

## **CELSINEO – Start for unique modular trailer cooling**

- **Final validation and field test phase for unique Celsineo cooling concept to be successfully completed**
- **Sales launch planned for January 2021**
- **Patented system of three independent refrigeration modules demonstrably increases vehicle availability, flexibility and efficiency**
- **"One-Stop-Shop" service concept successfully implemented**

**With Celsineo, Liebherr and the Krone Commercial Vehicle Group are launching a new type of cooling unit for trailers on the European market. The sale will begin at January 2021 and will be handled by the international Krone sales consultant network. The technical advantages of Celsineo have been successfully tested and proven in an extensive field test under real operating conditions.**

### **Sales launch after intensive field tests**

Since the launch of the Celsineo 2019 brand, the Celsineo cooling unit has undergone extensive field tests with renowned customers in Germany, Austria and France. It proved to be very stable in operation and - as expected - easy to maintain. In addition, extensive tests in climate chambers were carried out to cover even extreme operating conditions. The Celsineo system was thus not only put through its paces, but in some cases even sustainably improved. A few examples:

- The pulldown time is further optimized in diesel operation. The performance of Celsineo can therefore measure up to or even exceed that of corresponding competitor products.
- - The pulldown time when operated via an external 400-Volt power supply even exceeds the performance in diesel operation. Celsineo is therefore best-in-class in electric operation.
- - An improved software configuration for control behavior and energy management allows even more sensitive implementation of the selected set temp, while at the same time reducing energy consumption. An intelligent defrost strategy ensures highly efficient defrosting, and in regular operation the smallest possible temperature fluctuations in the trailer.
- - The service intervals could be increased from 2,000 to 3,000 operating hours. The reason is the successful validation in field tests.

Task force teams from Liebherr and Krone accompanied numerous test drives. Intermediate results of the tests were repeatedly documented and evaluated under different conditions and various software and hardware versions were implemented and tested.

Each individual Celsineo device is subjected to extensive tests and analyses before delivery. Potential "teething troubles" of new technologies can thus be detected and avoided at an early stage - for maximum benefit in practical use.

## **Redefining Service**

Celsineo uses the very well established and continuously growing Krone service network in Europe, which is constantly being expanded with Celsineo service competence. The Celsineo service partner qualifications are concentrated along the main traffic routes in Germany, Austria, Czech Republic, Poland, Hungary, Netherlands, France, Spain and Denmark.

In the next stage of expansion, the service partner network will be extended and consolidated through Norway, Sweden, Switzerland and Italy.

## **„One-Stop-Shop“-principle simplifies maintenance and service**

Service and maintenance of the trailer and the Celsineo refrigeration unit can be carried out in a single visit to the workshop. There is no need to visit different workshops and the use of a certified refrigeration engineer is no longer necessary. Thanks to its hermetically closed refrigeration circuit and extremely low refrigerant quantities (only 1.15 kg per refrigeration module), Celsineo does not require annual leakage checks of the refrigerant circuit. These are required for conventional refrigeration machines. Waiting and downtimes are thus significantly reduced and the operating time is maximised.

## **Future-proof high-end-technology**

At the heart of the innovation at Celsineo is modular cooling: three independent refrigeration modules allow for a varied control strategy and also ensure continuous cooling capacity. This ensures high efficiency both at full load and during partial load operation, which is frequent in practice. Cooling and defrosting are possible at the same time with Celsineo: two cooling modules cool, and one is in defrost mode. This effectively minimises the dreaded temperature peaks during defrosting cycles. In addition, a permanently stable temperature curve is achieved, which always keeps goods in the cargo area at the ideal temperature. The modularity of the unit is thus the basis for maximum availability of the cooling system as well as flexibility and efficiency.

The Celsineo refrigeration modules are designed for operation with the ozone-neutral refrigerant R452A, which has a low global warming potential (GWP). It fulfils all current European Union requirements, can be used in the long term and is safe. The diesel engine is dimensioned in such a way that no expensive and maintenance-intensive exhaust aftertreatment is required.

## **Celsineo shows successful cooperation between Krone and Liebherr**

The two companies combine their expertise and many years of experience in refrigeration, as well as in the manufacture and marketing of refrigerated semi-trailers and the associated service. The unique concept combines future-oriented technology, a modern design and a high quality of all components.

The Liebherr plant in Korneuburg near Vienna, Austria, is home to research and development as well as the overall technical strategy of Celsineo. Series production takes place in a European value-added chain in Liebherr plants within the EU.

Customer service and sales of Celsineo cooling units are handled by the Krone Sales Team throughout Europe. Celsineo is part of an attractive complete package, consisting of a cooling unit, Krone CoolLiner

trailer, Krone Telematics (KSC ProPlus COOL Dialog incl. Krone TR temperature recorder and sensors) and a maintenance contract for the cooling unit.

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**Liebherr – pioneer for future-orientated innovations**

The Liebherr Group is a family-run technology company with a widely diversified product range. The company is one of the largest manufacturers of construction machinery in the world, but also offers high-quality, benefit-oriented products and services in many other areas. Today, the Liebherr Group comprises over 140 companies on all continents, employs more than 48,000 people and generated a consolidated total turnover of over 11.7 billion euros in 2019. Since its foundation in 1949 in Kirchdorf an der Iller in southern Germany, Liebherr has pursued the goal of convincing its customers with sophisticated solutions and contributing to technological progress.

**Krone – first choice for refrigerated semi-trailers**

Krone is one of the leading manufacturers of truck trailers and semi-trailers in Europe. The refrigerated semi-trailers from Krone provide the right answer to every transport task in temperature-controlled road transport. They stand for robustness down to the smallest detail and for maximum economy. A comprehensive, Europe-wide service partner network and close proximity to customers ensure the international success of the company.

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