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a Valeo brand

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Dear Readers,

The first issue of Technik Service News comes to you in a year marked by change. Since our takeover by Valeo we have experienced a number of personnel-related changes and accruals. As the new Head of After-Sales I would like to start by extending a warm greeting to you. I look forward to working together and engaging in an ongoing exchange.

This year there will also be a change in our corporate image. Based on the guidelines of the Valeo Group, we have placed special emphasis on the design of a Valeo bus world. It is aimed at building confidence that we will continue to be a reliable partner to the bus industry in the future. At the busworld trade fair in Kortrijk we will be appearing for the first time under the name of Valeo with the corresponding corporate design, at the usual place at Stand R25, Rambla Nord.

There have been several series additions this year: Beside Minisphere, our new rooftop air conditioning unit for minibuses, our new diesel heater Thermo plus is going into series production as the hybrid heater Thermo H.

In an interview with private transport operator Salza Tours we discuss the company's experience in the use of electrobuses.

Finally, we want to stress the significance of heater type labels, a particularly important subject against the background of our burner replacement concept.

We are already looking forward to a constructive dialogue at busworld Kortrijk in October and hope you enjoy reading the current issue of Technik Service News!

Frank Färber

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LEGAL NOTICE / CONTACT

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Spheros Thermo plus, successor to the current Thermo and Thermo S heaters.

Thermo plus: To make a good heater short

With the Thermo plus Spheros has developed a successor for the current Thermo and Thermo S heaters. The first OEM applications were available at the beginning of the year.

Advantages compared to Thermo and Thermo S

The newly developed Thermo plus heater is available in the three performance classes 23kW, 30kW and 35kW. The Thermo plus differs significantly from its two predecessors in the significantly shorter length (70mm less than Thermo, 60mm less than Thermo S). The advantage of this is that the heater takes up less space in vehicles, and the shorter length is also reflected in the reduced weight (3 kg less than Thermo, 2 kg less than Thermo S). That makes for a lighter vehicle overall and reduces fuel costs.

A brushless EC motor also ensures a longer service life of the heater. In addition, the starting noise and exhaust emissions have been significantly reduced.

Identical interfaces

The interfaces for air inlet, exhaust discharge, mounting points of the heat exchanger, coolant and fuel connection are identical to previous models.

Changes compared to Thermo and Thermo S

Mechanical modifications relate to the position of the fuel connection (Thermo approx. 90°, Thermo S 152° and Thermo plus 100°) and the position of the air inlet due to the smaller dimensions of the burner. The Thermo plus has an external electrical interface to the control device. The power supply to heater and pump is completely separate.

The Thermo plus has an external electrical interface to the controller.

Mark Sondermann takes over as sole CEO of the Spheros Group

In January Mark Sondermann, 53, took up the position of CEO of Spheros GmbH. He is now responsible for the entire Thermal Bus Systems product group, representing the new Bus Division within the Valeo Group. Sondermann is thus the sole successor to Helmut Zanker, who left the company at the end of January after 16 years of service.

Mark Sondermann has assumed the position of CEO at Spheros GmbH.

Sondermann has been an employee of the Valeo Group for 19 years and was most recently Director of Development and Product Marketing for the Business Group Thermal Systems (THS). Increasing customer satisfaction with optimum service and the optimization of the technical product differentiation to the competition are among his goals in his new capacity. "I am proud to have become part of Spheros and look forward to continuing the successful growth and business model in the Bus Division. The technical know-how at Spheros in conjunction with the expertise of our Thermal Systems team will enable the product group to further increase its market leadership in the field of air conditioning systems and conquer new markets," the new CEO emphasises.

After qualifying as a motor mechanic and completing his studies as a mechanical and industrial engineer, Sondermann worked as an engineer in the field of exhaust gas turbochargers and exhaust systems. Since 1998 he has worked in Valeo's Thermal Systems Business Group in various functions in Sales, Project Management and Development.

Frank Färber appointed After-Sales Manager

Following the appointment of Carsten Schmidt as Director Sales of Spheros Europa GmbH in October last year, the company was able to recruit Frank Färber in the role of Head of After-Sales with effect from 01.03.2017. In his new capacity he is responsible for the Europe-wide expansion of the sales organisation structure with a focus on service and spare parts management.

Färber has been a company employee since 2014 and in the past few years he has been responsible as Regional Sales Manager for the BeNeLux and UK markets.
Prior to joining Spheros, Färber held the position of Customer Project Manager at Webasto Thermo & Comfort SE for international customers in the Heavy Duty division and was previously responsible as Product Manager for climate products.

As far as his new scope of duties is concerned, Färber is well aware that satisfied customers are the priority goal of an After Sales organization. The sale of a product should not be the end, but the start of sound and long-lasting customer relations. The prerequisites are: recognition of customer needs, qualified advice and a well-functioning logistics. "In the foreground of my duties will be the continuous expansion of an area-wide service organisation throughout Europe in cooperation with selected, qualified and certified partners. I see an additional challenge in seamlessly preparing Service to the unstoppable change from diesel to electrobus," says the new After-Sales Manager.

