Outdoor Refrigeration Unit - ZX Range



High efficiency in compact design

EMERSON

Outdoor refrigeration unit - ZX

The best choice for small retail and food service applications

The new generation of Copeland™ ZX outdoor refrigeration units offers additional benefits for wholesalers, installers and operators.

Simplifying refrigeration system integration

For years, Copeland outdoor refrigeration units have brought innovation to refrigeration by providing solutions for quick and easy installation. Regular communication between Emerson and its customers has resulted in the latest outdoor refrigeration unit design, taking this concept one step further. The combination of proven Copeland scroll technology with the unit's compact design and latest control technology exactly meets the market requirements.

Building integration with maximum space saving

The ZX refrigeration units are:

- Built for any type of outdoor applications
- Perfect for wall or roof installation in city centres

Simple installation

The improved accessibility, the pre-configured controller and a clear interface design enable time and money saving installations.

One refrigeration unit - Multiple refrigerants at best efficiency

All Copeland ZX refrigeration units are suitable for multiple refrigerants. Depending on the application models are qualified for R134a, R404A, R407A, R407F, R448A, R449A, R450A and R513A. This allows for reduced number of models, simplifies logistics and increases flexibility.

Urban environment integration through noise attenuation

A significant noise attenuation is guaranteed through:

- The integration of low speed fan motors with sickle blades and fan speed controller
- The intelligent fan speed control can be adjusted to match perfectly to the application requirements and reduces the sound level during night when temperatures tend to be low.

Energy savings

- Copeland scroll compressor with significantly higher efficiency than traditional piston compressors in the target applications
- Enhanced condenser coil and fan combination with automatic adjustment of condensing temperature to ambient conditions
- Precise electronic section pressure control allows for optimized set points
- Vapor injection technology on low temperature models further improves the operational efficiency
- ZX refrigeration units meet the efficiency requirements of the Ecodesign Directive (2009/125/EC).

EcoDesign Compliant

High reliability through diagnostic protection capabilities

The unique system controller displays the operating status in real time. It allows for precise adjustment of all relevant parameters for optimized operation. The controller features Modbus communication and easy customization with a Hotkey. Furthermore it provides unique protection against the following:

- Over-current
- Phase imbalance
- Phase loss
- Incorrect phase rotation



Galvanized panels and a coated condenser provide high level weather protection.

Reduced life cycle cost

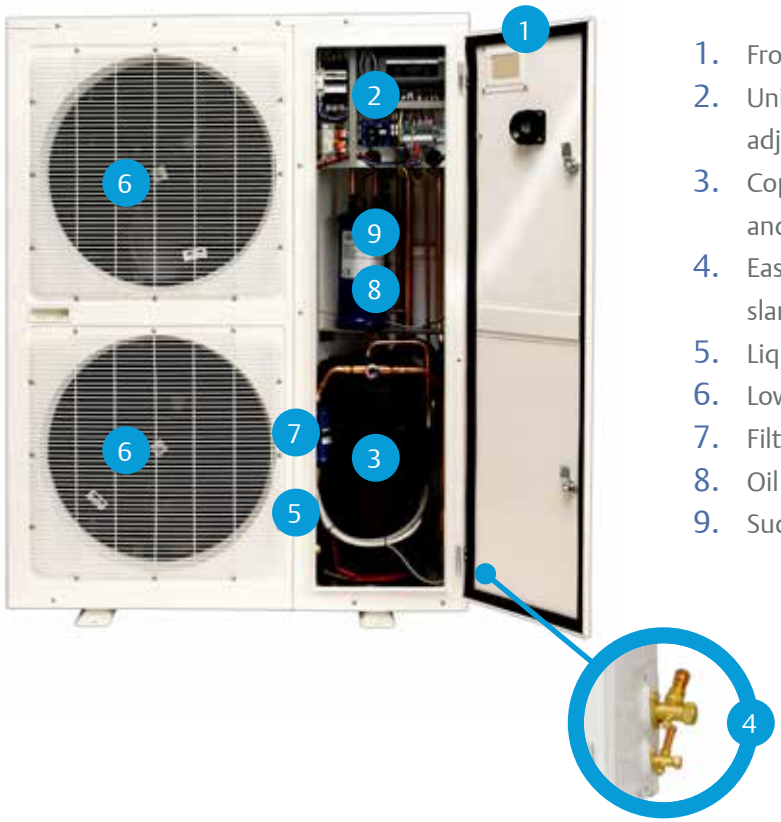
With very short installation time, superior efficiency and high reliability Copeland ZX condensing unit helps customers to reduce "total life cycle costs" to a minimum.

