation of the rear system, as known from most double-decker applications, was not feasible here. The challenge was to provide both levels of this short vehicle with an adequate supply of clean air at a comfortable temperature with a Spheros split air conditioning system.

The basis of this split system concept is roof boxes, incorporating a condenser, heat exchanger and fresh air flap as well as two dual radial fans. The cooling or heating output is approx. 30 kW. Three roof boxes are installed in the ceiling between the lower and upper deck of the Citywide DD. The air ducts were designed for the inflow of air to the lower deck below the window and for the lower deck from above. This achieves an excellent mixture of air. A slight overpressure during the operation of the system ensures that an exchange of air occurs at bus stops through the open doors, particularly to the upper deck via the staircase.

A further challenge was the placement of the condenser at the rear of the vehicle. Here a solution was found which optimally unifies design and functionality.

This application was rounded off by a compressor that reliably performs its task in the rear of the bus. This bus went into operation in early 2015, and since then the feedback from passengers, bus drivers, service partners and not least the BVG itself as customer has been consistently positive.

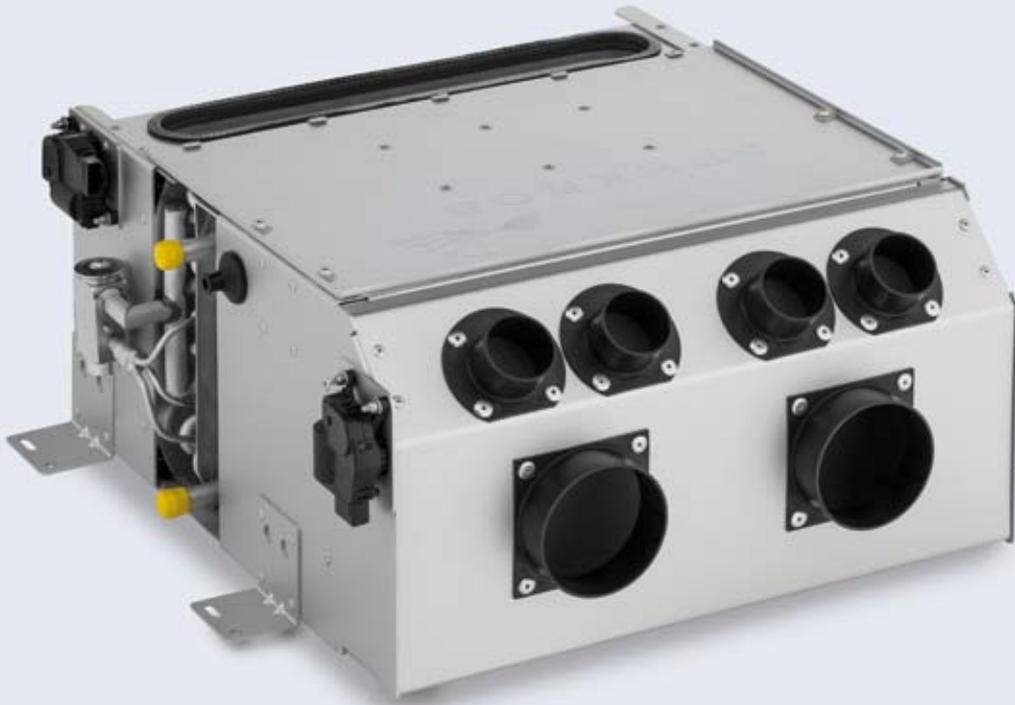
Which bus manufacturer will receive the contract to build approx. 600 buses is to be decided in early 2016.



The Scania Citywide DD was used as a prototype for a Spheros air conditioner application at the beginning of 2015.



Placement of the condenser at the rear of the vehicle presented a challenge.



The horizontal version of the new Spheros aluminium frontbox.

Aluminium frontbox Cool at the wheel

Due to its modular concept, variable connections and application options, the new Spheros aluminium frontbox for climate control in the driver's compartment guarantees significantly more flexibility and comfort.

