



## The DANFOSS OEM NEWS

October 2004

### Dear partner,

We are pleased to send you the first edition of our OEM dedicated newsletter. This newsletter will come to you twice a year. It is designed to give you news fitted for your business and your concerns: specific applications, products, refrigeration & air conditioning market and trends...

This Danfoss OEM News reflects our new sales organization implemented to have a better knowledge of you, your applications and your market at a European level. We deeply believe that the better we know your work, the better adapted our products and service will be.

We dedicate this specific issue to Danfoss R&D on the development of new environmental friendly refrigerants and also about the Danfoss products released for IKK 2004 in relation with your applications.

Enjoy reading those few lines!

### "Refrigerants, Naturally" Conference in Brussels June 22, 2004

## Danfoss Joins Forces with Coca-Cola, Unilever, and McDonald's to Provide Innovative Refrigeration Solutions

Danfoss joined with Coca-Cola, Unilever Ice Cream, and McDonald's at a major, one day conference in Brussels last June to discuss its involvement in developing alternative refrigeration technologies to Hydrofluorocarbon (HFC) refrigerants.

The hosting companies, joined by dignitaries together with governmental and non-governmental organizations, food and drink sector representatives, suppliers, retailers, technology providers and scientists demonstrated commitment to finding innovative and sustainable solutions for more environmentally friendly and efficient refrigerants.

Danfoss has a unique role as the innovative technology developer working with each of the hosting companies to provide alternative solutions. Danfoss presented two major, ongoing, projects. The first topic is the company's development of a solar-powered compressor using Hydrocarbon refrigerant used in coolers, the second is the development of a CO<sub>2</sub> compressor for use in vending machines and glass door merchandisers.

Global warming, ozone depletion and legislation are some of the key factors that affect

refrigerants used today and will continue to in the future. The Montreal Protocol made production of CFC illegal after 1995, and decided the HCFCs to be phased out in year 2015.

Before this trend, Danfoss has been putting considerable efforts into researching the use of CO<sub>2</sub> as a viable alternative refrigerant.

"Danfoss is an innovative technology leader committed to improving quality of life through environmentally friendly solutions," states Vagn Helberg, President of Danfoss Refrigeration and Air Conditioning.

Jorgen Stannow, Vice President for Research and Development at Danfoss, has been involved with the development of CO<sub>2</sub> and worked closely together with Coca-Cola remarked "There has been a great deal of interest in CO<sub>2</sub> globally. Where there is interest, Danfoss will innovate. We want to provide our



customers and the industry with refrigerant solutions today, tomorrow, and beyond."

Danfoss laboratories solved the problems of the very high pressure CO<sub>2</sub> refrigeration cycle, and today on a pre-series basis Danfoss has designed a compressor and controls which can operate up to 130 bar with CO<sub>2</sub> as a refrigerant. There has been considerable interest in the Danfoss type TN compressor, designed and built specifically for CO<sub>2</sub> applications (shown at IKK 2003). With Danfoss CO<sub>2</sub> compressors, Danfoss has successfully proven a technology and looks to the future for further development.

The dynamics of the market are changing. CO<sub>2</sub> has spurred interest. And where there is interest, Danfoss innovates.

Danfoss & IKK 2004

# Danfoss Commercial Compressors (DCC) has been working on the development of new high technology refrigeration compressors: the result is here on IKK 2004!

## New refrigeration Scroll compressors Speerall™



Danfoss Commercial Compressors is introducing to the refrigeration market the new and innovative MFZ & LFZ Speerall™ scroll compressors, designed for R404A-R507A refrigeration applications.

With a wide evaporating temperature range (-30 °C to +5 °C) the MFZ compressor is an excellent choice in medium temperature applications for power-packs, food processing and cold storage installations.

Low evaporating temperature needs (-45 °C to -15 °C) are covered by the LFZ series. An electronically controlled injection kit is used to maintain optimum discharge temperature under all operating conditions.

Both MFZ and LFZ Speerall™ compressors have the design and construction features required for parallel mounting in rack assemblies for large cooling capacity systems.

The most striking features of this new range are:

- Large possibility of applications thanks to a wide evaporating temperature range (-45 °C to + 5 °C)
- High energy efficiency
- Easy integration in racks
- Highly reliable and protected
- Easy to install and maintain



### Medium temperature application

#### MF series

Model	Displacement (cm <sup>3</sup> )	Cooling cap. (Watt)	Power Input (Watt)	CCP (VWW)
MFZ 166	166.6	18 000	8 100	2.23
MFZ 250	249.9	27 000	12 100	2.23

-10/+45°C / RGT 20°C / SC=0K / 50 Hz / R404A/R507A

### Low temperature application

#### LF series

Model	Displacement (cm <sup>3</sup> )	Cooling cap. (Watt)	Power Input (Watt)	CCP (VWW)
LFZ 166	166.6	6 600	5 700	1.16
LFZ 250	249.9	9 910	8 550	1.16

-35/+40°C / RGT 20°C / SC=0K / 50 Hz / R404A/R507A

### R404A Low temperature applications

## NTZ, the best in its class for efficiency!

The new NTZ series reciprocating compressors has an extended evaporating temperature range from -10 °C down to -45 °C. Thus offering a very wide application range and improved temperature pull-down capabilities.

#### Energy saving and high performance

NTZ has been engineered and optimised at -35 °C, ensuring the best performance and high energy efficiency where you need it most; at low evaporating temperatures!

#### Simple, reliable & straightforward compact product

The compact NTZ compressor can be integrated easily into many systems where alternatives

won't fit. It accepts a return gas temperature up to 20 °C without special adaptation. The suction gas cooled motor in combination with the integrated motor protection allows for many years of reliable operation.