The new Copeland series of outdoor refrigeration units are specifically designed to cater for a wide range of refrigeration applications covering medium and low evaporating temperatures.

Typical applications for Copeland ZX include:

- Convenience stores
- Cold rooms
- Fast food chains and restaurants
- Beverage coolers

Features Copeland™ ZX



1. Front door with quick check window
2. Universal controller with status display and adjustable settings
3. Copeland scroll compressor with crankcase heater and sound jacket
4. Easy, accessible suction and liquid line connections – slanted for compact design
5. Liquid line isolating valve for drier replacement
6. Low speed fan motors with sickle blades
7. Filter drier and sight glass
8. Oil separator (LT version only)
9. Suction accumulator (LT version only)

Performance data for medium and low temperature models

Medium Temperature Models	Capacity (kW*)							
	R134a	R404A	R407A	R 407F	R448A	R449A	R450A	R513A
ZXME-020E	2.25	3.58	3.48	3.37	3.42	3.42	1.97	2.34
ZXME-025E	2.65	4.24	4.02	4.20	3.83	3.89	2.28	2.71
ZXME-030E	3.24	5.24	4.92	4.92	5.05	5.05	2.91	3.44
ZXME-040E	4.36	6.99	6.26	6.52**	6.58	6.58	3.94	4.63
ZXME-050E	5.49	9.12	8.65	8.64	8.77	8.77	4.96	5.89
ZXME-060E	6.51	10.40	9.75	9.74	10.05	10.05	5.78	6.84
ZXME-075E	7.46	11.90	11.25	11.20	11.55	11.60	6.48	7.65

*EN 13215 Conditions: Te -10°C, Ta = 32°C, SGT 20°C
** Conditions: EN13215: Suction Superheat 10K

Low Temperature Models	Capacity (kW*)				
	R404A	R407A	R407F	R448A	R449A
ZXLE-020E	1.79	1.39	1.46	1.45	1.45
ZXLE-030E	2.55	1.98	2.08	2.06	2.06
ZXLE-040E	3.96	3.04	3.19	3.16	3.16
ZXLE-050E	4.50	3.50	3.67	3.62	3.62
ZXLE-060E	5.65	4.16	4.35	4.56	4.56
ZXLE-075E	6.35	4.68	4.91	5.11	5.11

*EN 13215 Conditions: Te -35°C, Ta = 32°C, SGT 20°C

Outdoor refrigeration unit - ZX digital

The compact solution for continuous capacity modulation

Copeland™ ZX digital refrigeration units represent the top level of the ZX product platform. The advantages of the standard models compactness, silence and efficiency are further extended by the capability of continuous capacity modulation. This makes ZX digital refrigeration units the perfect fit for applications with wide load variations.

Simplifying capacity modulation

On many refrigeration systems the load will vary over a wide range, thus requiring the use of capacity control if a high frequency of system on/off cycles should be avoided. Based on the unique and proven Copeland scroll digital compressor technology, the ZX digital refrigeration units operate on a simple mechanism.

Capacity control is achieved by separating the compressor scroll sets axially over a short period of time. It is a simple mechanical solution allowing precise temperature control thus improving system efficiency.



Reducing installation effort

ZX digital refrigeration units are ready for operation and can easily and quickly be implemented into any system design. Compared to alternative modulation solutions like parallel condensing units or compressor speed control ZX digital units significantly reduce installation time. In addition the compact dimensions and light weight enable easy handling.

Energy savings with digital scroll technology

Digital scroll technology provides:

- Continuous modulation from 10% to 100% capacity
- No restrictions to the operating envelope
- Immediate load adjustment
- Reduced compressor cycling with high current starting periods to a minimum
- Precise temperature control that allows lifting the evaporating temperature thus saving energy
- Superior energy efficiency through low condensing temperatures in capacity modulation mode

Preserving food quality

As a result of digital continuous modulation system, pressures and temperatures are tightly controlled which allows:

- An accurate control of display case and cold room temperatures
- Precise adjustment of evaporating temperatures
- Less dehumidification of the food and preservation of food quality

