



Emerson R290 Solutions for Commercial Refrigeration Applications

Emerson R290 Solutions for Commercial Refrigeration Applications

Many end-users and equipment manufacturers are investigating ways to minimize their impact on the environment while adapting and improving their system architecture. The F-Gas Regulation is accelerating the commercial refrigeration market transition to future-proof refrigerants and improved new system architectures.

R290 (Propane) is one of the most-discussed refrigerants which has long been known for its good performance. R290 is a future-proof refrigerant with excellent thermodynamic properties and it is becoming an attractive natural refrigerant choice for distributed system architectures such as self-contained display cases, cold room units and centralized systems like secondary systems or refrigeration medium temperature chillers with a glycol loop.

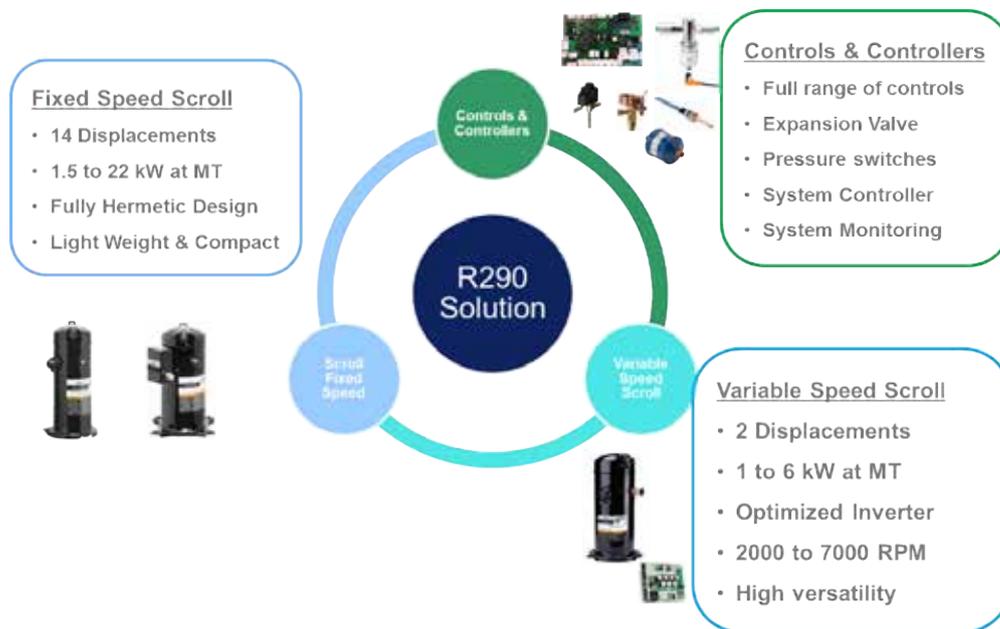


Self-contained display cases

Cold room units

Secondary systems

Emerson is investing in research and development activities in order to pro-actively support and guide the customers to go through the F-Gas transition phase. Emerson's complete R290 solutions with a broad portfolio of compressors, flow controls and system electronics address the needs of distributed system architectures and centralized systems.

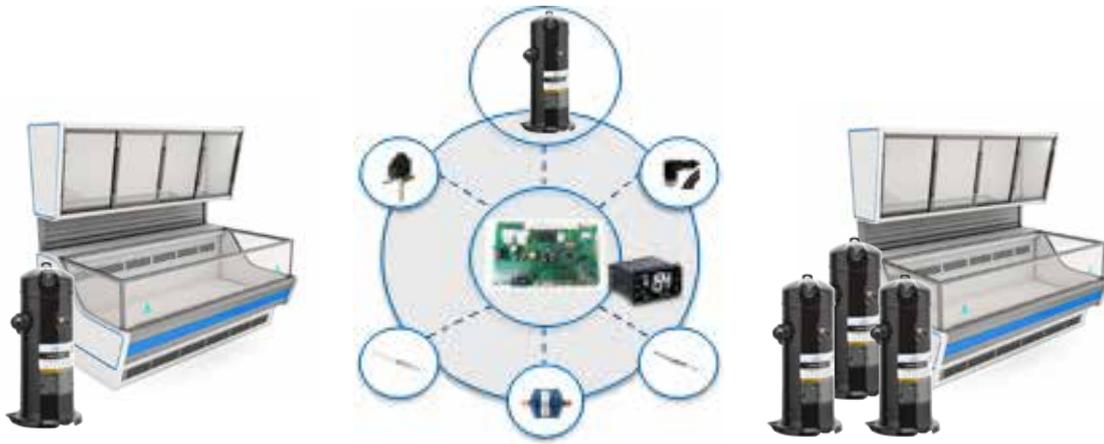


Solutions for Self-Contained Display Cases

Self-contained display case system architecture provides several benefits such as flexibility due to plug and play type system design, reduced maintenance costs, lower environmental impact (low TEWI value) due to lower leakage rate and comparable or slightly better efficiency in comparison to centralized systems.

