

Copeland outdoor refrigeration unit - ZX range

High efficiency in compact design



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 Copeland 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).



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

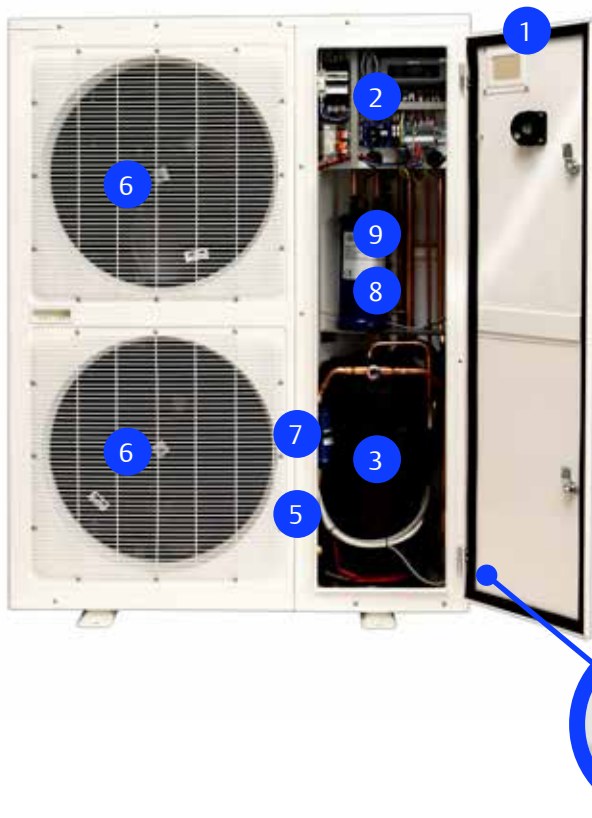
With very short installation time, superior efficiency and high reliability Copeland ZX refrigeration unit helps customers to reduce "total life cycle costs" to a minimum.

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

Typical applications for ZX units include:

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

Copeland ZX refrigeration unit features



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 (*low temperature version only*)
9. Suction accumulator (*low temperature version only*)

Capacity data

Medium Temperature Models	Cooling 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: Evaporating -10°C, Ambient 32°C, Suction Gas Return 20°C

** Conditions: EN13215: Suction Superheat 10K

Low Temperature Models	Cooling Capacity (kW*)				
	R134a	R404A	R407A	R 407F	R448A
ZXLE-020E	1.79	1.39	1.46	1.45	1.45
ZXLE-025E**	2.11	1.63	1.71	1.71	1.71
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: Evaporating -35°C, Ambient 32°C, Suction Gas Return 20°C

** : single phase only

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 model's 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

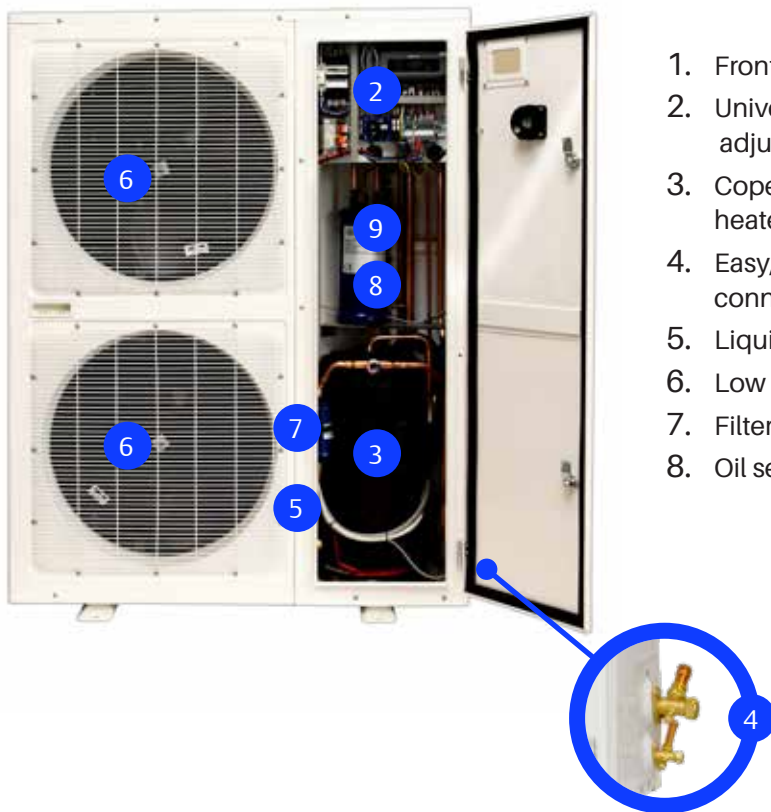
Reducing system downtime and lifecycle costs

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
- 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.

