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Danfoss-Turbocor High-Efficiency Compressor Joint Venture

Denmark-based Danfoss A/S and Montreal-based Turbocor Inc. last month announced the formation of a 50/50 joint venture to be named Danfoss Turbocor Compressors Inc. (as reported briefly in the July issue of JARN). The new company was formed with Turbocor's existing product line of oil-free centrifugal refrigerant compressors, its growing worldwide customer base and its manufacturing facility in Montreal. Mr. Joe Orosz, President of Danfoss Commercial Compressors Ltd., Lawrenceville, Georgia, has been appointed President of the new company.



Mr. Joe Orosz, President of Danfoss Turbocor Compressors Inc.

The key to this transaction is the growing international support for Turbocor's new oil-free commercial compressor range, which uniquely combines magnetic bearings, a direct-drive permanent-magnet motor, variable-speed drive, 2-stage centrifugal compression and fully-digital integrated electronics. Turbocor's oil-free centrifugal compressors routinely deliver IPLV energy savings of 30-40%, and operate very quietly (70 dBA at 1m).



Two Turbocor compressors mounted on Climaveneta chiller

"This compressor will set an industry standard and provide the HVAC mid-market with the most innovative and attractive product offering for many years to come," said Mr. Guillermo Diaz Trillo, President of the Commercial Compressors Division of Danfoss and a member of the board of Danfoss Turbocor Compressors Inc. "Turbocor's cutting-edge products using advanced technologies, combined with Danfoss' industry leading manufacturing technology, marketing expertise and extensive sales network will strengthen our global position and add value for our customers worldwide."

Turbocor co-founder Roger Richmond-Smith said: "The whole team is delighted with the deal, because it means the technology is here to stay. With a far-sighted global major company like Danfoss as our strategic partner, we can now comfortably support rapid growth in

manufacturing, in new product platforms and in field service depth. The Turbocor technology has been hailed as a breakthrough with major business potential."

Danfoss Turbocor serves HVACR original equipment manufacturers (OEMs) and retrofit applications using the Turbocor family of compressors. The company has so far supplied many Turbocor oil-free compressors to OEMs such as Climaveneta, Electra, McQuay, Multistack, PowerPax (Australia), RC Group and so forth.

"The Danfoss Turbocor compressor now is installed in hundreds of installations around the world. Collectively, we have over 1,000,000 field-run time hours with, statically, an up time of 99%. Our production rates in 2004 will be 4 to 6 times that of 2003. In 2005 we expect to

see an additional growth of 3 to 4 times. This explosive growth is driven by the high efficiency, oil-free, extraordinarily quite, light weight nature of this truly amazing technology." said Mr. Eugene Smithart, V.P., Sales and Marketing, Danfoss Turbocor Compressors Inc.

Danfoss Turbocor Compressors Inc. provides the HVAC market with high-efficiency centrifugal compressors. The company currently produces 60-90 ton compressors for R134a refrigerant. The product line uses oil-free magnetic bearings and minimizes lifetime operating costs in air conditioning's central plant mid-market (60-500 tons). Formation of the joint venture enables Danfoss to expand its commercial compressor product line to include high-efficiency oil-free centrifugals, and Turbocor access to Danfoss' strong worldwide sales and service network.

Danfoss' commercial product line includes mainly scroll compressors from 7 up to 50 tons (tandem type) at max. Turbocor products converging 60-500 ton range will greatly contribute to Danfoss' compressor business.

[Continued on Page 6]

Matsushita Celebrates World's First 50 Millionth AC Compressor in Malaysia

On July 12, MCM (Matsushita Compressor and Motor Sdn. Bhd.) held a ceremony celebrating that their cumulative production of air condi-

tioner (AC) compressors has reached 50 million units. The 50 millionth unit was attained by a single factory for the first time in the world.

[Continued on Page 28]

European Press Review

News, markets and technical developments in the acr industries as reported in the European media

Edited by Alan Field, FCIBSE MIL, England



Italian ac market update

The manufacturers' association ANIMA-CoAer in their latest survey of member firms show meteoric growth in the market for moveable and split air room conditioners in Italy in the period 2002/2003. From 134 000 units in 2002, the market for moveables rose to 197 000 in 2003 and sales of splits from 930 000 to 1.36 million units. If non-member firms are taken into account the market for 2003 is estimated to be around 220 000 for moveables in a total production of 360 000 (140 000 for export). Chinese suppliers are becoming prominent in the single splits sector and sales in southern Italy have surged: ANIMA-CoAer estimates that the true figure for the market in 2003 could be as high as 2 million units.