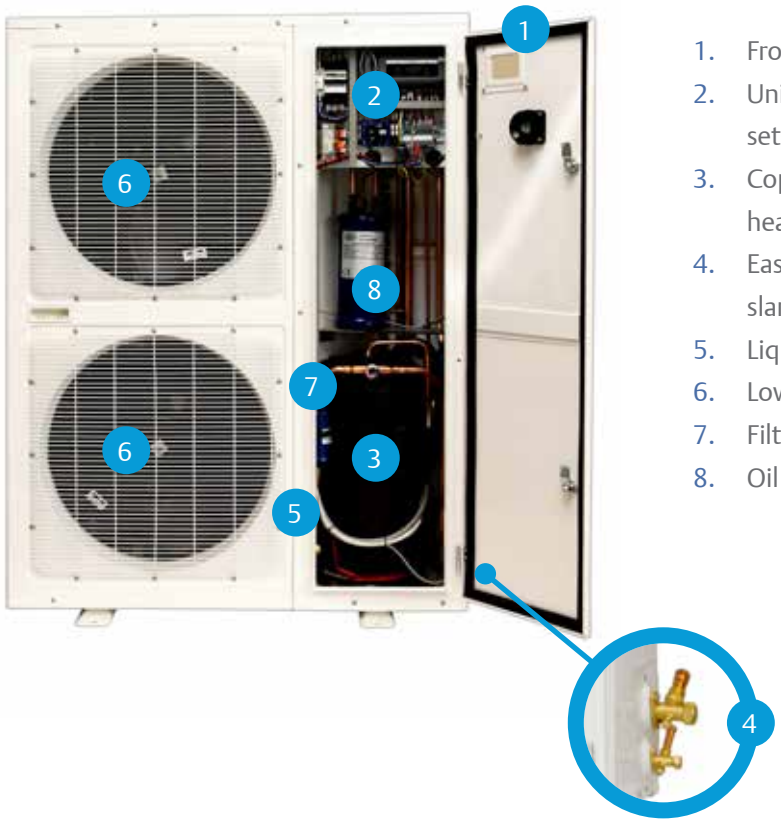
Reducing system downtime and lifecycle costs

The refrigerant flow back to a digital scroll compressor is identical to a standard scroll compressor, even at low capacity. The digital scroll compressor motor runs at full speed at all times, never slowing the oil flow to the compressor. Its reliability level is as high as in standard compressors. It does not cause motor overheating or resonance vibrations in the refrigeration unit. The reliability of ZX digital refrigeration units is further supported by:

- Less mechanical stress on the unit due to fewer start/stop cycles
- Selection of adjusted quality components including the controller
- Proven digital scroll technology
- Equipped with oil separator to guarantees constant oil levels
- Oil separator to guarantee constant oil levels

Thanks to those features the ZX digital refrigeration units significantly improve system reliability reduce system downtime and lifecycle costs.

Features Copeland™ ZX digital



1. Front door with quick check window
2. Universal controller with status display and adjustable settings
3. Copeland scroll digital compressor with crankcase heater and sound jacket
4. Easy, accessible suction and liquid line connections – slanted for compact design
5. Liquid line isolating valve for drier replacement
6. Low speed fan motors with sickle blades
7. Filter drier and sight glass
8. Oil separator

Performance data for medium temperature models with capacity modulation

Medium Temperature Models	Capacity (kW*)							
	R134a	R404A	R407A	R407F	R448A	R449A	R450A	R513A
ZXDE-030E	3.33	5.27	5.08	4.94	5.13	5.13	2.93	3.47
ZXDE-040E	4.29	7.58	7.28	7.20	7.21	7.21	3.99	4.78
ZXDE-050E	5.26	9.03	8.65	8.64	8.65	8.65	4.88	5.81
ZXDE-060E	6.34	10.45	9.75	8.96	10.10	10.10	5.74	6.83
ZXDE-075E	7.21	11.80	11.25	10.20	11.40	11.40	6.47	7.70

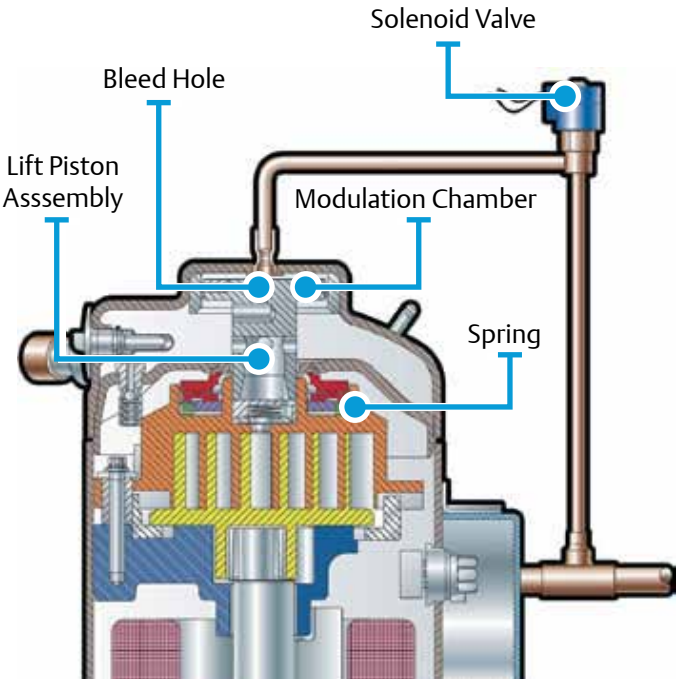
*EN 13215 Conditions, Te -10°C, Ta = 32°C, SGT 20°C

