

LU-VE: THE FIRST GAS COOLER FOR CO₂ TRANSCRITICAL APPLICATIONS

Since 1928, LU-VE Spa based in Uboldo near Milan in Italy has continued to be the leader in the development of heat exchanger components for air conditioning, refrigeration and heat recovery systems. LU-VE have developed and manufactured the Gas Cooler unit for the first refrigeration installation in the world to be completely fitted with a CO₂ transcritical cycle.

The LU-VE model **SHVDT 696 CO₂GC** was especially manufactured for Linde, a leader in Europe and one of the most important international manufacturers of refrigeration systems. The SHVDT 696 CO₂GC is working successfully at the Co-Op Tägipark supermarket located in Wettingen (Zurich, Switzerland).

The project is the first of its kind and has been studied and developed by **LU-VE S.p.A** in cooperation with the Linde laboratories Köln, Germany. It is the largest CO₂ transcritical installation in the world. The installation has high and low temperature refrigeration circuits (fresh and freezing cases plus cold rooms); and has a single circuit for high pressure side with the LU-VE's gas cooler cooling the compressed carbon dioxide at transcritical levels.

LU-VE's achievement is the result of a complex study developed in collaboration with the Politecnico of Milan using unusual solutions and technical choices for refrigeration application. The gas cooler design involves extreme working conditions which have never been applied before however LU-VE overcame the difficulties

SHVDT 696 – CO₂ Gas cooler technical features are as follows

- Rating 500 kW
- 12 fans - 800mm dia
- 7m length x 2.40m width x 2.25m height.
- refrigeration with CO₂ transcritical cycle;
- maximum working pressure 120 bar;
- CO₂ maximum temperature 150° C;
- Spray system (demineralised water) applied to the fins,
- CO₂ gas cooler exit temperature guaranteed (not higher than 30/35° C, summer conditions) and therefore with a high COP energy efficiency coefficient (cooling performance/electric power).

LU-VE S.p.A has been able to manufacture a product that many specialists thought was impossible to realize. The project has also been achieved due to LU-VE's ability to build upon their existing

technical innovations for the construction of high efficiency heat exchangers. In this particular case, **LU-VE's** technology has allowed the use of copper tubes with reduced diameter to be installed on the **SHVDT 696 – CO₂ gas cooler**. This characteristic is very important since an installation with a SHVDT 696 LU-VE has a minimum environmental impact due to CO₂ being used as refrigerant fluid. The gas cooler has strictly selected components qualified to obtain energy saving.

Environmental issues have always been a major consideration of the Co-Op supermarket group in Switzerland and in particular the use of environmentally efficient products within their estate.

Linde and the Swiss Coop chain are said to be very satisfied about the installation and the product supplied by **LU-VE**.

A new CO₂ gas cooler with 10 x 800 mm fans will be manufactured for an installation by Linde at one of the Migros Supermarket stores in the autumn.