The splits industry is highly fragmented - over 120 brands were present at the Mostra Convegno exhibition in Milan in 2004. This is a fiercely competitive market with constant downward pressure on selling prices caused by low-cost Chinese imports. In the last 12 months the average price for single splits has fallen by over 15% and multi-splits by over 25%.

The very hot summers which Italy has experienced for the last two years combined with the increasing replacement market for ac units installed in the 80s and early 90s will guarantee growth.

Italy is the largest ac market in the EU at 25% of the total and is the leading ac equipment producer at 30%.

Source: Eurovent-Cecomaf Review, Belgium

Desiccant cooling system

An experimental desiccant cooling system developed at the University of Nottingham (UK) uses a so-called 'mop' fan - a centrifugal impeller made up of radial polyester fibres - which acts as a combined air mover and heat/mass transfer medium. In the prototype assembly tested there were three fans: liquid desiccant (potassium formate) is sprayed into the impeller of the first fan and the dry heated air stream is subsequently cooled by spraying water into the second fan on the circuit which delivers the cooled supply air to the room. The third fan extracts the room air and spray-cools it, transferring heat from the supply air via a heat-pipe heat exchanger.

The mop fan also functions as a filter and is said to have an efficiency of 99% for particles in the range 0.5 to 10 microns.

Source: Ambient Energy, UK

Sanitising ducted air systems

A technique of diffusing molecules of aromatic substances produced by plants (essential oils) into ducted air systems has been developed by Laboratoire Air Pharma in France. The oils inhibit the formation of micro-organisms and have no negative impact on the health of the building's occupants. Different combinations of oils are used depending on the kind of building.

The oils are introduced into the air stream via a venturi nozzle driven by compressed air. The resultant cloud of sub-micron particles is said to be completely 'dry' and does not cause condensation on surfaces or within air filters. The effectiveness of the system has been independently assessed and the company is awaiting 'Agrément' certification. A French standard (Afnor) will be issued in 2005.

Source: CLIM Pratique, France

LG in Spain

Spain is the second largest ac market in Europe with over one million users. The air conditioning division of Korean electronics giant LG currently ranks in the top ten suppliers of single splits although their presence in Spain's ac sector is comparatively recent. In an interview with Clima Noticias magazine, LG said that volume sales (numbers of units) had risen by 43% in the period 2002/2003 making a value of 60 million euro in 2003. Sales in 2004 are expected to rise to 75 million euro.

LG emphasises quality and good design as its main selling points. The company has already set up an air conditioning academy (training centre) for specifiers and service engineers.

Source: Clima Noticias, Spain

Heat wave shelters

In the summer of 2003 several thousand people in France, mostly elderly, died from the effects of the pro-

longed heat wave. In May this year the government launched its heat wave plan and in June distributed some 3 million copies of a guidance brochure to pharmacies and national health centres. One of the recommendations for nursing homes and retirement homes is to provide a climatic 'shelter' - an air conditioned room or rooms - where the temperature is held at 25 C up to outside temperatures of 32 C and humidity is in the range 30 and 60% RH.

Up to July this year it is estimated that around 40% of the 7700 retirement homes have either been equipped with air conditioning or have ordered the equipment. In many cases the solution has been to buy moveable units.

Source: CLIM Pratique, France

Steel prices hit German ac industry

Increases of up to 50% in the price of steel combined with widespread supply shortages are hitting the German ac industries. A survey by CCI magazine found few firms able to absorb the impact on final equipment selling prices: for example, Wolf, leading manufacturer of air handling units mentioned possible increases up to 4% and Klingenberg who make heat recovery wheels said that having to source high price steel would affect 80% of turnover.

Source: CCI, Germany

Swing to natural refrigerants.

With even the medium-term future of HFCs in doubt some users and specifiers are already turning to the low and zero emission alternatives ammonia, hydrocarbons (HCs) and CO₂. At a forum on natural refrigerants in Brussels, three international names in the food industry - Unilever, McDonalds and Coca-Cola - announced they were switching to natural refrigerants. Klima-Therm (UK) recently installed six 1 MW ammonia chillers for a London office block.