NTZ, the widest hermetic low temperature range is tailored for walk-in freezers, frozen food processing and storage, low temperature racks, display cabinets, etc....



NTZ New models	NTZ Cooling Capacity in W
NTZ 048	930
NTZ 068	1650
NTZ 096	2010
NTZ 108	2050
NTZ 136	3270
NTZ 215	4930
NTZ 271	7000

-35/+40°C - RGT 20°C - SC0K - R404A/R507A

Variable cooling needs? Our answer: Variable speed compressors VTZ + AKD

## Frequency converters for superior efficiency solutions

Most cooling systems operate with extremely large fluctuation of load. Conventional installations become oversized for extended period of time leading to imprecise control of temperature and more importantly to loss of energy.



The package solution developed by Danfoss using the new VTZ reciprocating compressor together with the AKD frequency converter offers unmatched efficiency level and a precise

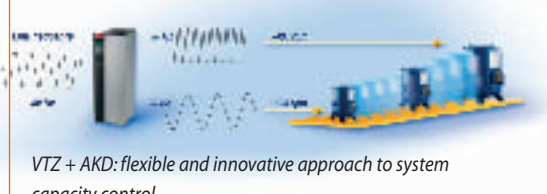
control of the capacity, eliminating temperature overshoot.

The system capacity becomes perfectly synchronized with the actual load by continuously adapting compressor speed, limiting on/off cycles to a minimum, improving cooling process control accuracy.

In a vast variety of commercial refrigeration and industrial process cooling applications the Danfoss variable capacity solution is delivering:

- great opportunities for saving energy

- improved process control accuracy
- reduced cycling for greater reliability
- extended capabilities for system control and safety thanks to the built-in features of the AKD converter



VTZ + AKD: flexible and innovative approach to system capacity control

## Household compressors news

Food and Beverages / Dispensers / Milk cooling / Industrial process

### Hot news : Danfoss compressors closes the gap

Danfoss Compressors is developing a new compressor range GS/GT that will expand the existing compressor range and will offer a higher cooling capacity. The bridge is now being made between the black and blue compressor ranges from Danfoss.

The product program plans compressors with 21 to 34 cm<sup>3</sup> displacement, designed for refrigerant R404A and R134a. The preliminary capacities of those compressors will range from 1980 W to 3220 W at -5 °C evaporating temperature (MBP application - R404A).

Soon available in one and three phase motor, this new compressor range will fit perfectly various applications like:

- glass door merchandisers
- ice cream cabinets

- ice making machines
- milk cooling
- liquid chilling process
- compressor air driers
- equipment for laboratory etc...

The dimensions of the compressors are optimized for easy integration and servicing.

- **High COP & energy savings**
- **High cooling capacity**
- **Compactness**
- **Low sound level**

will be a brand mark to **this new range of compressors**. More than 50 years experience guarantees high quality and knowledge in compressor technology and applications.



Hotel mini bars

### Who is whispering in your hotel room?

Compressor type PL : the right solution for use in mini bars

Danfoss Compressors offers a **solution** in the mini bar technology with the compressor type PL.

Refrigeration systems using reciprocating compressors PL have lower thermal (heat) radiation in comparison with the standard absorption system, meaning no additional costs to cool the room down.

The product range consists of three different

compressor sizes between 50 and 100 W cooling capacity at -10 °C evaporation. These compressors are designed for R134a.

The most striking characteristics of the PL compressors are the following:

- **Low noise level**
- **Small in dimensions**
- **Light-weight**
- **Low heat radiation & low energy consumption**



## Refrigeration and air conditioning controls

### Residential heat pumps & small commercial refrigeration units

## Softer the starting, longer the living: New MCI CH soft starter

Danfoss is now introducing the first soft starter in the world especially designed for small commercial refrigeration units & heat pumps for residential use: MCI CH.

The MCI CH soft starter reduces **from 40 to 50 % the compressor inrush current** where maximum electricity peaks must not be exceeded (local standards for residential applications/weak electricity network supply...)

#### Savings:

- Smaller inrush current enables a **cheaper** dimensioning of main fuses and therefore lower fees paid to the electricity company.

#### Tailor made for residential applications:

- Low permanent electromagnetic emission.
- Fulfils the electromagnetic compatibility requirements of EN 60947-4-2 to be used on public electrical networks.
- Wide temperature range (-20 °C + 40 °C) which allows MCI CH to be used outside (E.g. heat pumps applications).



### Power packs, racks & air conditioning, applications

## The new generation of DCR filter driers Eliminator® for high working pressures!

Danfoss introduces a new generation of DCR Eliminator® filter driers with replaceable solid cores. Besides being able to meet even the most demanding requirements, such as high working pressure levels (up to 46 bar) when using R410A or CO<sub>2</sub>, this new range also opens up a world of opportunities through the many combination possibilities giving you the right solution for your power packs, racks and air conditioning applications.



#### Strong, reliable, high pressure resistant

The filter housing and the core holder are made from steel. Danfoss uses the latest manufacturing techniques, where every DCR undergoes a number of thorough test procedures in accordance with the strictest standards (e.g. a helium leak test) during the production process.

The surface of the filter housing is treated with zinc phosphate to protect it against corrosion. The 'finishing touch' is a corrosion-resistant powder coating.

#### Tailor made & flexible solution

- The filter housing and drier core are easily assembled and **so can be custom sized to suit the application.**
- The filter housings are available in 1, 2, 3 and 4 core options offering **a wide range drying capacity.**
- The connection options are 5/8" to 2 1/8" solder and 1/2" to 2" weld.
- There are two end plate options: blank plate or plate with service port.
- Danfoss is the **only** manufacturer to provide special versions for a maximum working pressure of 46 bar.