Copeland ZX digital refrigeration unit features



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

Capacity data

Digital Medium Temperature Models	Cooling 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: Evaporating -10°C, Ambient 32°C, Suction Gas Return 20°C

Digital capacity modulation

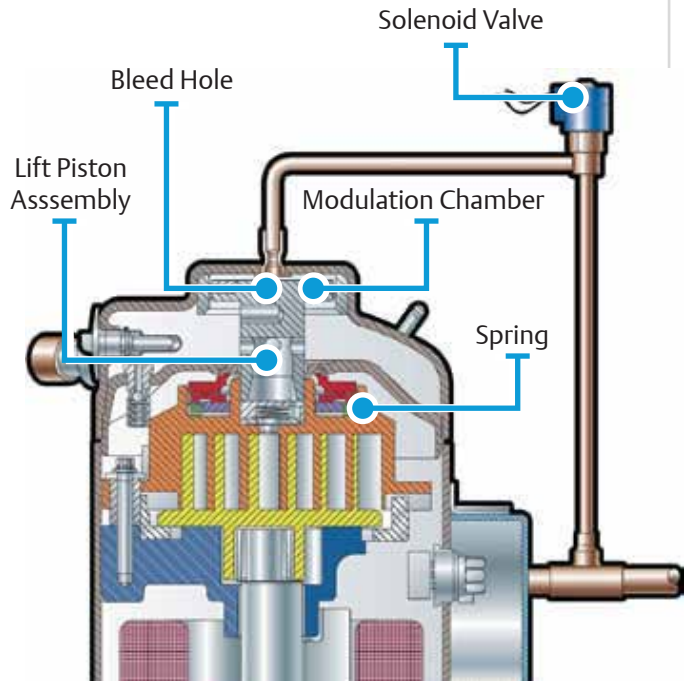
Digital mechanism

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.

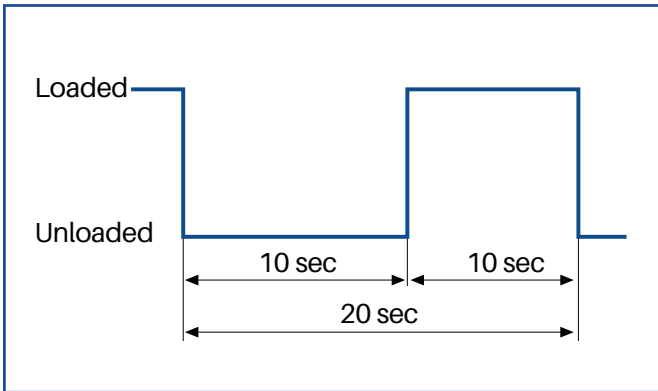


Example 1:

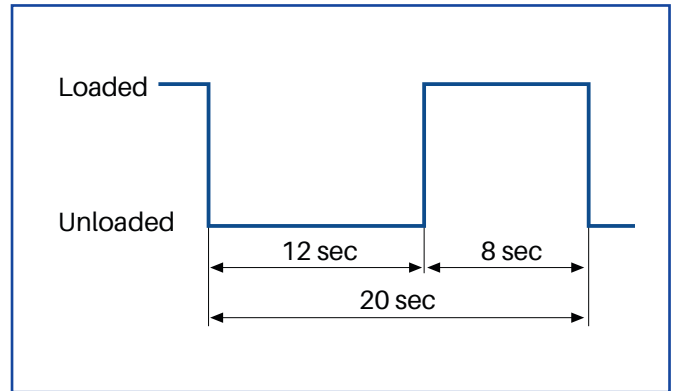
Cycle time: 20 sec
Valve active/open: 10 sec
Valve inactive/closed: 10 sec
Resulting capacity: 50%