Frank Färber, After-Sales Manager since 01.03.2017.

Reinforcement for regional sales management

With effect from 17.10.2016 Spheros Europa GmbH has succeeded in recruiting the services of Michael Raabe as Regional Manager After-Sales. Raabe assumes the territorial responsibility for Schleswig-Holstein, Bremen, Hamburg, Niedersachsen and parts of North Rhine-Wesphalia, formerly covered by Ulrich Könnecke.

Prior to joining Spheros, Raabe was employed in field service for spare parts sales at DAF Trucks Germany. He is a utility vehicle specialist and after qualifying he supervised a utility vehicle workshop. He has also trained as a mechanical engineer.

Michael Raabe,
Regional Manager After Sales

In his new position at Spheros he will be responsible for technical training and assistance in the field, as well as business matters relating to the entire Spheros product portfolio. Raabe is currently at the job familiarization stage, although he is already actively involved in his designated area. “As a triathlete I know that perseverance and goal orientation are the recipe for success. I look forward to the new challenge. One of the particularly exciting areas is the electrification of HVAC systems in buses,” says Raabe.

The territorial subdivision of Germany for the after-sales activities of Franz Bergmaier, Jürgen Hoffmann, Andreas Rösner and Michael Raabe is shown to the right.

Spheros after-sales regional subdivision

New orders

Spheros air conditioners for Transdev city buses

Leading private transport undertaking Transdev has contracted Spheros to install air conditioning in more than 80 buses for city operation.

A start has been made in the Rhine-Main region: in January 2017 Transdev GmbH took over operation of town bus services in Bad Homburg, Oberursel and Friedrichsdorf. The new buses ordered for the purpose are all equipped with Spheros air conditioning units. In early December the City of Bad Homburg took delivery of 40 Citaro C2 Euro 6 solo vehicles, eight Solaris New Urbino 18 articulated buses and three Citaro K solo vehicles. The REVO 300 and REVO 320 were installed in the solo vehicles and the REVO 360 Art in the articulated buses.

Spheros has been advising Transdev in the choice of their air conditioning system since the publication of the tender by the City of Bad Homburg. "The excellent collaboration and commitment shown by Spheros, combined with the environmentally friendly and LCC-optimized air conditioning units were the deciding factor for us," says Max Kaiser (Managing Director of Transdev Rhein-Main GmbH). Due to the combination of state-of-the-art components, the REVO rooftop unit distinguishes itself by high performance, low weight and reduced noise emissions. In addition, the REVO is delighted with the significantly lower life-cycle costs and premium comfort accompanied by extreme robustness.

On the basis of the good cooperation with Transdev, Spheros subsequently received the contract for equipping an additional 37 buses in Wiesbaden, Hochtaunus/Limburg, Rheingau and Flensburg.

Spheros is installing air conditioners in Transdev city buses for the Rhine-Main area.

Trade fairs and Events 2017

Month	Dates	Fair	Location/country
March	07–08.03.2017 29–30.03.2017 23– 25.03.2017	ElekBU 2017 Passenger Transport Trade Fair Transport 2017	Berlin, Germany Tampere, Finland Herning, Denmark
May	23–26.05.2017	FIAA	Madrid, Spain
June	19.06.2017	European Bus Forum	Manchester, UK
October	20–25.10.2017 04–05.10.2017	Busworld Kortrijk Coach & Bus Live	Kortrijk, Belgium Birmingham, UK
November	21–23.11.2017	Czechbus	Prague, Czech Republic

Spheros Minisphere rooftop unit, with a cooling capacity of between 10 and 13 kw with the same length.

The new Minisphere

The easy way to cool minibuses

The Minisphere rooftop air conditioning unit sets a new benchmark in terms of weight, design, performance and efficiency – for all standard minibuses and climatic requirements worldwide.

Offering a cooling capacity of 10 and 13 kW with the same length, the modular Minisphere rooftop air conditioner satisfies all requirements for minibuses worldwide. With a remarkably low weight of 38kg for the 10 kW version, it is 22 kg lighter than its predecessor CC 145 and thus the lightest air conditioning solution available for minibuses. This was made possible by the consistent implementation of a lightweight design of aluminium, without compromising in terms of quality, stability and performance. Due to its light weight, the unit is fast and easy to install, making it especially suitable for retrofitting.

Its flat aerodynamic design harmonises optimally with the vehicle design.

In addition, the unit has an optional heating and/or fresh air function (30% fresh air). The modular Minisphere comes with a central or lateral air outlet position. The basic versions with 10 and 13 kW are immediately available and the versions with heating and fresh air function will be on the market from the first quarter of 2017.

Spheros SC 400/410 control element.

SC 400/410 control element

The Minisphere is regulated and operated by the specially developed SC 400 control element, which features Protection Class IP54 on the front panel and is thus splash-proof.

The SC 400 has an automatic and a manual mode. Temperatures can be set in 0.5°C increments between 17°C and 24°C. Fan speeds can be alternated between 1 and 3 depending on temperature fluctuations. Error codes are shown on the display. All versions of the SC 410 are available with heating and/or fresh air function.