Any bus driver who sits at the wheel for long hours will welcome pleasant temperatures and a high degree of safety at his workplace at the front of the bus, with an uninterrupted view of the road and traffic. You may think that this is as easy as you with your own car. But the air conditioning, heating or defrosting of the far larger bus windshield cannot be compared with

the more modest requirements of a car. Significantly greater air masses must be moved in the bus, and for safety reasons no compromises can be tolerated when it comes to heating and air conditioning. The blowers of the new Spheros aluminium frontbox generate an unimpeded air circulation of up to 1,100 m³ (free blowing) per hour.

Compared to older models which were usually made of steel, the new aluminium frontbox is a true lightweight (12 kg). With a housing and heat exchanger made of 100% of aluminium we achieve not only significant advantages in terms of weight, but also with respect to corrosion protection. Its modular design and variable connection options provide maximum flexibility.

Depending on the requirements of the bus manufacturer, the unit can be mounted either vertically or horizontally, in the centre of the dashboard, below the floor or below/behind the driver's seat. In addition, the air manifold can be adapted to the specific vehicle type.



Flexible and comfortable: the new Spheros aluminium frontbox for air conditioning in the driver's section.



Here: the vertical version of the new aluminium frontbox.

Spheros E-Cooler

Optimum working conditions for the battery

Systematic cooling is essential to prevent overheating of the high-performance batteries of hybrid and electric buses. For this purpose Spheros developed the E-Cooler with integral control for energy-optimised operation.

Battery performance is crucial to electromobility: like the passengers, they also need a feel-good atmosphere. To ensure optimum exploitation of their capacity both during and prior to operation, they must be maintained within a narrow temperature window. This is where the Spheros E-Cooler comes in: with a maximum cooling capacity of 5 kW it ensures effective removal of the heat produced during charging and discharging. If necessary, the battery can also be protected from cold: a heating function can also be integrated via the E-Cooler.

The Spheros engineers placed a special emphasis on low-energy

operation. The electrically powered compressor is not actuated at low outside temperatures and the system switches automatically to passive cooling (only water cooling). The PWM control of the compressor and blower is actuated as necessary. In addition, there is a CAN-bus connection to the vehicle.

Independent and flexible

The E-Cooler is a standalone solution that functions without additional equipment. Located in immediate proximity to the battery, it is an integral part of the overall battery concept. The individual components can be aligned according to the vehicle geometry and



Spheros E-Cooler: The battery cooling with integral control for energy-optimised operation.

thus adapted to the requirements of the respective bus manufacturer.

Added travel comfort for BOGESTRA buses

Bochum-Gelsenkirchener Straßenbahnen AG (BOGESTRA) is increasing its fleet size by fourteen new Solaris Urbino 18 type articulated buses. At the request of the transport undertaking they will be equipped with the Spheros Citysphere in the "Comfort" version.

In its tenders in 2013 and 2014 BOGESTRA, with head office in Bochum, had already selected the Spheros Citysphere for installation in the Evobus Citaro C2 and MAN A23/A37 vehicle types. Now the new Solaris vehicle fleet is to be equipped with the Citysphere air conditioner: for the first time in

the Comfort version for air conditioning of the passenger compartment and the Citysphere S for the driver's section.

The advantage of this system concept lies in the autonomous control of three "climate zones" in the vehicle: the driver's section can be air-conditioned separately



A Comfort version of the Citysphere is installed in the passenger compartment and a Citysphere S in the driver's section.



The new Solaris fleet of BOGESTRA was equipped with the Spheros Citysphere.

from the passenger compartment in both the front and rear parts of the vehicle. In addition, during the cooler seasons the Citysphere Comfort introduces warm air to the interior of the vehicle by means of a special air circulation system. The decision in favour of this air conditioning version was justified

by the reduction of follow-up and maintenance costs, as the system has a maintenance-free refrigerant circuit.

Also included in the delivery are a Thermo S with a heat output of 35 kW, an auxiliary heater and a 6000SC water circulation pump.

Successful retrofit: Leipzig and environs benefit from the Citysphere modular a/c unit

Since the beginning of 2015, 32 Setra buses of municipal transport authority Regionalbus Leipzig have been operating in Leipzig, retrofitted with the compact Citysphere air conditioner. For Spheros this was by no means the first contract for the regional transport authority undertaking: numerous products such as the Easysphere air conditioner in the driver's section and Aerosphere rooftop unit have already been in use for many years.



