



Flexible from -110 °C to -30 °C
Ultra-Low Temperature Store

 Made
 in
 Germany

Ultra-Low Temperature Store from -110°C to -30°C

The right temperature for your storage demand

Using air as refrigerant, KTI's Ultra-Low Temperature Store (ULT) is the most innovative product for storing vaccines, pharmaceuticals and other temperature-sensitive substances on the market.

It is a high-quality, flexible, mobile and reliable storage solution for vaccine manufacturers, pharmaceutical companies, logistics and distribution centers as well as for research institutes.

Due to its compact design in a CSC-certified 40 ft container, the ULT can be quickly and easily transported worldwide, installed and commissioned at a new location or as an extension to existing cold stores. On site, the ULT is ready for operation within a few hours after being connected to power and water supply - wherever and whenever it is needed.

With the ULT by KTI, temperature-sensitive substances can be stored at optimal temperature, ranging from -110°C to -30°C , using sustainable and efficient cold air cycle technology.

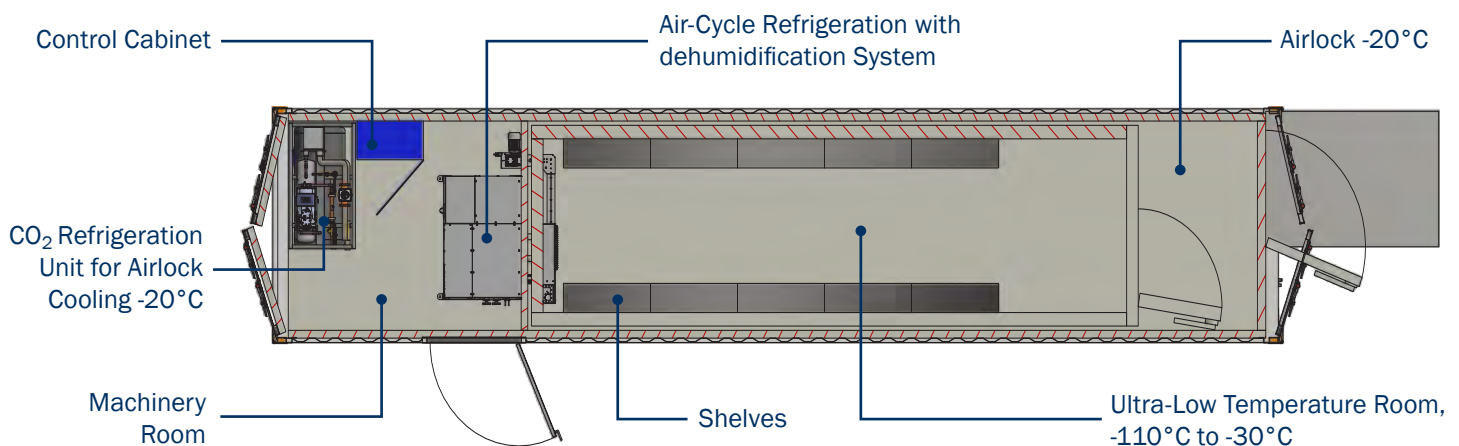


Ultra-Low Temperature Store - Exterior View



Storage Room

The „Box-In-Box“-Layout



The independent ultra-low temperature room is completely surrounded by -20°C cold air. An -20°C airlock prevents heat intake and dehumidifies the warm air.

Our Technology – Your Benefits



FUTURE-PROOF

We use exclusively natural refrigerants, namely air for the ULT chamber as well as CO₂ for the airlock zone.

This guarantees the use of our ULT solutions for decades, regardless of the phase-out of synthetic refrigerants.



RELIABLE

Innovative technology with only one compressor replaces complex cascade systems which depend on the simultaneous operation of several compressors.

Our technology is oil-free and wear-free thanks to its air bearing.



FLEXIBLE

Flexibly adjustable temperature from -110 °C to -30 °C, optimized for vaccine storage at -70 °C.

Thus, our ULT solutions are suitable for storing various substances at the required temperature with a flexible interior design.