Spheros Thermo H for hybrid, electric, hydrogen and diesel buses.

Hybrid heater Thermo H goes into series production

The Thermo H, available in different performance classes for hybrid, electric, hydrogen and diesel buses, features a diesel as well as an electric burner head.

It thus reconciles the benfits of the two energy forms (electric and diesel) in one device and permits an off- and on-board power supply. This enables emission-free preheating before the start of a journey (power supply off-board) and booster heating at low outside temperatures while on the road (power supply on-board) to avoid unnecessary strain on the traction battery storage. The Thermo H incorporates proven components of the Thermo S and Thermo AC/DC. In addition, electrical booster heating is easily possible in zero emission zones with the combination heater.
The Thermo H is due to go into production in the first quarter of 2017 with the 16kW diesel/7 kW DC versions. Further versions and combinations are available on request.

New filter drier for Aerosphere World and REVO-E

As of March 2017 a new filter drier is to be used for the Spheros Aerosphere World and REVO-E rooftop air conditioning units.

As far as technical data and dimensions are concerned, the new filter drier is identical to the previous model and thus 100% backwards compatible. Performance and functioning of the air conditioning units remain unchanged. The successor differs from the previous filter drier only in its colour: it has been changed from blue to black (see pictures). For spare parts requirements a spare part kit – consisting of filter drier (black) and two enclosed O-rings – is available under the same **Order No. 11117544A.**

Old filter drier

New filter drier

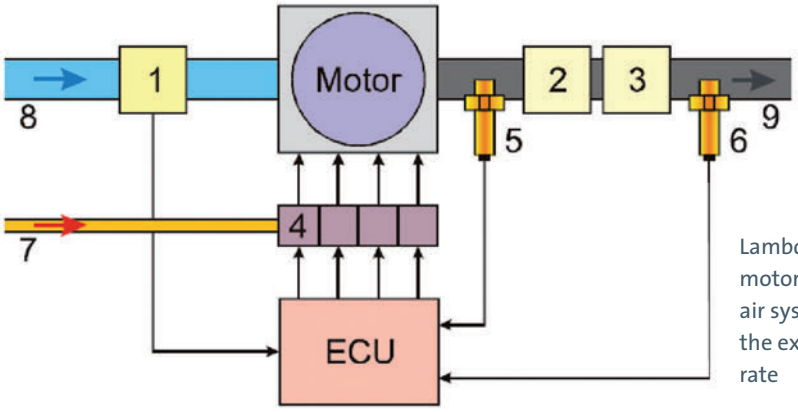
Use of fuels diverging from DIN EN 590 in Thermo, Thermo S and Thermo E heaters

Why do heaters react differently to fuels compared to combustion engines?

Spheros heaters are factory set for conventional mineral diesel fuel in accordance with DIN EN 590. A further one-time adjustment may be necessary when it is put into operation by the customer if the unit is to be used constantly at altitudes of >1500 m, when the combustion air supply and exhaust discharge are adjusted, or for the use of alternative fuels.

In order to satisfy the legal requirements with regard to safety a flame detector is responsible for flame recognition in Spheros diesel heaters. The latter is a phototransistor. Depending on light intensity and spectrum, the transistor is conductive. A status, for example flame on or off, is assigned to each voltage rating via the software located on the controller.
In terms of combustion monitoring this is the only sensor system. Some alternative fuels burn with a different brightness and colour, preventing reliable flame detection by the phototransistor integrated into the heater.

Lambda regulation combustion engine



Lambda control in a diesel motor takes place via the air system by regulation of the exhaust gas recirculation rate

1 Air flow meter
2 Pre-catalyst
3 Main catalyst
4 Fuel injection valve
5 Lambda probe before cat
6 Lambda probe after cat
7 Fuel feed
8 Air feed
9 Exhaust removal

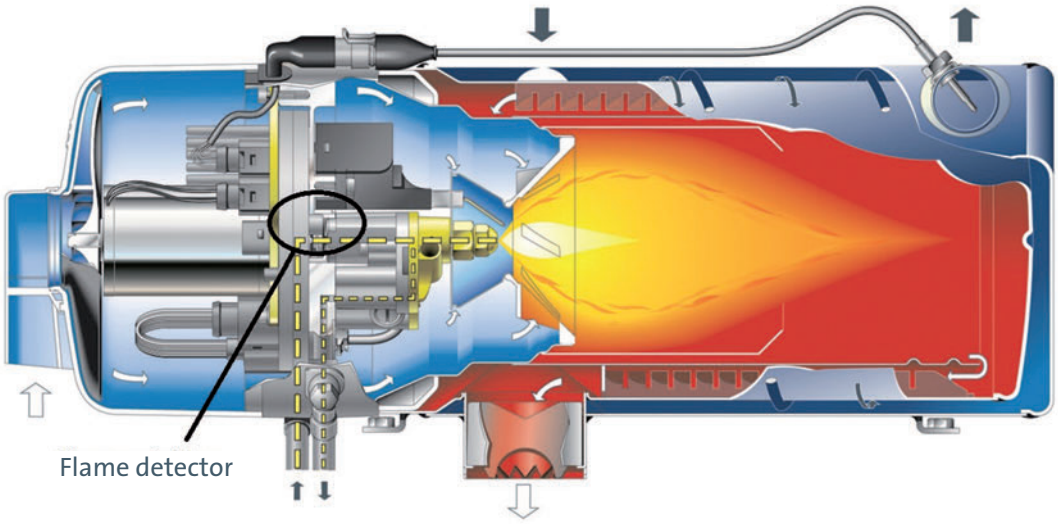
Modern combustion engines, in contrast, incorporate a sophisticated sensor system. The fuel/air mixture is constantly regulated, for example via the lambda control, air mass measurement (meters air pressure and temperature) or by monitoring the injected fuel.