At the beginning of the year 32 Setra buses were retrofitted with the Spheros Citysphere modular air conditioning system.

Regionalbus Leipzig employs a workforce of approx. 260 at its four locations in Colditz, Deuben, Grimma and Zwenkau in the District of Leipzig (Saxony). Management and administration are located in Deuben. The transport operator mainly serves the City and District of Leipzig, the districts of Central and Northern Saxony and peripheral areas of Saxony-Anhalt. Its fleet comprises 129 vehicles of bus types Setra, Mercedes-Benz Citaro and various minibuses.

further in the quality of service. With an eye to the environment and operating costs, the company opted for the modular Citysphere air conditioning unit with its patented air circulation system. In addition to the buses retrofitted with Citysphere, in 2015 the transport operator also purchased 15 new Mercedes-Benz Citaro with the Spheros REVO rooftop air conditioning system.

In addition, all the transport operator's buses are fitted with Thermo 300/350 heaters, Aquavent 6000SC circulating pumps and Bus Top Premium roof hatches from Spheros.

Added comfort for Leipzig

At the beginning of the year Regionalbus Leipzig decided to invest

Maintenance schedules for the Thermo and Thermo S

At the start of the heating period we would like to draw your attention to the necessity for preventive maintenance work on heaters.

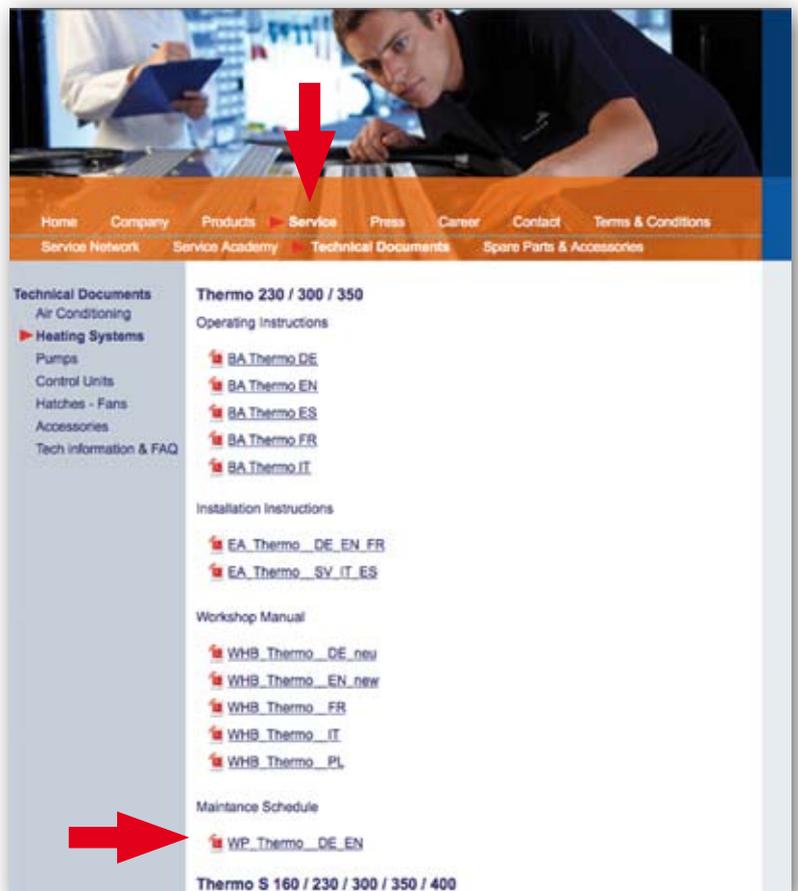
Like all parts of a vehicle, the heater is exposed to constant stress. Regular maintenance work must be carried out by trained personnel at prescribed intervals in order to ensure smooth bus operation and avoid damage to parts.

The correct treatment of heaters with evidence that the prescribed service work has been carried out is a prerequisite for the recognition of possible warranty claims in the event of damage to parts subject to maintenance.

