

Press Release Busworld 2015

*Air conditioning technology
that opens up new ways*





Quality through experience

Heat pump with CO₂

- the first 100.000 km have been completed

Schwalmstadt, October 2015 - Konvekta is the inventor of air conditioning units and heat pumps using CO₂ as a refrigerant. With the second generation of the Konvekta CO₂ heat pumps, the benefits that this system brings can be further optimised.

For generations, Konvekta has stood for innovative ideas that decisively influence the entire air conditioning industry in the automotive and commercial vehicles sector. As the inventor of the bus air conditioning system operated with CO₂, the air conditioning specialist based in Hessen has not only considered the aspect of easy handling and low service costs as particularly important, but has also been influenced by the highly pronounced concern for the environment, right from the very start of its success story. The latest development of Konvekta AG is the „Generation 2“ heat pump system with the R744 (CO₂) refrigerant.

The first generation Konvekta CO₂ heat pump

The first generation of the R744-operated Konvekta CO₂ heat pump has already covered a distance of well over 100,000 km in the last few months. Together with select partners, 20 first generation heat pumps have more than certified their potential in field tests. The Konvekta CO₂ heat pump system has taken over the entire thermal management in the electric buses, from temperature control for passengers right up to that for the sensitive batteries. The service life of the sensitive and expensive batteries is extended and the range is increased by maintaining the optimal temperature.

The second generation Konvekta-CO₂ heat pump

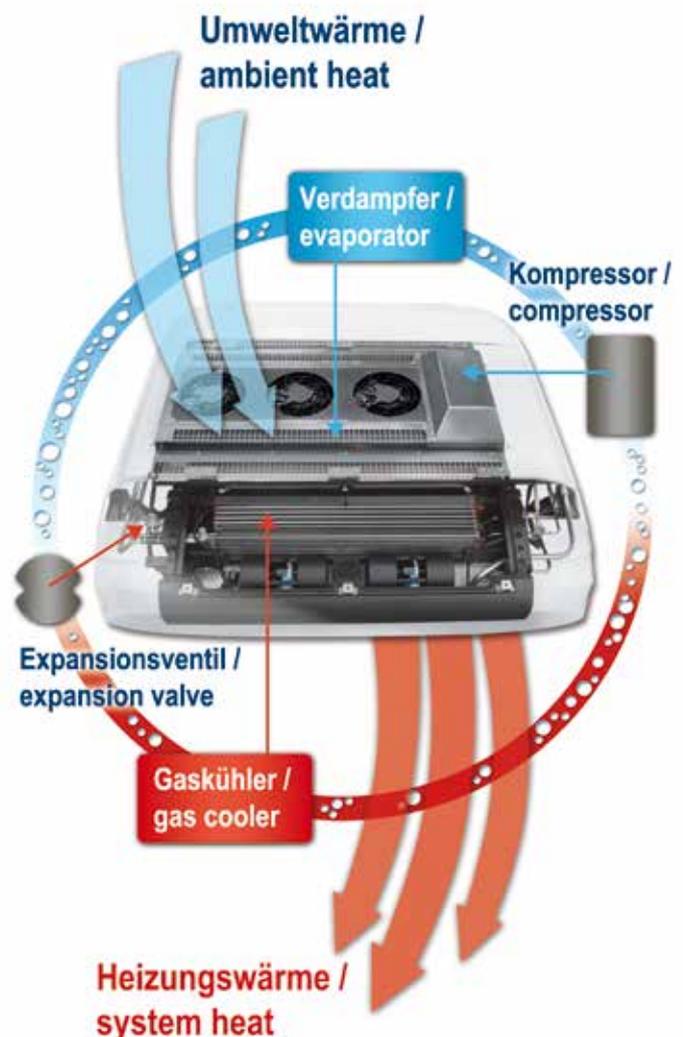
The second generation of the Konvekta CO₂ heat pump was developed based on the result of all of these findings. Several requirement profiles that could not be specified clearly based on lack of experience have now been fixed. Depending on the traffic operation and infrastructure, there are currently different options for charging the batteries. The Konvekta CO₂ heat pump system has been installed on vehicles with different charging options. These range from vehicles with a system for charging at night right up to inductive quick charging within a few seconds. Each charging system and every different type of vehicle now has a unique and clearly specified thermal management.