Source: AC&R News, UK

Sources

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U.S. Factory Shipments : May 2004

Item	This month		Year to Date	
	Quantity units	Comp.(%)	Quantity units	Comp.(%)
Room AC (Window type)	1,745,200	135.1	5,810,200	93.2
Unitary AC (including Heat Pumps)	898,333	118.0	3,254,240	111.4

Source: AHAM: Association of Home Appliance Manufacturers
ARI: Air-Conditioning and Refrigeration Institute

MARKET NEWS

AGRAMKOW Opens New Sales and Service Center in Shanghai

To better serve customers in the fast growing Chinese market, AGRAMKOW Fluid Systems A/S has opened the doors to its new Sales and Service Center in Shanghai. The office officially opened on 29 June.

China represents an exciting opportunity for AGRAMKOW. "We will open our office with a sufficient staff of sales and service employees," says Vice President Hans Jørn Petersen. AGRAMKOW already has the biggest installed base of charging and test equipment in China, and the company has been operating in the country for more than 10 years. Until now AGRAMKOW has sold systems through agents and partners on the Chinese market. "We have been very satisfied with our distribution set-up in China, and we will proceed with our cooperation in several areas" says Mr. Petersen. "However, it is time for AGRAMKOW to be present locally with our own dedicated China organization, in order to get closer to the main players in the appliance manufacturing industries."

AGRAMKOW's investment in China compliments its international strategy. The company already has its sales and service subsidiaries in Singapore, the UK and Brazil as well as service centers in the Philippines and India. AGRAMKOW is also represented by alliance partners in over 20 other countries around the world.

About AGRAMKOW

AGRAMKOW designs, develops and markets charging systems, test systems and production line information systems that are deployed in leading manufacturing facilities around the world. AGRAMKOW has continually pioneered the development of new capabilities in response to the rapidly changing needs of the refrigeration appliance and air conditioning industries.

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Carel Offers ir33: the New Generation Controllers for Refrigeration

Following ir32, one of CAREL's most famous and best selling controllers, the new ir33 is now available.

The top-of-the-range model characterizing the new series arouses special interest as it can be fitted with all the options available: infrared remote control, programming key, repeater display, high efficiency LED display, HACCP function, real time clock, RS485 serial port, second evaporator defrost management, without sacrificing the 4 control relays and the 115 to 230 Vac switching power

supply. All obviously in the same dimensions as the current ir32 case!

Another unique feature concerning this new series of controllers is the possibility to manage smart defrosts, optimizing the management of this function, with consequent energy savings.

Finally, one very important aspect involves the IP65 index of protection; the modern technology implemented by CAREL for the moulding of the plastic parts has allowed the protection gasket to be integrated directly into the front panel, without the need to add accessory components to the product that may create an unpleasant aesthetic and visual impact.

ir33 is not only a range of panel mounting instruments: at the next IKK - Hall 6, booth No. 106 - CAREL will introduce the new range of DIN rail mounting instruments thus offering interesting solutions and remarkable advantages for the electrical panel market.



Carel New Refrigeration Controller "ir33"

Melco Mini-Split Awarded by U.S. Journal

The first Dealer Design Award was announced in *The Air Conditioning, Heating & Refrigeration News*, the leading trade magazine in the USA. In the HVAC Equipment-Commercial category of the Award Program, Mitsubishi Electric Corp.'s (Melco's) Mr. Slim Mini-Split air conditioner & heat pump became the Bronze Winner.

This may be an indication of ductless split systems being gradually recognized in the US market too. Although ductless split systems, which are called mini-split systems in the USA are increasing their share in the world markets other than the USA as important equipment, their shipments to the US are estimated at 100,000 ~ 150,000 units only, thus being negligible in the American room air conditioner/unitary air conditioner market which is sized at around 13 million units. In recent years, however, mainly the Asian makers are powerfully exploring the market, and it is expected for dealers, contractors and end users to deepen their understanding of ductless split systems.



The Mini-split "Mr. Slim" Mitsubishi Electric and Electronics USA Inc. offers

Quoted below is an article on Melco's Mr. Slim which has become the Bronze Winner.

Bronze Winner

The Mr. Slim split A/C or heat pump unit requires no ductwork, so the installer can place the indoor unit within the re-

quired zone using basic tools, said Mike Smith, marketing manager, Mitsubishi Electric and Electronics USA Inc.

According to Smith, the short steps include the installer finding the best location for airflow circulation, which can be in areas of space that are less visible; drilling a 3-inch-diameter hole to the outside; mounting the wall bracket (provided); feeding the utilities through the wall to the outside; and hanging the unit securely onto the bracket.