The Spheros workshop manuals contain up-to-date maintenance schedules (Annex A).

In addition, these schedules are available for downloading and printing out at www.spheros.de under "SERVICE / Technical Documents".

<http://www.spheros.de/Service/Technical Documents/Heating systems.html>



Current maintenance schedules can be downloaded from the "Service" segment of the Spheros website.

Spheros Thermo Test (STT)

– Diagnosis with new V1.3 software

Regular new and refined technological developments of heater models necessitate adjustments to the required maintenance and repair tools. The software (new Version V1.3) of the STT diagnosis has been extended to include the new Thermo G gas heater. The diagnostic tool is now suitable for the Thermo, Thermo S and GBW models, as well as the completely new Thermo G heater. No connection is available for the Thermo E series.

Component parts of the STT Diagnosis (11112449C) are:

- STT diagnosis adapter complete
- STT PC diagnosis SW user CD-ROM
- USB cable
- STT Diagnosis operating manual
- Adapter wiring harness for diagnosis NEW – Thermo; GBW; Thermo plus (2710933C)
- Test plug (11117924A) for Thermo S heaters from 12/2012

The current operating manual and latest V1.3. software are to be found under the following link on the Spheros homepage:

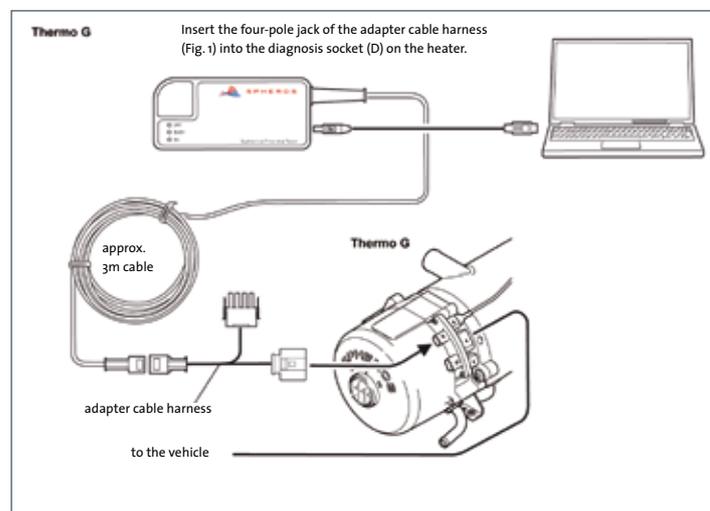
<http://www.spheros.eu/Service/Spare-Parts-and-Accessories/Accessories.html>

To guarantee reliable diagnosis of Spheros heaters and continued high-quality technical support, we strongly recommend the use of SpherosThermoTest diagnosis for Spheros heaters. Alternatively, diagnostic systems of the vehicle manufacturer which incorporate STT software can

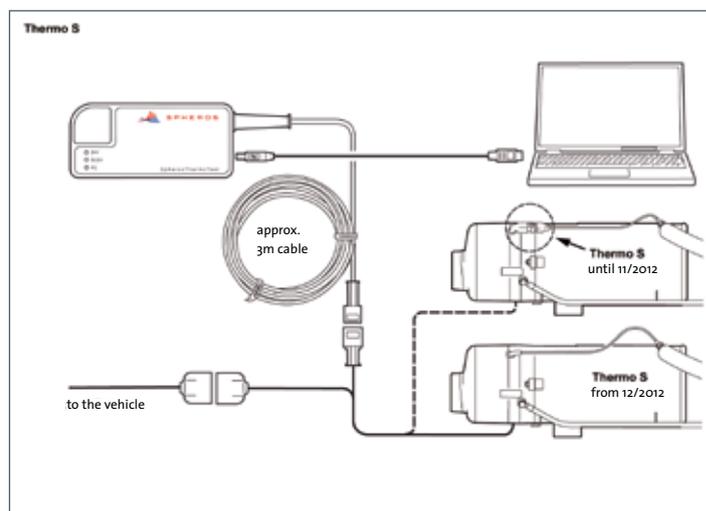


The Spheros Thermo test diagnosis with its component parts.

be used. Only then can Spheros provide support in the event of unexpected complications or questions.