Even in the roof-mounted unit, various optimisations have been undertaken in the Konvekta CO₂ heat pump system. In order to enhance the performance, individual components have been reconstructed and the control response has been refined for a smooth transition from the heating to the cooling mode.

Service and Maintenance

There is substantial savings in cost and time with respect to service and maintenance for systems based on CO₂. This is attributable to the fact that there is no necessity of recovery or disposal of this refrigerant (R744) arising after any repair or maintenance work. Another benefit lies in the use of the UltraLight technology. The extremely lightweight and robust high-performance material forms the basis for holding all components as a result of which replacing components becomes conceivably simple. The filter, fans and other components are replaced within a matter of seconds.

The first field test with the second generation of the Konvekta CO₂ heat pump has already commenced. After conducting a series of internal tests successfully, the unit is undergoing trial runs at the municipal utilities of Klagenfurt.



Urban mobility in change within the sustainable development

Air conditioning units for buses with refrigerant CO₂

In many cities the change towards sustainability and quality of life are clearly perceptible, the mobility development playing a major role in this. Future-oriented public transport companies work on strategies with innovative transport concepts in order to arrange their fleets more efficiently and in a more environmentally friendly manner.

Konvekta, manufacturer of air conditioning units for buses and pioneer in the field of research of environmentally friendly refrigerants, admitted itself to the refrigerant R744 for many years already. R744 (carbon dioxide/CO₂) is excellently suited as alternative to the present refrigerant R134a.

Natural substance CO₂ (R744)

The environmentally friendly alternative R744, with a global warming potential of factor 1 distinguishes itself by a very high volumetric cooling capacity. In comparison to R134a, significant advantages arise regarding cooling capacity and effectiveness due to better compressor efficiency and a better heat transmission. The naturally occurring substance CO₂ (R744) is unlimitedly available and, due to its characteristics – incombustibility and non-toxicity - optimally suitable.

The local public transport sector is the driving force behind many ecological developments; this is also the case in the field of research regarding R744-fed air conditioning units. Together with the air conditioning manufacturer Konvekta AG, situated in the city of Schwalmstadt in the northern part of Hesse, this “natural” path was followed already many years ago. Konvekta is manufacturer of ecological air conditioning systems and inventor of the R744-operated air conditioning unit. One of the first field tests with such an air conditioning unit was started by Konvekta in 2004 already with the company Saar-Pfalz-Bus GmbH.

At present eleven different transport companies use 52 vehicles with the environmentally friendly air conditioning technology in urban and interurban areas. The buses are operated daily, so that R744 air conditioning systems underlie a realistic exposure. The operators as well as bus drivers thus have the possibility to compare buses with conventional R134a and innovative R744 technology in their fleets.

The refrigerant R744 is not only profitable for the environment

Raimund Loogen, workshop manager of the Lower Rhine Public Transport Company (NIAG) gets to the heart of it: “the refrigerant R744 is not only profitable for the environment. The costs for refrigerant and maintenance, too, are clearly lower, as it can be released easily and a filter dryer is no longer necessary either. Furthermore the handling is easy and safe. We, that is ÖPNV, are in the focus of public attention and are sign board of the region. Five years ago we have decided on the first buses with an R744-fed air conditioning unit out of a sense of responsibility. We are very proud of these R744-buses. They run faultlessly and indeed cause only about one fifth of maintenance costs compared to a vehicle with a conventional R134a-unit.”

Simple and safe handling – R744

The simple and safe handling of R744 reduces the service times by more than half compared to R134a. As R744 is not a chemical refrigerant, it is not subject to the Chemicals Climate Protection Regulation and no costly recycling and disposal are needed. It can be released into the cycle of materials, from where it was extracted, without hesitation. R744 – CO₂ is a profit for the environment and the operators’ budgets in equal measure.



Compact and efficient

The second generation Ultra Light II

– 10% less refrigerant

Schwalmstadt, October 2015 – With its second generation range of air conditioning units - the UltraLight range (UL II) - Konvekta AG is providing an intelligent solution for bus air conditioning that delivers greater efficiency in terms of time and cost. Thanks to an extremely tough construction material developed in-house, the new model range is considerably more lightweight, economical and low-noise.