Self-contained display case with hydrocarbons is a proven solution for low temperature applications. The self-contained display case application for medium temperature applications with hydrocarbons has also become an attractive solution.

The system design is possible using multiple circuit with below 150g charge per circuit and alternatively using single circuit above 150g per charge limit. Emerson R290 solutions addresses both applications with multiple circuit and single circuit applications.



Scroll compressors offer the benefits of compactness ideal for this application and fully hermetic design guaranteeing the safety for flammable refrigerants. The ZBKAU range is suitable for self-contained display case medium and low temperature applications below 150g charge per limit. ZBKCU range with ATEX compliance and ZBV variable speed compressors are ideal for self-contained display case applications for medium and low temperature applications above 150g refrigerant charge. Emerson system controller customized for self-contained display case applications in combination with flow controls, monitoring system and compressors provides the complete solution required.

Solutions for Cold Room Units

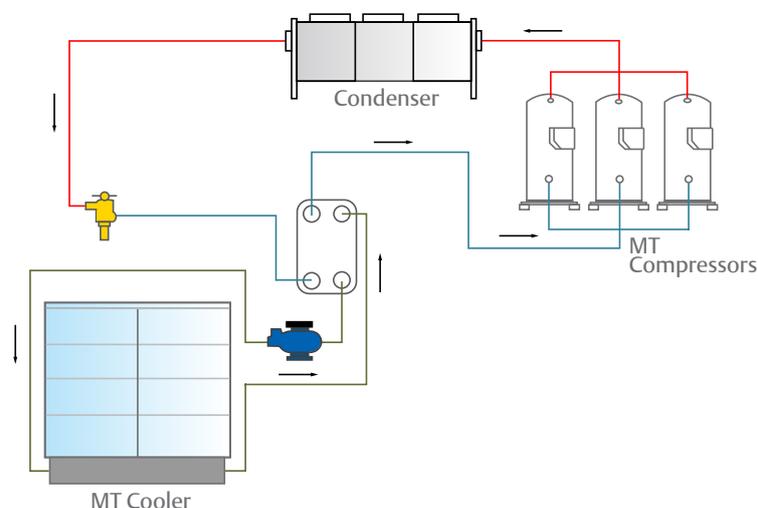
Cold Room units are typically equipped with piston hermetic compressors. Scroll compressors with compact design with 3 feet compact design and significant energy efficiency benefit compared to piston hermetic design is an ideal choice for cold room units applications.

Emerson R290 scrolls with ZBKAU and ZBKCU series are suitable for both medium and low temperature applications below and above 150g applications. Compressors in combination with flow controls and monoblock controller completes the solution for cold room applications.



Solutions for Secondary Systems

Propane is an attractive refrigerant on the high side of the secondary systems to make it completely natural. Summit range of Emerson R290 scrolls with fully hermetic scroll design is an ideal choice to avoid refrigerant leaks and safe choice for flammable refrigerants.



Summit range of compressors with 4 models provides cooling capacity range from 12 to 22kW. These compressors can be used in tandem configuration with passive oil management and also using OM3 for active oil management.