Connection to the Thermo G heater.



Connection to the Thermo S heater.

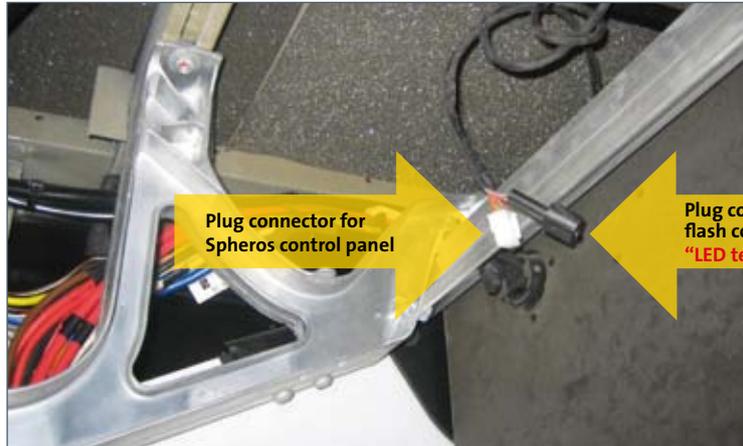
Citysphere in workshop mode:

How the test stand was put into operation

Citysphere air conditioning units in city buses are equipped with an automatic outside temperature-dependent output control (compressor and fan speed) and thus satisfy all performance specifications recommended by the Association of German Transport Undertakings (VDV).



Control panel
for forced control and diagnosis:
2710688 B



Citysphere air conditioning units in city buses are equipped with an automatic outside temperature-dependent output control (compressor and fan speed) and thus satisfy all performance specifications recommended by the Association of German Transport Undertakings (VDV). The temperature inside the bus is programmed to be 3°C below the outside temperature. However, the air conditioning system is not activated until an outside temperature of >17°C and an interior temperature of >22°C is reached.

In order to force-operate the air conditioning systems in the workshop for the purpose of maintenance work or trials at low temperatures, the standard control panel must be used. To do this, set the operating panel to workshop mode and proceed as follows:

Vehicle engine must be running, generator is functioning!

1. Press the ON/OFF button and hold until -- appears in the display.
2. Now use the arrow key to set 1.

3. Set the second digit to 4 with the fan button. The Password 14 will now appear.
4. Confirm the display 14 by pressing the ON/OFF button.
5. Use the arrow key to set the display to 02.
6. Now confirm again with the ON/OFF button.
7. A flashing 85 will be displayed. This means that the system is operating at max. 85% output (compressor and fan)
8. At the end of the test run return to standard operation (basic

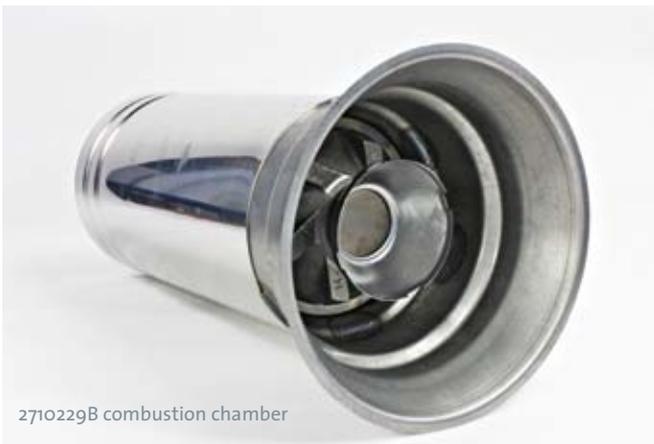
menu) by repeatedly pressing the fan button.

In the event of a malfunction, the error (e.g. undervoltage) will be shown in the display (F3). The error display will clear automatically once the error has been eliminated. There is no need to delete the display!

Because not all vehicle manufacturers use the original control panel (ID No. 2710688 B), for test purposes this must be connected to the plug-in connection in the vehicle.

New combustion chambers for Thermo & Thermo S 160, 230, 300, 350 and 400

In future the following combustion chambers will be available as replacements for the Thermo and Thermo S generations of heaters of performance classes 160/230/300/350/400 kW.