EFFICIENT

High energy efficiency due to our two-chamber principle, which avoids a high infiltration of heat and humidity from the ambient air.

Our innovative air cycle refrigeration technology is most efficient at temperatures around -70 °C. Air as refrigerant is free of charge and therefore, our technology is highly cost-efficient in operation.



MOBILE

Our ULT store is Plug-&-Play, with an integrated machinery room for easy transportation and fast commissioning. No additional construction work is required.

With our CSC certified 40 ft container, our ULT store can be shipped worldwide.



AVAILABLE

Due to our compact design, a storage volume of 25 m³ is available, which can easily be added to existing storage facilities.

The robust and innovative technology guarantees a high availability at low maintenance efforts.

Refrigeration Technology at the Highest Level

Sustainable technology with all-natural refrigerants

The mobile ULT store uses an innovative, efficient and sustainable air cycle refrigeration technology. The refrigeration technology is based on the reversed Brayton cycle with air as the only refrigerant, at a maximum overpressure of less than 1 bar. Its core component is an oil-free compressor-expander unit that compresses and expands on the same shaft for energy recovery. Air as refrigerant is natural, available and free of charge, non-toxic, non-flammable and harmless to humans and the environment!

Operational safety through innovation

One of the most common causes of refrigeration system failure is compressor damage. The reasons include liquid refrigerant entering the compressor or insufficient lubrication due to lack of oil or poor oil quality. Furthermore, in cascade systems for low-temperature systems, multiple compressors must operate simultaneously, which increases the likelihood

of failure. Our technology has no phase change, no oil and is wear-free thanks to its air bearing. This guarantees the highest level of reliability.

Highest energy efficiency with smallest footprint

The KTI Ultra-Low Temperature Store uses an air cycle refrigeration machine. It draws in air with ice crystals and dirt from the inside of the ULT chamber, cleans the air with two redundant filters, cools it and finally blows the air back into the ULT chamber. This results in a very homogeneous temperature distribution. Based on extremely low temperature at the inlet, the dew point temperature is being reduced by up to 20 K. This means that the products are stored in a particularly dry environment.

The air cycle refrigeration machine is integrated into the cooled machinery room at the back of the storage container and connected to the filter unit on the inside of the ULT chamber. The air is drawn in from the ULT chamber and evenly distributed back into it by a distribution system. The inner Ultra-Low Temperature chamber can be accessed through an airlock, which is cooled to -20°C and serves as a buffer zone.