Digital capacity modulation

Digital mechanism

Capacity modulation is based on PWM (Pulse Width Modulation) control of a solenoid valve that operates a piston fitted rigidly to the upper scroll. This piston is actuated by gas pressure. The solenoid opens to allow the modulation chamber to communicate with suction via the external tube.

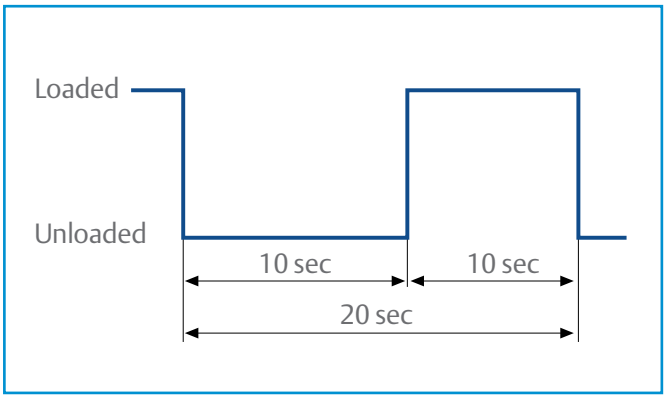
Discharge pressure on the lower side of the piston forces it upwards, bringing with it the upper scroll – there is no compression. When the solenoid closes, pressure builds up in the modulation chamber. Pressure in the modulation chamber is controlled via a small bleed hole. The upper scroll moves down to its normal contact position – compression resumes.



Cycle time

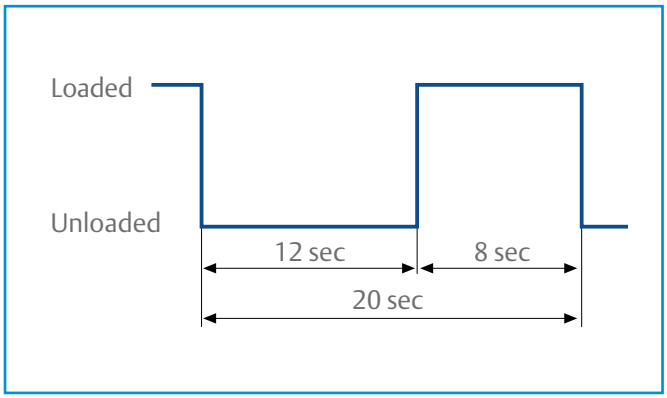
The compressor capacity is controlled by modulating the solenoid valve input over time.

Example 1:
Cycle time: 20 sec
Valve inactive/closed: 10 sec
Valve active/open: 10 sec
Resulting capacity: 50%



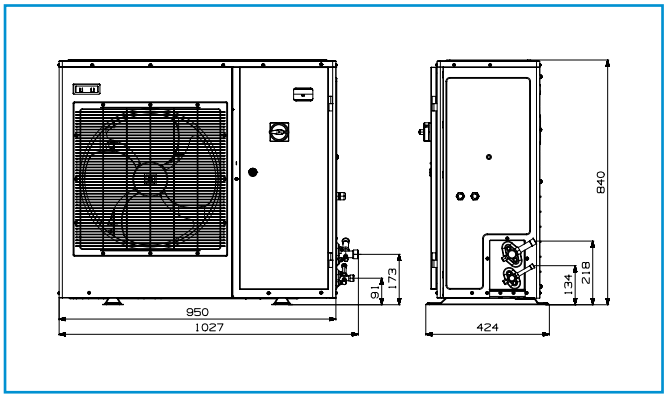
50% Modulation

Example 2:
Cycle time: 20 sec
Valve inactive/ closed: 8 sec
Valve active/open: 12 sec
Resulting capacity: 40%