This is an engine-internal combustion under increased pressure.

In combustion motors the injection time and amount are constantly optimised, depending on fuel or fuel mixture.

All specifications for heater fuels are to be found on the Spheros website at:

http://www.spheros.de/Service/Technik-Updates.html



Caetano City Midi: Spheros REVO Global 250 supersedes Aerosphere Midi

In addition to touring coaches and 12m city buses, Portuguese manufacturer CaetanoBus of Vila Nova de Gaia also builds city buses in midi format. For several years Spheros has been supplying the Aerosphere Midi air conditioning unit with full equipment for the successful City Midi, based on the MAN A66 chassis, for the European market.

Spheros REVO Global 250.

At the end of 2016 the Aerosphere Midi was superseded by the newly developed REVO Global 250. The focal aim of this development was that it should be usable worldwide on virtually any bus roof. A heater/ventilator version with water valve is being installed in the Caetano City Midi.

In addition to weight savings of approx. 18kg compared to its predecessor, with the use of SMC components and a flat-tube condenser and the conversion from copper to aluminium piping, the REVO Global 250 achieves a higher air output (approx. 300m²/h unimpeded) with lower power consumption. At the same time the control unit has been changed from the GL-W521 to the current SC600. The first systems were delivered in November 2016 and have been installed as a standard since January 2017.

Spheros REVO Global 250 on the Caetano City Midi.

Fuel pumps for Spheros heaters

The optimized fuel pumps are able to handle fuel blowholes significantly better. The latter can originate from leakage in the bus fuel feed, and also from gas evolution in the fuel in the event of elevated low pressure.

Ignition misses and thus the risk of heater locking are reduced to a minimum with the new pump.

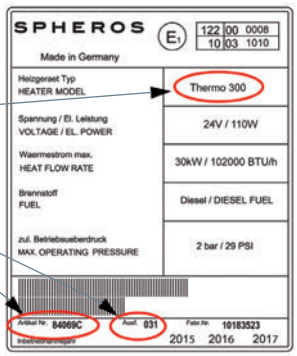
Modifications:
Brass cap changed to aluminium.
Fuel pumps can be exchanged 1:1 in the field.

NEW —> Spare part kits contain a clutch and three fastening bolts.

Heater			Fuel pump	Spare-part-kit fuel pump
Thermo	23-35 kW	2-String	82233_	11112778D [1]
	23-35 kW		11114892_ 11120306_	
	23-35 kW		11114892_ 11120306_	11112779D incl. heating cartridge and thermostat
Thermo 350 Ausf. 190	35 kW		11120307_ 11114893_	11115017C [2]
Thermo S	16 kW	2-String	11114895_ 11120310_	11118533B
	23-35 kW		11114896_ 11120309_	11118534B
	40 kW		11114897_ 11120311_	11118535B
Thermo E	20-32 kW	2-String	11113950_ 11120332_	11118536D

[1] Vertical burner Thermo 230.060 or. 300.060 -> please order ET-Kit 11112780D (incl. thermostat)
[2] 19V version; clutch 11117847B please order separately; not included in the kit 11115017C
→ For 1-string pump demand, please contact us.

Data required for quick spare part identification:
- Heater type: e.g. Thermo 300
- Model: e.g. 031
- Article no. or ident no. : e.g. 84069C



Electric buses for private transport operator Salza Tours

Medium-sized bus operator Salza Tours is a third generation family company based in Bad Langensalza, Thuringia. With a fleet of 20 buses the company operates eight of its own and two further routes as sub-contractor in the districts of Unstrut-Hainich, Gotha and beyond.

The buses operating on two urban routes in Bad Langensalza alone clock up an annual mileage of 160 thousand kilometres. Salza Tours is also engaged in the travel and hire bus business. Besides this principal activity, the company places great emphasis on making an active contribution to environmental protection in its region. The decision was made to purchase two electric buses built by Sileo, which have been in service since June 2016. Salza Tours is the first private company to invest in sustainable town centre bus services. Spheros visited the company's headquarters and talked to Lutz König, Managing Director of Salza Tours König OHG, about the reasons for this investment and experiences in using the electrobuses.

Salza Tours has been operating two electric buses built by Sileo since June 2016.

