



The DANFOSS OEM NEWS

March 2006

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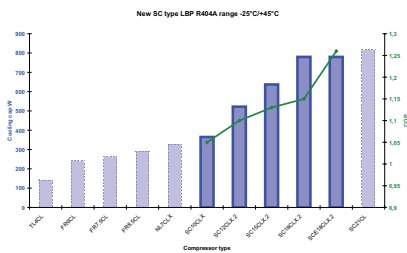
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DANFOSS COMPRESSORS: ENERGY OPTIMISED R404A COMPRESSOR FULL RANGE

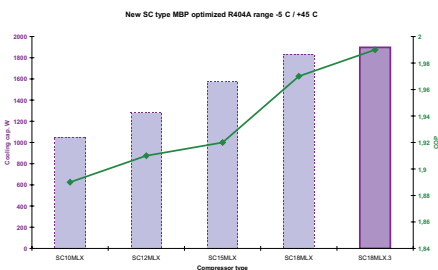
In order to complete its R404A compressor range, Danfoss Compressors presents its new models of energy optimised SC type compressors. On top of providing more cooling capacity at low and medium evaporating temperatures, this new range is optimised for the predominant applications in the market, enabling considerable energy savings, with small compressor dimensions and displacement.



The new SC type low evaporating temperature range consists of the models shown in dark blue in the graph.



The medium evaporating temperature SC type range is now completed with the SC18MLX.3.



BENEFITS OF THE NEW RANGE

- **Danfoss offers a full programme** of R404A compressors: for all types of applications: LBP / MBP / HBP.
- **Energy savings:** low operation costs due to a high COP optimisation.
- **Small compressor dimensions:** easy integration in compact cabinets.
- **Cost reduction at installation:** Light starting device (CSIR) for reduced installation efforts (SC10MLX / SC12MLX / SC15MLX / SC18CLX.2).
- **Stock flexibility:** versatile frequency 50-60 Hz (SC10CLX / SC12CLX / SC10MLX / SC12MLX).
- **Secure:** the wide voltage capabilities of the range makes it secure: it is non sensitive to unstable electric power.


FUTURE DEVELOPMENTS OF THE RANGE

Other developments of the R404A range will show up in the near future with higher cooling capacities in both MBP and LBP.



DANFOSS NEW PRODUCTS PRESENTED AT MOSTRA CONVEGNO EXPOCOMFORT



Danfoss has been participating lately in the 35th edition of MCE, in the new RHO exhibition area near Milan. The exhibition took place from February 28th to March 4th 2006. The Danfoss team was presenting the new or recently introduced products, focusing on environmental friendly news. 

- VTZ Compressor Drive™

The 7 new models of VTZ Compressor Drive™ utilise and combine our own in house design and manufacturing expertise. Our extensive application knowledge of refrigeration, air conditioning and motion controls ensure an optimised product design and package solution.



- **BD Direct current dual voltage compressors**, tailored for people in motion.

The Danfoss Direct Current Compressors range, leader in the market for more than 25 years with the BD35F and BD50F, is now extended with the new BD250GH for HBP applications and new models for other environmental friendly refrigerants.

- **New range of electronic thermostats, ETC1H and EKC 102-202-204**

Focusing on the customers' needs & applications, Danfoss has established a new generation of EKC and ETC electronic thermostats with smarter functions dedicated to small refrigeration applications.



- **Compressors for Propane**

The green alternative to HFC refrigerants. Danfoss has always been keen on taking care of the environment, and the full range of propane compressors is a demonstration of this commitment.



- **R410A compressor and controls**

In the European market the interest in R410A technology is growing more and more, particularly in heat pumps and air conditioning applications. Danfoss is able to fulfil this demand with a complete range of controls and compressors designed to work with R410A high pressure refrigerant.



- **ETS is a series of electrically operated expansion valves** for precise liquid injection in evaporators for air conditioning and refrigeration applications. These valves, thanks to their algorithm and the wide capacity regulation, are able to improve dramatically the energy efficiency of the unit.



- **Direct operated solenoid valves type EVU**, designed for being installed in very compact units, where small dimensions are a must.



- **Danfoss and Danfoss Saginomiya CO₂ controls**

You can rely on Danfoss & Danfoss Saginomiya as your partner for your CO₂ environmental friendly refrigeration units with the following range of products : HPV solenoid valves, CCB cartridge controls, JKV electronic expansion valves and the HSK pressure transmitter. Danfoss is also presenting the brand new DMT filter driers.



GRADE "A" PRODUCTION

Consistent quality satisfies customers and opens doors to new opportunities. The recipe is constant attention to quality throughout the production process. Hundreds of thousands of Danfoss Saginomiya's components with no errors was the result of ongoing inspections presented in a quality report earlier this year of Danfoss Saginomiya's deliveries to Daikin Europe, a leading Japanese supplier of commercial air conditioning equipment. "We are quite satisfied. Daikin is a demanding company and Danfoss Saginomiya is among our excellent suppliers", says Mr Stefaan Simpeleare, Department Manager, Procurement Department at Daikin.