2710229B combustion chamber

	Combustion chamber OLD	Combustion chamber NEW
Thermo 230	44325A	1114186B
Thermo 300	44325A	1114186B
Thermo 350	44325A	2710229B
Thermo S 160	1114186A	1114186B
Thermo S 230	1114186A	1114186B
Thermo S 300	2710229A	1114186B
Thermo S 350	2710229A	2710229B
Thermo S 400	1111476A	1111476A

Spheros maintenance kits: heater servicing made easy

To make service, repair and maintenance activities on Spheros heaters even simpler and more efficient, we have developed the original Spheros maintenance kits for heaters.

The most important aspect of proper operation of the heater is safety in buses. This can only be guaranteed by the use of original Spheros parts.

Original means:

- Highest standards of quality
- Reliability and long life
- Precise coordination of components according to the manufacturer's specifications

Depending on the age of the heater, various service and maintenance tasks may be due. These must be carried out in accordance with the maintenance schedule for Spheros heaters. This should be performed at regular intervals prior to the start of the heating season. The Spheros "small" maintenance kit is ideal for the purpose. These packages are available in standard performance classes for the Thermo and Thermo S models.



Component parts of the "small" maintenance kit.

Current order numbers:

Spheros "small" maintenance kit	for Thermo 230:	11121387A
Spheros "small" maintenance kit	for Thermo 300:	11121389A
Spheros "small" maintenance kit	for Thermo 350:	11121392A
Spheros "small" maintenance kit	for Thermo S 300:	11121394A
Spheros "small" maintenance kit	for Thermo S 350:	11121396A

Older heating units (>5 years) must undergo a more comprehensive inspection. The Spheros "large" maintenance kit, which also in-

cludes the necessary replacement of the fuel pump, was specially conceived for this purpose.

Current order numbers:

Spheros "large" maintenance kit	for Thermo 230:	11121388A
Spheros "large" maintenance kit	for Thermo 300:	11121391A
Spheros "large" maintenance kit	for Thermo 350:	11121393A
Spheros "large" maintenance kit	for Thermo S 300:	11121395A
Spheros "large" maintenance kit	for Thermo S 350:	11121397A

Service and maintenance activities are simpler and more efficient with these kits specially designed for heater maintenance.

Your advantages:

1. Assurance that all required maintenance parts are included in one box

2. No time wasted with repackaging
3. All maintenance parts are certified to Spheros quality standards
4. Attractive pricing

Ask your Spheros sales partner about the original Spheros maintenance kits. It's worth it!



Component parts of the "large" maintenance kit.

Today's theme: Testing air conditioning units

Air Conditioning

Heating Systems

Pumps

Hatches / Fans

Bus Body Electronics

Service

System Components



Prototype workshop at the Gilching facility.

Material testing under extreme conditions

Besides the heater trials at the Neubrandenburg plant, Spheros maintains a further test facility in the new building complex at the Gilching site. The latter focuses on air conditioning tests, including their efficiency in the bus.

Performance test stands for air conditioning systems

The centrepieces are two test stands on which the performance and limitations at various temperatures are determined. The test stand includes a reproduction of the refrigerant circuit, exactly as installed in the vehicle, to obtain the most realistic measurement conditions possible. The cooling capacity of the appliances is then measured at various room and outside temperatures.

Vehicle hall

The focus of trials in Gilching is the efficiency of Spheros products, including control capability in the vehicle. A 400m² vehicle hall in which the bus systems are checked and tested is available at the new site. In addition, a mobile bus climate testing laboratory offering adequate resources for testing diverse vehicle types – even double-decker and articulated buses up to 20 metres in length – is to be put into operation in 2016.

Prototype construction

A prototype workshop is available for trials, guaranteeing a lean and rapid development process. Functional models are built here at an early development stage, or customized system variants derived from series products.

In addition to the climatic testing facilities, Spheros has a development test stand for circulating pumps, a climate chamber for heating capacity measurements of air conditioning units to -20°C,

a rainfall simulator for bus air conditioning and a life-time test stand for air conditioning compressors.



Circulation pump test stand



Heating capacity test stand



Vehicle trials