Spheros: Mr König, which electric buses are being used and how do you justify your choice?

Lutz König: We are presently using two Sileo S10 electric buses. Due to their powerful electric drives, the low-floor buses with a length of 10.7 metres are ideally suited to the route profile in Bad Langensalza. The two S10 vehicles manage the daily service schedule without the need for intermediate charging. The battery-operated buses are recharged at the depot overnight using the Sileo charging technology specially designed for the vehicles and are again ready for operation about six hours later. This holistic operating concept was the deciding factor for Salza Tours König OHG.

How did the project materialise?
We had already tested buses with hybrid drives beforehand, but were not fully convinced by their performance. It quickly became clear that we should be aiming at purely electric powered buses, so in December 2015 we invited tenders for two E-buses from across Europe. In Sileo we quickly found a bus manufacturer who offered a solution to our individual requirements: the lithium iron phosphate traction battery has a capacity of 200 kWh and guarantees a range of at least 200 km. In tests a range of 240 km was even achieved, as electrical energy is generated and stored when the vehicle brakes.
In addition, on warm summer days we run the air conditioning unit continuously. Despite the use of the air conditioning unit, with Sileo electrobuses 20% of energy reserves is still available at the end of the day.

Are there other reasons you opted for this model?
Because the storage capacity of the batteries is limited, but driver and passengers expect a comfortable temperature in summer and winter, we needed a bus that guarantees both. In winter we opted for the fossil fuel-based bus heater Thermo 300 from Spheros, as booster heating with diesel was inevitable if the interior of the bus was to be warm during operation. In summer, when the buses heat up quickly, an electric air conditioning unit was needed that goes easy on the existing energy reserves and at the same time creates a pleasant climate. With the Spheros Citysphere, which regulates itself fully automatically on the basis of the outside temperature, this was possible.

How long have the electric buses been in use? On which routes are they operating?
Since June 2016. The buses operate daily on our two routes in Bad Langensalza town centre from 6 am to 6 pm.

What expectations did you pin on the project?
First of all we wanted to comply with the environmental concept of the spa town of Bad Langensalza, to ensure emission-free public transport. Economic aspects also play a role of course, e.g. lower maintenance and energy costs compared to conventional drives.

Will further electric buses be used?
Three buses are needed for town services in Bad Langensalza, i.e. a third electrobus is on order.

What do you consider to be the biggest advantages and disadvantages of electric buses?
The biggest advantage is, of course, zero emissions! The biggest disadvantage is the limited storage capacity of electrical energy. We expect some considerable developments in this field in the future.

What is the future of electromobility?
For the future we would wish for a Spheros Citysphere unit with a heat pump, so that fossil fuel heating is needed only at temperatures below 5° C.

The heater type plate and its significance for the general operating permit

In the past there have been numerous cases of heaters with damaged, in part illegible or non-existent type plates being used in vehicles.

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

- Vehicles and
- Components for use in vehicles

must comply with the specifications and general technical requirements for the type approval of these vehicles and components.

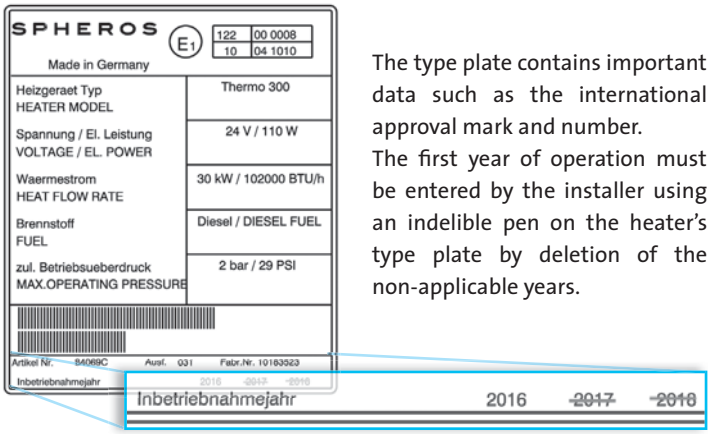
These regulations and requirements are set forth in national and international directives and revised according to technical progress so that they always correspond to the current state of the art.

ECE Regulation No. 122 specifies the requirements for heaters with regard to operational safety and emissions. ECE Regulation No. 10 sets forth the requirements for electromagnetic compatibility of vehicles and their components. Spheros heaters are tested and approved in conformance with Regulation No. R10 (Interference suppression) and Regulation No. R122 (Heating systems).

Because the legislators require the existence of a type plate, this must be checked at each maintenance routine. Otherwise not only the heater, but also the vehicle is liable to lose its general operating permit.

Essential regulations for Spheros products:

Electromagnetic compatibility (EMV):	72/245/EWG (2009/19/EG)	ECE-R10 (Revision 03)
Heating systems:	2001/56/EG (2006/119/EG)	ECE-R122 (Revision 00)
Combustion behaviour for interior materials:	95/28/EG	ECE-R118 (Revision 01)



The type plate contains important data such as the international approval mark and number.
The first year of operation must be entered by the installer using an indelible pen on the heater's type plate by deletion of the non-applicable years.