Poka-yoke

Behind the result is an effort that focuses on quality from product design and assembly to when the product arrives on the customer's doorstep. By utilising a Japanese principle known as poka-yoke, every process is designed in a way which prevents defects. "Poka-yoke basically means errorproofing. We strive to design our parts and processes in such a way that human mistakes are impossible or at least easily detected and immediately corrected," says Mr. Hitoshi Shimomura, who has worked with quality management for more than 20 years. Much of the inspection is performed by the production staff who assemble the products. "We think about quality all the time and when customers are happy with our products it makes us feel proud," says Maria Kietlinska, who works as an operator in the Polish production.



Door opener

Being able to supply perfect products is a clear confidence booster. It is good for customers and good for business. "This is a result you normally only read about. Seen through Danfoss eyes this is an exceptional accomplishment, but it also proves that Saginomiya is an excellent partner for Danfoss. This kind of result strengthens both our reputations and brands," says Vice President Hans Viggaard, Danfoss Saginomiya. Consistent quality also opens doors to new opportunities as Daikin is considering inviting excellent suppliers to take part in Daikin's product development.



Facts

Danfoss Saginomiya supplies Daikin with:
_ Cartridge controls produced in Poland
_ 4-way reversing valves, stepper motor valves, check valves, solenoid valves from Saginomiya's factories in China and Japan





DANFOSS BI-METAL CONNECTIONS: FOR EFFICIENCY AND PROFITABILITY

At Danfoss, application engineers assist customers in proper design and maintenance of their systems. Danfoss has a history of innovation in valve technology dating to the company's origin in 1933. Today, Danfoss is the unique manufacturer in refrigeration and air conditioning area to propose bi-metal connection technology for efficiency and profitability of customers.

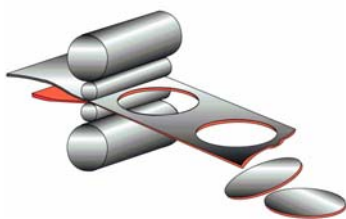


HISTORY OF BI-METAL CONNECTIONS

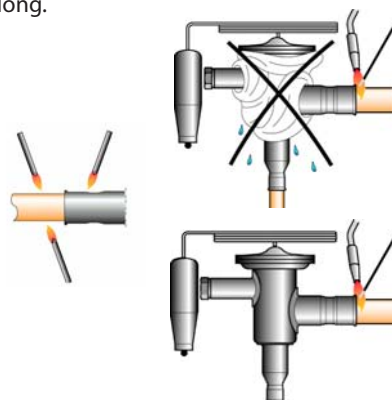
In 1997 Danfoss introduced the first stainless steel expansion valve. The TU valve was substantially lighter and much more compact than traditional brass-bodied expansion valves. Stainless steel had numerous advantages. It was easier to install in the often awkwardly placed small spaces where expansion valves have to fit. Lightness meant that the valve was not as subject to vibration damage. Since stainless steel cannot be brazed, Danfoss developed bi-metal connections for the TU valve.

PRINCIPLES AND BENEFITS OF BI-METAL CONNECTIONS

Rolling a sheet of stainless steel together with a sheet of copper under extremely high pressure until the metals fuse forms the connection bi-metal. The connections are seamlessly formed by another innovative process called deep drawing. Bi-metal connections have proved to make connecting valves faster, easier, and less costly for customers.



Brazing requires raising the temperature of the copper to the level where solder will melt. Traditionally, that required so much heat that mechanical means (large heat sinks or wet cloth wrappings) had to be used to keep the heat from being conducted to the precision parts inside the valve body. But since only the inner surface of a bi-metal connection is copper, and since stainless steel conducts heat much less readily than brass, the heat stays in the bi-metal connection. Much less heat input is required, and no external means has to be used to keep the heat in the connection, so the brazing process takes less than half as long.



COST COMPARISON OF SOLID COPPER CONNECTIONS AND BI-METAL CONNECTIONS

Even though care is taken to cool the valve body during brazing, about 1% of traditional expansion valves using solid copper connections suffer unseen damage during the brazing process and require field replacement. Manufacturers using Danfoss valves with bi-metal connections have reported a reduction from 1% field replacements to 0.03%. Since replacements in the field can cost as much as \$900, a manufacturer shipping, for example, 100,000 units per year can save \$873,000 by fitting them with Danfoss valves with bi-metal connections (\$ US - 2005 figures).

THE DANFOSS BI-METAL CONNECTION RANGE

With the industry's enthusiasm for bimetal connections on the TU expansion valve family, Danfoss has begun to offer bi-metal connections on larger brass-bodied expansion valves used in air-conditioning, and on a range of solenoid valves.

- TRE thermostatic expansion valve
- EVU solenoid valve
- AKS pressure transmitters

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