The UltraLight model range (UL model range) is based on a simple, installation-friendly and modular building block system. The new air conditioning range is characterised by a highly modern design that takes aerodynamic and aesthetic aspects into consideration and is extremely lightweight. Indeed, the lightest design of the newly developed UltraLight II weighs approximately just 103 kilograms. In addition, the engineers working on this model range have achieved reductions in the noise level by 5 dBA through the use of a special construction material.



Energy consumption reduced substantially

While developing the new UltraLight II range, Konvekta AG placed its focus on economy and efficiency. In this way, the innovative manufacturer of air conditioning units has developed a lightweight and compact air conditioning unit thanks to a specially developed high-performance material. The special material ensures leak-tightness of the construction by its high insulating effect and reduces the energy

consumption considerably. As a result, the system requires 10% less refrigerant compared to conventional units. Moreover, the second generation UltraLight is not sensitive to vibrations caused by the track since all components are located in their respective enclosures.

In addition, the base ensures less ingress of dust and impurities into the unit. Over and above this, the components are now more easily accessible and the design uses the plug-in principle without unnecessary screw-type holders. Replacing components is now conceivably easy; by using the „Drag and Drop“ principle, parts can be removed and reinserted. This saves the bus operator 25% in time required for service work.

The power range of the UL model range goes from 24 KW right up to 45 KW of cooling power and an equally generous heating power of 30 KW to 48 KW.

Just as the predecessor model, the new range from Konvekta can also be supplied with the environmentally friendly refrigerant CO₂ (Carbon dioxide/R744) and is completely recyclable.



The new electric roof top unit KL20E

Small and efficient - proven for decades

Schwalmstadt, October 2015 – The smallest roof top compact unit of Konvekta, manufacturer of thermo systems, gets a new design. „We were inspired by customer requirements and the result is visually attractive, efficient and has best installation and service characteristics“, states the air conditioning specialist from Schwalmstadt about the compact and elegant air conditioning unit.

The roof top compact unit KL20E with 4,3 KW has proven for decades. Based on these experiences the concept has been developed and optimized. The KL20E is fast and easy to install or retrofit in 3 hours maximum. Depending on the bus type this unit can be placed almost everywhere on the roof, also optionally in the openings of the roof hatches. The air conditioning system is pre-filled with refrigerant and electrically wired. By the compact design and placement of the compressor inside the unit no refrigerant lines have to be installed in the vehicle. This takes care of the bus operators' budget and additionally contributes to protection of the environment as the system guarantees highest possible tightness.

As usual the technical designers of Konvekta are not only aware of a modern and puristic look but also functionality is taken for granted. That's why the second generation of KL20E is more flat and the cover is designed streamlined for best aerodynamic features. With its weight of only approx. 50 kg an increased fuel consumption is hardly noticeable. By the new soundproofing mounting of the unit noise emission has been reduced considerably.

As important as the economic advantages that this system offers to the bus operator is a comfortable climate inside the vehicle for passengers and driver. For this purpose the air distribution panel got a fresh and new face. The new extremely flat inside housing with titanium effect adapts optimally to the interior of a modern bus. The air is distributed evenly and completely inside the vehicle, a pleasant cooling effect is felt immediately without an uncomfortable draught.

As the air filter is optimally integrated in the concept, already the intake air is filtered. During service the cover of the air distribution plate is released by quick fasteners and the filter in the interior of the bus is changed in a few minutes. Accessing the bus roof is no more necessary.

The concept KL20E is completed by the new control unit Konvekta KS 52. By its compact design this climate control unit is easy to install in the section of the drivers work place inside the vehicle. The KS 52 is easily and clearly to operate. It offers two different operating options – the automatic temperature control where a constant value is preset or outside-temperature-dependent control. Also manual control is optionally available.

From a great optic to functionality and easy servicing - all requirements of bus operators and manufacturers have optimally been implemented. The concept KL20E satisfies every wish.



Enhanced energy efficiency

The new SL range

Sustainable bus air conditioning with energy efficient air conditioning equipment

Schwalmstadt – The air conditioning specialists at Konvekta AG have developed a future-oriented range of air conditioning units with StreamLine (SL), an innovation that is unrivalled in terms of design and function. Fleet operators not only save hard cash with the enhanced energy efficiency of the new SL range but they also benefit from the extended range of power.

