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BITZER sets the bar for sustainability and energy efficiency in HVAC&R

Milano/Sindelfingen, 28.02.2024. The main challenge of the future will be to raise HVAC&R systems to an even more eco-friendly and energy-efficient level. BITZER will showcase its latest solutions on these topics at Mostra Convegno Expocomfort at Fiera Milano, Pavilion 11, Stand C31/D42, from 12 to 15 March 2024.

Energy-efficient systems for natural refrigerants are currently an urgent topic in the entire industry. BITZER can boast extensive experience in natural refrigerants with proven technology gained over years and remains dedicated to advancing its expertise in this direction. At this year's Mostra Convegno Expocomfort, the specialist for refrigeration, air conditioning and heat pump technology will set a major focus on presenting its energy-efficient broad portfolio for R290 (propane) and R744 (CO₂). For example, the new ECOLINE 8-cylinder reciprocating compressor series for transcritical CO₂ applications is up to 10 percent more energy-efficient than conventional 6-cylinder compressors on the market.

BITZER portfolio for R290 (propane) for heating and cooling

BITZER has a long history of expertise in products for R290 (propane) and it is the only company offering a comprehensive compressor portfolio for this refrigerant – including reciprocating, screw and scroll compressors. Whether for heat pumps, air conditioning or process and IT cooling, the new ORBIT PRO scroll compressors open a wide range of sustainable applications. BITZER is expanding its ORBIT scroll compressor series with a version specially designed for the future-proof refrigerant R290 (propane). With evaporation temperatures between –30°C and 30°C and condensing temperatures between 10°C and 80°C, the compressors are therefore also suitable for the combined use in systems

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for reversible heat pumps. The ORBIT PRO series delivers a cooling capacity of between 16 and 64 kW* and a heating capacity of between 21 and 82 kW* and is available in displacements between 19.8 and 77.2 m³/h at 50 Hz (* standard reference conditions SST +5°C / SDT 50°C / 50 Hz).

Reciprocating compressors of BITZER are also specially adapted to operate with R290 (propane). The BITZER ECOLINE P series can be used in a wide range of applications and is designed to achieve a high level of energy efficiency and low operating costs. This is accomplished through features such as optimised working valves' configuration and internal gas flow as well as the combination with the mechanical capacity control VARISTEP for high efficiency at both full and part load, or the variable speed control with the frequency inverters VARIPACK.

Furthermore, BITZER will introduce its redesigned CSHP compact screw compressor series at this year's Mostra Convegno Expocomfort. Specially developed for eco-friendly system operation with propane (R290) and isobutane (R600a), the CSHP series features expanded application limits to meet all requirements of sustainable installations. Equipped with an integrated oil separator and built-in suction gas-cooled motor, they are suitable for compact comfort and process cooling as well as heat pump systems. Ex-works, the compressors come with the SE-i1 protection device, offering comprehensive protection, and simplifying commissioning and servicing. For R290, CSHP compressors are available with a displacement from 197 to 910 m³/h at 50 Hz with options for mechanical capacity control and VSD operation. For R600a, displacements ranging from 197 to 1,120 m³/h at 50 Hz are provided. External frequency inverter operation is also possible. Additionally, pressure vessels and heat exchangers are available.

Natural refrigerants: general information and practical training for safe utilisation

In January, the European Parliament and the European Council agreed on stricter regulations on the use of fluorinated gases (F-gases) and ozone-depleting substances (ODS). The accelerated HFC phase-down and extended use bans also pose challenges for the refrigeration, air conditioning and heat pump industry. Only refrigerants with minimal global warming potential (GWP) and little to no environmentally harmful degradation products will be future-proof in the long term.

The application of natural refrigerants requires special safety measures and thus profound training to ensure safe operation and qualified maintenance. R290 (propane) and other hydrocarbon refrigerants are highly flammable whilst R744 (CO₂) operates with very high system pressures. BITZER provides information to enable an in-depth understanding of refrigerants in general and how to use them – for

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example, in the [Refrigerant Report](#) – and practical training courses at the [SCHAUFLEER Academy, the international training centre of the company](#).

Optimising compressor operation: IQ MODULE and other electronic components

The IQ MODULE simplifies and optimises compressor installation, operation, maintenance and retrofitting. This results not only in time and cost savings for the system operator, the installer and the planner, but also offers a new world for operating the installed compressor accessories as well as new digital services. All reciprocating compressors of the C3 to C8 series manufactured at the Schkeuditz factory, Germany, come with the new generation of the IQ MODULE CM-RC-02. In addition to monitoring the compressor's key operating parameters, the IQ MODULE can also operate compressor motor protection and the oil heater and keep an eye on the discharge gas temperature and oil supply. The high pressure switch can be connected directly to the compressor module. The IQ MODULE CM-RC-02 simply requires the switch signal from the superior system controller to activate the compressor. Additional functions included in the optional range of services for BITZER reciprocating compressors – for example, capacity control, oil level monitoring and control, and liquid injection – can be electrically connected to the IQ MODULE, which not only simplifies switch cabinet wiring, but also reduces the number of control outputs required.

There will be three optional extension boards for the IQ MODULE CM-RC-02 to choose from, each with different features. With the IQ MODULE, the components selected in conjunction with the compressor can be ordered already wired, configured and tested by BITZER, which simplifies compressor installation in the system and drastically reduces the amount of time necessary for production, troubleshooting and commissioning.

Optimising especially heat pump and air handling unit (AHU) operations through advanced electronic control algorithms is a pivotal factor in achieving a higher seasonal coefficient of performance (SEER and SCOP). A testament to the commitment to advancing intelligent solutions of BITZER is the integration of [OJ Electronics](#) into the BITZER Group. This strategic collaboration significantly amplifies the impact and possibilities within the AHU and ventilation sector, resulting in an expanded product portfolio.

Visit the OJ Electronics booth at Mostra Convegno Expocomfort pavilion 11, C45, D48 or go to the website at www.ojelectronics.com.

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Sustainability at BITZER

Sustainability is a global task for BITZER and its goal is to reach CO₂ neutrality in 2030 at three of four German company locations. The locations can already generate up to 90 percent of the electricity they need each year using a mix of different energy sources.

BITZER can look back on more than 20 years of successful EMAS certification in the field of environmental management. EMAS, the Eco-Management and Audit Scheme, is a European environmental certification that examines corporate contribution to environmental protection and social responsibility. The structure of the environmental management system in EMAS corresponds to the environmental management standard ISO 14001. In addition, the headquarters of BITZER in Sindelfingen, Germany, has been EcoVadis-certified since 2022 which formalises and externalises its commitment, activities, and projects in the areas of sustainability and CSR. EcoVadis is one of the world's largest rating and certification providers for sustainability and corporate responsibility.

Further information on the company's commitment to sustainability is available on the BITZER website: [Responsibility at BITZER](#).



As an independent specialist for refrigeration, air conditioning and heat pump technology, BITZER is present all over the world: with products and services for refrigeration, air conditioning and process cooling as well as transport, BITZER ensures optimum temperature conditions for trade in goods, industry processes and indoor climate control – always striving for the highest possible energy efficiency and quality. BITZER is represented all over the world with 75 sites in 40 countries, including its sales companies and production facilities. Trade and service partners included, the BITZER network of manufacturing, development and sales extends to almost all countries around the world. In 2022, more than 4,000 employees generated a turnover of €983 million; expenditure for research and development totalled €53 million.

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Image 1: Expands the ORBIT scroll compressor series from BITZER: the new ORBIT PRO for propane as a refrigerant



Image 2: BITZER IQ MODULE CM-RC-02 for ECOLINE reciprocating compressors