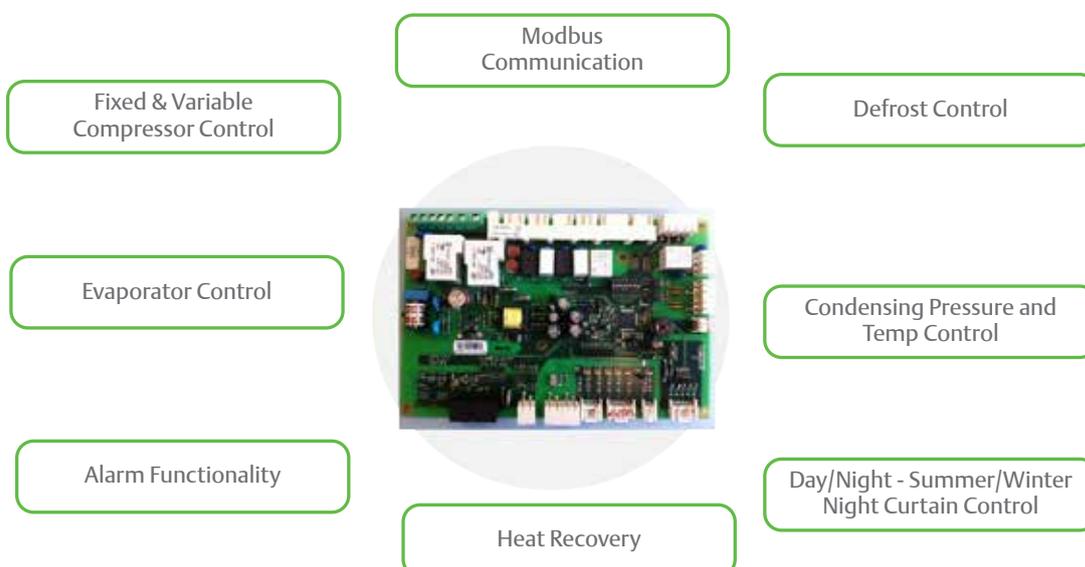
Emerson R290 Solutions Overview

Products for use in Zone 2 according to ATEX definition	
Product Description	
Electronic Expansion Valves	EX4-7-...FLR
Electrical plug and cable assembly for EX Valves	EVC05A
Thermo Expansion Valves	TX3-...FLR
Solenoid Valves	200RB...-FLR
Coil for Solenoid Valve	ASC24V + PG9 ATEX ASC230V + PG9 ATEX
Pressure Transmitter	PT5-...-FLR
Pressure Switch	PS4-...ATEX
Filter Driers	ADK-...FLR
Moisture Indicator	MIA-...-FLR

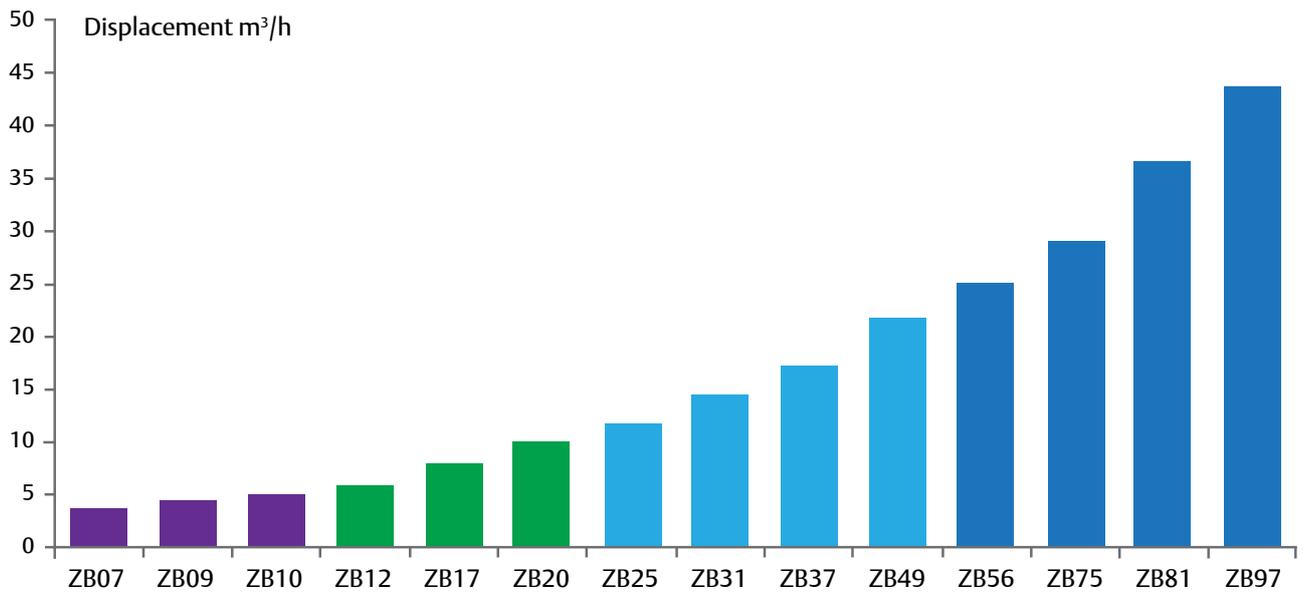


Additional Products for Non ATEX environment	
Product Description	
Superheat Controller with EX Valves	EC3-P32 / -P33
Oil Management TraxOil	OM3-020P
Compressor Soft Starter	CSS-25U / CSS-32U
Electronic Expansion Valves for heat pumps	EXM/EXL
Superheat Controller with EXM/L Valves	EXD-HP1/2