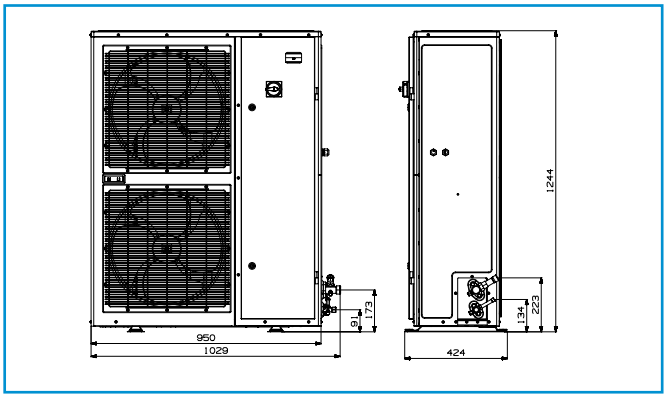


40% Modulation

Dimensions



Single Fan Units



Dual Fan Units

Technical overview ZX

Model	Displacement (m^3/h)	Max. Operating Current (A)	Number of Fans	Total Fan Motor Power	Connection Lines		Height (mm)	Width (mm)	Depth (mm)	Weight (kg)	Sound Level (db[A])**	
					Suction	Liquid					Max. Fan Speed	Reduced Fan Speed
Medium Temperature 380-420V / 50Hz / 3~												
ZXME-020E-TFD	5.9	5.0	1	116	¾	½	840	1029	424	76	39	36
ZXME-030E-TFD	8.6	6.1	1	116	¾	½	840	1029	424	79	40	37
ZXME-040E-TFD	11.7	7.5	1	116	⅞	½	840	1029	424	91	40	37
ZXME-050E-TFD	14.4	9.6	2	246	⅞	½	1242	1029	424	108	41	38
ZXME-060E-TFD	17.1	11.5	2	246	⅞	½	1242	1029	424	112	41	38
ZXME-075E-TFD	18.8	11.9	2	246	⅞	½	1242	1029	424	118	42	39
Medium Temperature 220-240V / 50Hz / 1~												
ZXME-020E-PFJ	5.9	12.8	1	116	¾	½	840	1029	424	76	39	36
ZXME-025E-PFJ	6.8	14.2	1	116	¾	½	840	1029	424	76	39	36
ZXME-030E-PFJ	8.6	16.4	1	116	¾	½	840	1029	424	79	40	37
ZXME-040E-PFJ	11.7	23.5	1	116	⅞	½	840	1029	424	91	40	37
Low Temperature 380-420V / 50Hz / 3~												
ZXLE-020E-TFD	6.1	5.7	1	116	¾	½	840	1029	424	79	39	36
ZXLE-030E-TFD	8.0	6.7	1	116	¾	½	840	1029	424	81	40	37
ZXLE-040E-TFD	12.7	9.2	1	116	⅞	½	840	1029	424	93	40	37
ZXLE-050E-TFD	14.4	11.9	2	246	⅞	½	1242	1029	424	106	41	38
ZXLE-060E-TFD	17.1	13.7	2	246	⅞	½	1242	1029	424	116	41	38
ZXLE-075E-TFD	18.8	14.6	2	246	⅞	½	1242	1029	424	121	41	38
Low Temperature 220-240V 50Hz 1~												
ZXLE-020E-PFJ	6.1	14.4	1	116	¾	½	840	1029	424	79	39	36
ZXLE-025E-PFJ	7.1	16.4	1	116	¾	½	840	1029	424	80	40	37
ZXLE-030E-PFJ	8.0	18.6	1	116	¾	½	840	1029	424	81	40	37

** ISO 3744 @ 10 m

Technical overview ZX

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Medium Temperature 380-420V / 50Hz / 3~												
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ZXDE-050E-TFD	14.4	10.4	2	246	⅞	½	1242	1029	424	112	41	38
ZXDE-060E-TFD	17.1	11.6	2	246	⅞	½	1242	1029	424	114	41	38
ZXDE-075E-TFD	18.8	12.4	2	246	⅞	½	1242	1029	424	119	42	39

** ISO 3744 @ 10m

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For more details, see www.climate.emerson.com/en-gb

Emerson Commercial & Residential Solutions
Emerson Climate Technologies GmbH - Pascalstrasse 65 - 52076 Aachen, Germany
Tel. +49 (0) 2408 929 0 - Fax: +49 (0) 2408 929 570 - Internet: www.climate.emerson.com/en-gb

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