Ultra-Low Temperature Store - Front View



Machinery Room

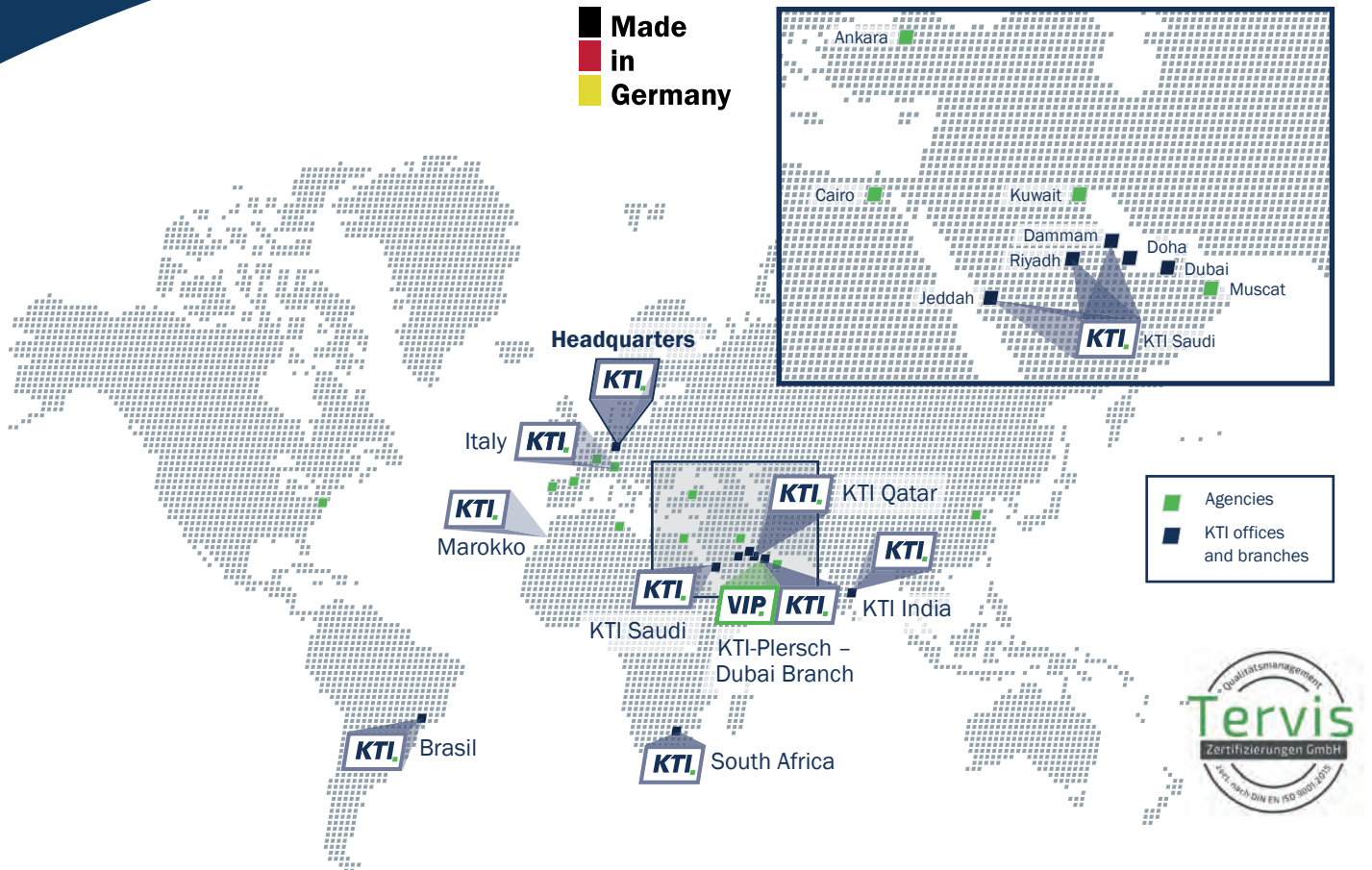
Technical Data

DETAILS OF PERFORMANCE AND DIMENSIONS	
External size (LxWxH)	12,192mm x 2,440mm x 2,900mm (without ramp)
Size ULT storage -70 °C (LxWxH)	7,160mm x 1,740mm x 1,994mm
Storage space ULT area	12 m ² (without lock zone)
Storage volume ULT area	25 m ³ (without lock zone)
Ambient temperature design	+45 °C
Power supply (without ext. chiller)	400V - 3 Ph/N/PE - 50Hz
Current (operating point whole system)	60A approx.
Electric power at operating point	9.1kW
ULTRA-LOW TEMPERATURE CHAMBER	
Refrigeration machine	MIRAI Cold 10
Refrigerant	Air
Temperature range	-110 °C to -30 °C; optimized for -70 °C
Refrigeration capacity	-60 °C 5.4kW
	-80 °C 4.3kW
	-90 °C 3.8kW
	-110 °C 2.7kW
COLD AIRLOCK	
Refrigeration compressor	Semi-hermetic piston compressor
Refrigerant	R744 (CO ₂)
Room temperature	-20 °C
Installed cooling capacity	6.1kW
Condensing unit	Water cooled condenser (external cooler 8 °C to 4 °C mandatory)
EXTERNAL GLYCOL COOLING UNIT *	MIRAI cold air system cooling
Refrigeration set	External refrigeration machine, air-cooled or water-cooled
Refrigerant	Any, e.g. R290, R1270, R134a etc.
Chilled water temperatures	8 °C to 4 °C
Required cooling capacity	30kW

*Not included in scope of delivery. Option available in customized versions.

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