The type plate contains important data such as the international approval mark and number.

Gas governor replacement in GBW applications

The new Spheros Thermo G gas heater has been in series production since early 2016, and an elementary component is the gas governor. The latter regulates the gas pressure in accordance with ECR R110 in a first stage from 200 to 8 bar and in a second stage to the ambient pressure.

Because the compact governor has proven itself in series production, it is also recommended as a replacement governor for existing GBW applications. At this point we would like to stress the need for a gas governor replacement every four years, as required by the manufacturer.
To make replacement easier, complete conversion kits have been generated, and these are immediately available. The correct diameter of the gas supply line is critical for the right order number. Special Swatlock screw fittings in different sizes are needed for Version 8-10-12. A conversion guide is being prepared and will shortly be available in the download area.

Thermo G 300 with gas governor im series-installed state.

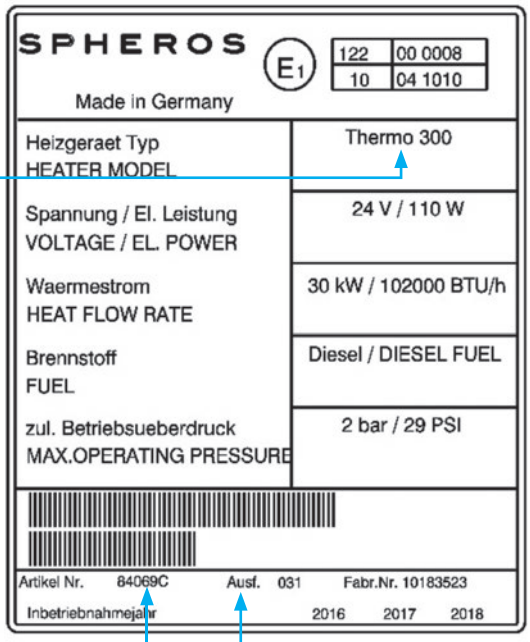
Coolants (water circulation)

The following coolants have been approved by Spheros.
The approval of further products can be requested from Spheros by the vehicle manufacturer.
Spheros heaters and AC applications may only be used with an approved coolant.
The proportion of coolant must be at least 30%.

Producer	Brand	Info
BASF	**Glysantin® G48®**	Coolant from the Glysantin® series. Hybrid technology with inorganic and organic inhibitors for the corrosion protection in the cooling system. Colour -> **bluish green**
BASF	**Glysantin® G40®**	Coolant from the Glysantin® series with Si-OAT technology. Combines the benefits of siliceous and silicate-free coolant protection. Colour -> **reddish violet**
DETROIT DIESEL	**POWER COOL®**	Coolant is a special blend of ethylene glycol with a pre-charged dose of supplemental coolant additives (SCA's) Colour -> **pink**
PETRONAS LUBRICANTS	**PARAFLU HT®**	Coolant, antifreeze and protective concentrate based on ethylene glycol, organic corrosion inhibitors and aversive substances. Colour -> **yellow**
VOLVO	**VOLVO COOLANT VCS®**	Coolants with new inhibitors: VCS provides better protection against corrosion and deposits; it acts against cavitation and galvanic corrosion. Colour -> **yellow**

Heater version list

This updated list will provide you with details of the correct replacement burners for all Spheros Thermo heaters. The list contains the corresponding fuel hoses, wiring harnesses and replacement controllers.



The full version list is to be found in the Thermo 230 / 300 / 300 parts lists and as a separate document for downloading from the Spheros homepage.

See:
http://www.spheros.eu/Service/Spare-Parts-amp-Accessories/Heating-systems/Thermo.html

What is a replacement burner?
These burners replace the existing (series) burner head.

Note: Replacement burners include wiring harnesses.

What is an exchange burner?
These are factory refurbished burners that have been returned by customers (deposit system). After refurbishing all burners are correctly adjusted, tested and a new type plate affixed.

Note:
Information on the deposit system can be found in the Burner Replacement Brochure at:

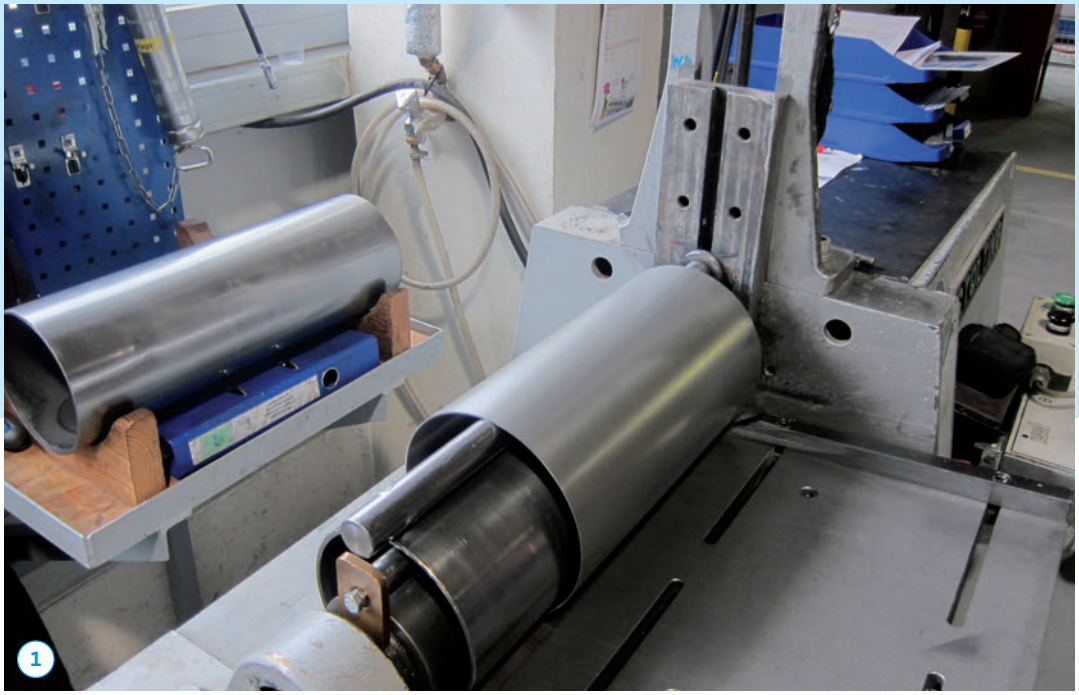
http://www.spheros.de/Service/Ersatzteile-amp-Zubehoer/Heizsysteme/Thermo.html

Heizgerät-Typ / heater typ	Ausführung / model	Artikel-Nr. / ident no	Kabelbaum 1 / wiring harness 1	Kabelbaum 2 / wiring harness 2	Brennstoff-schlauch S / fuel hose S	Brennstoff-schlauch R / fuel hose R	Düsenstock-vorwärmung / nozzle block preheater	Steuergerät / control unit	Ersatz-Brenner / replacement burner	Austausch-Brenner / refurbish burner
Thermo 230	035	89276	82606	93019	87787	82235	no	63482	65475	11122155A
Thermo 230	036	63647	63827	9000940	92222	92221	yes | 86711	63482	72103	11122155A
Thermo 230	040	9006594	89468	93019	87787	82235	yes | 86711	63482	xxx	11122155A
Thermo 230	041	9006833	82606	93019	82234	82235	yes | 86711	63482	9012282	11122155A
Thermo 300										
Thermo 300	033	85182	82926	93020	87787	87786	no	63482	87997	11122173A
Thermo 300	034	88722	82606	93019	87787	82235	no	63482	65476	11122173A
Thermo 300	035	88723	89468	93019	87787	82235	no	63482	65476	11122173A
Thermo 300	036	90219	82606	93019	87787	82235	yes | 86711	63482	xxx	11122173A
Thermo 300	113	9003099	66759	xxx	xxx	xxx	yes | 86711	97806	9000081	11122176A
Thermo 350										
Thermo 350	031	85173	82922	82923	xxx	xxx	yes | 86711	97806	xxx	11122184A
Thermo 350	032	85783	82606	93019	82234	82235	no	63482	65477	11122181A
Thermo 350	033	85183	82926	93020	87787	87786	yes | 86711	63482	63564	11122181A
Thermo 350	034	89734	82926	93020	87787	87786	no	63482	63564	11122181A
Thermo 350	047	64810	82606	93019	87787	82235	no	63482	65477	11122181A
Thermo 350	049	65694	87825	93020	82234	82235	no	63482	97564	11122181A
Thermo 350	050	66204	82606	93019	87787	82235	yes | 86711	63482	65477	11122181A
Thermo 350	051	66203	82926	93020	87787	87786	yes | 86711	63482	xxx	11122181A

SPHEROS
a Valeo brand

Air conditioning
Heating systems
Pumps
Hatches / fans
Bus body electronics
Parts & service
System components

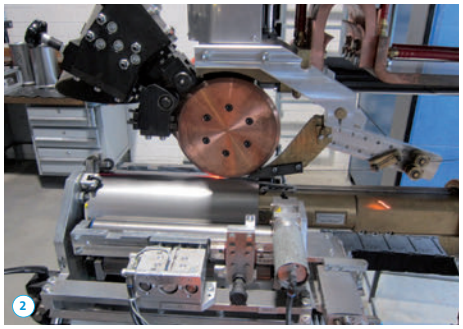
Today's topic:
Manufacture of heat exchangers



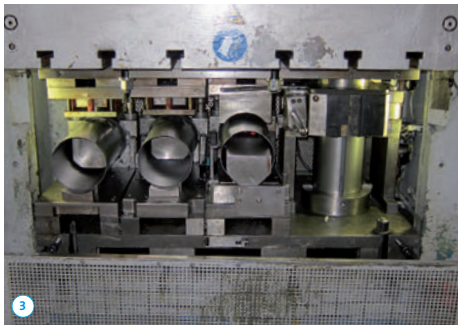
In the first step the sheet metal for the inner and outer casing is rounded.