"He locates an area for the outdoor unit and sets the unit on a concrete pad for stability," said Smith. "He then connects the indoor unit to the outdoor unit with refrigerant piping and control wiring. He has to find a power supply for both indoor and outdoor units. Because this system is wireless, he does not have to worry with control wiring from the outdoor unit a wall-mounted thermostat, which saves additional time. After four to six hours, he can complete the installation, which means minimal disruption to the home or business."

Model PKGH36FL, a "wall-mounted, 3-ton model, is typically offered in a commercial category and is perfect for retrofit or remodeling applications such as schools, colleges, and universities; hospitals and nursing homes; offices; churches; computer network rooms; and more," said Smith.

Many of *The News'* contractor-judges did not at first consider a ductless unit fit for a commercial application. However, after reviewing the material supplied by Mitsubishi Electric and Electronics USA, many came away with a different outlook concerning commercial ductless A/C and/or heating.

"Because this system is ductless, the installer and service technician do not have to sweat in attics dealing with a central air handler or crawl under buildings to deal with ductwork," said Smith.

York Announces 2nd QR Results and Comments on Business Outlook

York International Corporation reported net income of \$38.4 million, or \$0.91 per share for the second quarter of 2004.

Sales increased 12.7% from the second quarter of 2003 to \$1.2 billion due to strong increases in UPG and in all geographies within Global Applied. Income from operations was \$48.4 million in the second quarter of 2004, highlighted by a 26% improvement at UPG and a 16% improvement at Global Applied.

[Continued from Page 1]

Danfoss -TurboCor J.V.

Danfoss TurboCor Compressors, Inc. has named Mr. Joe Orosz its inaugural President, succeeding Mr. Brian T. Evans Sr., outgoing President & CEO of TurboCor Inc. Mr. Orosz brings with him many years of senior experience in compressor design, engineering and manufacturing. His most recent assignment was as President of Danfoss Compressors, Inc. in Atlanta, Georgia, a start-up operation he launched in 1999 and which now ships 70,000 compressors annually.

Business Unit Review

• Global Applied

Revenue for the Global Applied business was up 13.7% from the second quarter of 2003 to \$883 million. Revenue in the Americas was up 8.7% due to improved equipment volume and continued service growth. Revenues increased 14.5% in EMEA driven by strong sales growth and the favorable translation impact of European currencies. Asia revenues increased 23.9% with growth in every country. Revenue from the service businesses improved 8.1% as compared to the second quarter of 2003.

Income from operations improved 16.1% to \$60.0 million as compared to \$51.7 million in the second quarter of 2003. Higher volume and benefits from restructuring actions in 2003 were partially offset by higher material costs, pricing pressure, and investments in IT and product development.

• Unitary Products

UPG sales were up 15.8% to \$258 million as compared to \$223 million in the second quarter of 2003, with sales gains in every product category.

Income from operations in the second quarter improved 25.5% to \$30.2 million versus \$24.0 million in the second quarter of 2003. Improvements in production efficiency, a more positive product mix, prices increases and operating leverage on higher volume more than offset material cost increases.

• Bristol

Bristol's sales for the second quarter were flat with last year at \$139 million. Increases in sales to international customers were offset by lower sales to domestic customers.

Bristol's income from operations was \$4.2 million as compared to \$11.9 million in the second quarter of 2003, primarily due to rising material costs and the replacement of domestic volume with lower priced applications for international customers.

Outlook

Mr. C. David Myers, President and CEO of York Int'l, said,

"We are optimistic about market conditions. Overall Global Applied markets are showing signs of improvement for smaller sized applications and quoting activity is strong. The impact of the market strength is reflected in our backlog increase of 16.2%. Increased order levels in UPG continued in early July, driven by a strong market and acceptance of our new products."

Under Mr. Brian Evans' leadership, TurboCor moved from an R&D focus to global commercialization of the TurboCor high-efficiency compressor technology. During his tenure at the top, TurboCor won a number of very prestigious awards, including the U.S. EPA's Climate Protection Award, the 2003 AHR Expo Energy Innovation Award, and the 2003 Canadian Energy Efficiency Award - Equipment Category. Mr. Evans also extended the TurboCor product line and developed a strong business base, not only in North America but also in Europe and the West Pacific, which will undoubtedly serve the joint venture company for some time to come.