Self-Contained Display Case Controller



R290 Scroll Overview



Emerson R290 Scrolls Overview

ZBKAU Compressors

Applications:

- Ideal for self-contained display case with multiple circuit design
- Packaged condensing units for cold room applications
- Suitable for applications below 150g R290 refrigerant charge

Key Features and Benefits:

- 3-feet design with compactness and less weight
- Reduced internal free volume for below 150g applications
- High efficiency and low sound level

Compressor	Displacement (m³/h)	Cooling Capacity (kW) *
ZB07KAU	3.7	1.7
ZB09KAU	4.4	2.0
ZB10KAU	5.0	2.3

* Condition: Evaporating: -10°C Evaporating, 45°C Condensing, 10K Superheat, 0K Subcooling



ZBKCU Compressors

Applications:

- Ideal for self-contained display case with single circuit design
- Packaged condensing units for cold room applications
- Suitable for applications above 150g R290 refrigerant charge

Key Features and Benefits:

- Fully hermetic scroll design – safe for flammable refrigerants
- ATEX compliance
- Flexibility to use for Medium and Low Temperature applications

Compressor	Displacement (m³/h)	Cooling Capacity (kW) *
ZB12KCU	5.8	2.8
ZB17KCU	8.0	3.8
ZB20KCU	10.0	4.8
ZB25KCU	11.7	5.7
ZB31KCU	14.4	7.0
ZB37KCU	17.1	8.3
ZB49KCU	21.4	10.4

* Condition: Evaporating: -10°C Evaporating, 45°C Condensing, 10K Superheat, 0K Subcooling





ZBK5U Compressors

Applications:

- Ideal for R290 secondary systems or refrigeration chillers
- Suitable for small cascade systems

Key Features and Benefits:

- Compactness and less weight
- Single compressor and multiple compressor applications
- High efficiency and reduced noise

Compressor	Displacement (m ³ /h)	Cooling Capacity (kW) *
ZB56K5U	24.8	12.5
ZB75K5U	29.0	15.0
ZB81K5U	36.3	18.0
ZB97K5U	43.3	21.5

* Condition: Evaporating: -10°C Evaporating, 45°C Condensing, 10K Superheat, 0K Subcooling



ZBV Compressors

Applications:

- Ideal for packaged units for cold rooms
- Suitable for small cascade and secondary systems
- Self-contained display case with single circuit design

Key Features and Benefits

- Wide modulation range from 30 to 117Hz
- Optimized drive in combination with the compressor
- Suitable for applications above 150g refrigerant charge

Compressor	Displacement (CC)	Cooling Capacity (kW) *
ZBV021	21	3.0kW @ 86Hz
ZBV029	29	4.2kW @ 86Hz

* Condition: Evaporating: -10°C Evaporating, 45°C Condensing, 10K Superheat, 0K Subcooling



For more details, see www.emersonclimate.eu

Emerson Climate Technologies - European Headquarters - Pascalstrasse 65 - 52076 Aachen, Germany
 Tel. +49 (0) 2408 929 0 - Fax: +49 (0) 2408 929 570 - Internet: www.emersonclimate.eu

The Emerson Climate Technologies logo is a trademark and service mark of Emerson Electric Co. Emerson Climate Technologies Inc. is a subsidiary of Emerson Electric Co. Copeland is a registered trademark and Copeland Scroll is a trademark of Emerson Climate Technologies Inc.. All other trademarks are property of their respective owners. Emerson Climate Technologies GmbH shall not be liable for errors in the stated capacities, dimensions, etc., as well as typographic errors. Products, specifications, designs and technical data contained in this document are subject to modification by us without prior notice. Illustrations are not binding.
 © 2016 Emerson Climate Technologies, Inc.