Automated production of heat exchangers

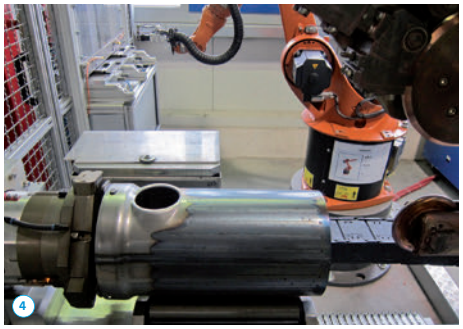
The ongoing optimization of workflows and cycle times is vitally important if we want to cope with the steadily increasing demand for water heaters in the performance classes 16-40 kW – electrical and diesel-operated – currently running at > 40,000 per year. In order to satisfy all future requirements in terms of quality and delivery performance, Spheros is investing in an automated industrial installation for the production of heat exchangers. We present this welding robot, developed in close collaboration with a renowned manufacturer and put into operation according to Spheros specifications, in the individual production stages:



Then the inner and outer casings are welded by roller seam welding machine.



In the next work stage the inner and outer casing are shaped.



Then the fins are welded into the inner casing with the aid of a roller seam welding machine

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Manufacture of heat exchangers

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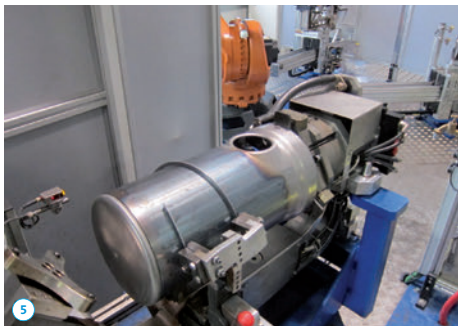
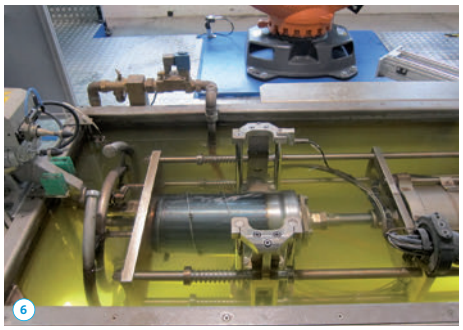
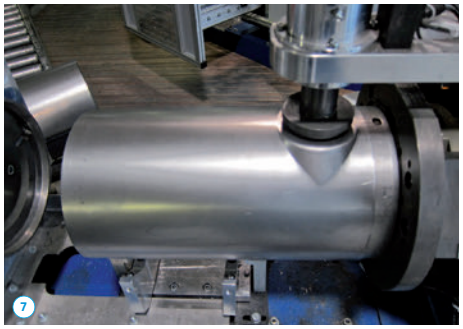
... fins are welded into the inner casing.



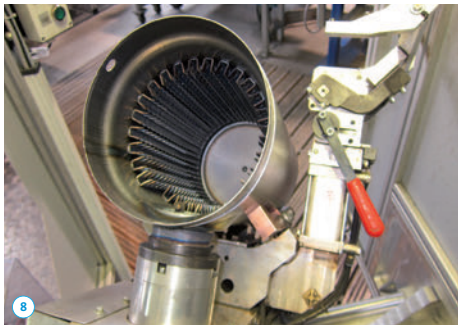
The parts to be welded are brought to the welding work station with the aid of a handling robot; then the inner bottom and water baffle are welded to the inner casing.



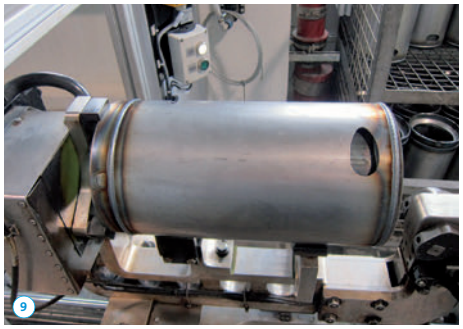
Then the robot deposits the welded part in the testing fixture, where it is automatically tested for 100 % air-tightness.



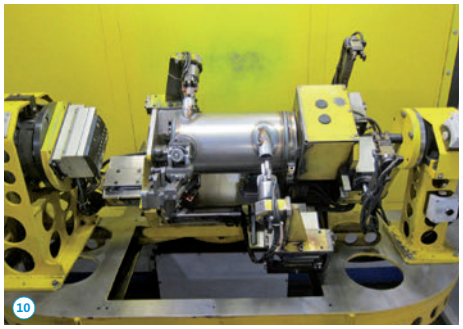
The water jacket is pressed onto the inner casing.



The exhaust gas nozzle is fixed in position and welded to the prefabricated assembly.



In the last work stage the outer bottom and centering ring are welded to the prefabricated assembly.



Then the assembly is conveyed to the next production unit, were all the necessary parts are welded by a welding robot and tested for 100% air-tightness.

In the last stage the heat exchanger is painted.

The finished heat exchangers are delivered to the heater assembly station.