Konvekta AG, the manufacturer of innovative and future-oriented air conditioning units for buses, has undertaken trend-setting advanced development on its roof-mounted StreamLine (SL) air conditioning unit and adapted it to the growing requirements of the market: Thanks to its special lightweight construction material, the SL air conditioning units are now up to 20% lighter in weight than their predecessor models – this is equivalent to approximately 45 kg. Moreover, the new SL range has become 500 mm smaller with the innovative and future-oriented system design.

100% fresh air from up to eight blowers

The elegantly shaped design combined with the large variety in power of the new air conditioning units makes them fit for application in all climatic zones. The existing power range of 35 and 39 kW has been supplemented by two variants with 41 and 44 kW respectively and up to eight evaporator blowers. Consequently, lower temperatures are achieved as well as improved air distribution and accelerated cooling down. While the maximum share of fresh air in conventional units is only about 20% in most cases, the unit of the SL range works with up to 100% fresh air that is facilitated by using an electrically controlled valve.

Lower maintenance cost and effort

The new air conditioning hoods of the SL range consist of several parts and can be opened easily and comfortably during service. Therefore, all areas of the unit are easily accessible and reduce the service time by up to 40%. The entire range of the SL family is based on the same model of the housing and consequently the connecting points are always the same. This means that any power variant can be installed quickly and easily on the roof of the bus – with the same preparation work on the roof. Moreover, all units can be combined with one heating system thanks to the more compact construction.



Opening ceremony for the new technology centre

Schwalmstadt, 25th September - Konvekta AG in Ziegenhain is the leading manufacturer of air conditioning units for buses, construction and agricultural machinery, as well as refrigerated rail and transport vehicles.

With the symbolic ceremony, construction work for the new technology and innovation centre commenced on Friday, 25th September. „This centre is about more than just safeguarding our market position, it is a clear commitment to the business premises at Schwalmstadt“ emphasised the Executive Management at Konvekta AG.

In future, the in-house air conditioning devices and heat pumps will be tested and optimised in the new technology and innovation centre. Equipped with the most modern technology, all of the future requirements of the customers shall be met in the best possible way. With the ever-increasing demands of the market and the tougher competition in the air conditioning industry, Konvekta is safeguarding its long term position with this new construction.

Apart from offices and presentation rooms on two floors, as well as a control centre on the upper floor, there shall be an exhibition and presentation area for customers and visitors. There will also be a vehicle air conditioning chamber on the ground floor for vehicles to drive in, measuring a total length of 24 metres and a height of 5.5 metres that is designed for the most diverse types and sizes of vehicles. The new build-

ing meets the most stringent requirements, being divisible in three independently functioning test regions or even as a large area chamber for special vehicles, such as, for example, double-decker and articulated buses.

The air conditioning and heating units are tested for their suitability of use under the most diverse conditions of temperature and climate – wherein even solar radiation is simulated and a temperature range of -25 °C up to +50 °C can be reached. In the additional function and performance test benches, individual components can be tested both stringently and comprehensively. In the future, even the service life can be determined in test benches especially set up for this purpose.

The quality of the products is crucial for the success of a company. The new technology and innovation centre will ensure the quality of the products and also make a significant contribution to the optimisation of the manufacturing processes.

The new premises will be ready to move into at the end of April 2016 and the initial schedules for vehicles, air conditioning devices and components shall be planned for May 2016 at the latest.



Konvekta AG
Am Nordbahnhof 5
34613 Schwalmstadt
Germany

phone + 49 (0) 66 91 76-0
fax + 49 (0) 66 91 76-111
e-mail claudiamittelstaedt@konvekta.com
www.konvekta.com

Presseinformationen / Press Release:
<http://www.konvekta.de/press.html>



**Träger des
Deutschen Umweltpreises**
Laureate of the
German Environment Award



**Certified according to
DIN EN ISO 9001 / DIN EN ISO 14001**

Konvekta AG · 10/15 · Irrtum und technische Änderungen vorbehalten
Konvekta AG · 10/15 · Excepting error and technical changes