Example 2:

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

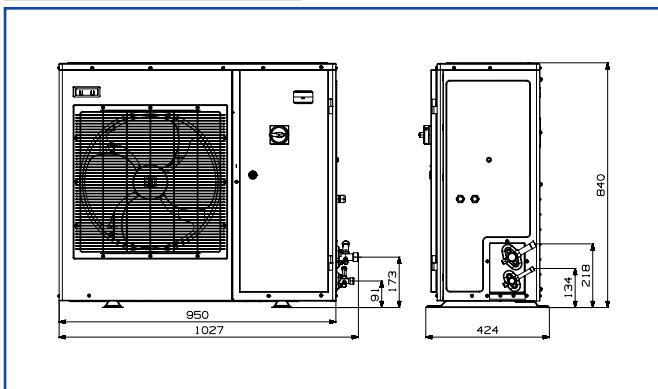


50% Modulation

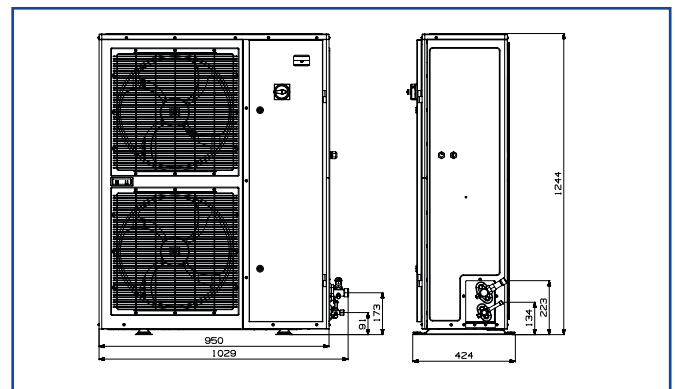


40% Modulation

Dimensions



Single Fan Units



Dual Fan Units

Technical overview

Model	Displacement (m ³ /h)	Receiver Capacity (l)	Number of fans	Total Fan Motor Power (W)	Suction Line Diameter (inch)	Liquid Line Diameter (inch)	Width/Depth/Height (mm)	Net Weight (kg)	Motor Version/Code		Maximum Operating Current (A)		Locked Rotor Current (A)		Sound Pressure @10m - d(BA) ^{***}
									1 Ph*	3 Ph**	1 Ph*	3 Ph**	1 Ph*	3 Ph**	
Medium Temperature Models															
ZXME-020E	5.9	4.1	1	116	3/4	1/2	446/1035/840	76	PFJ	TFD	13	5	58	26	37
ZXME-025E	6.8	4.1	1	116	3/4	1/2	446/1035/840	79	PFJ	TFD	12	5	61	38	37
ZXME-030E	8.6	4.1	1	116	3/4	1/2	446/1035/840	79	PFJ	TFD	16	7	82	40	38
ZXME-040E	11.7	4.1	1	116	3/4	1/2	446/1035/840	91	PFJ	TFD	24	10	114	49	38
ZXME-050E	14.4	5.9	2	246	7/8	1/2	447/1035/1244	108		TFD		13		66	41
ZXME-060E	17.1	5.9	2	246	7/8	1/2	447/1035/1244	112		TFD		13		74	41
ZXME-075E	18.8	5.9	2	246	7/8	1/2	447/1035/1244	118		TFD		14		101	41
Low Temperature Models															
ZXLE-020E	6.1	4.1	1	116	3/4	1/2	446/1035/840	79	PFJ	TFD	14	6	57	39	37
ZXLE-025E	7.1	4.1	1	116	3/4	1/2	446/1035/840	79	PFJ		16		74		39
ZXLE-030E	8.0	4.1	1	116	3/4	1/2	446/1035/840	81	PFJ	TFD	18	7	82	36	37
ZXLE-040E	12.7	4.1	1	116	7/8	1/2	446/1035/840	93		TFD		9		52	38
ZXLE-050E	14.4	5.9	2	246	7/8	1/2	447/1035/1244	106		TFD		12		52	41
ZXLE-060E	17.1	5.9	2	246	7/8	1/2	447/1035/1244	116		TFD		14		74	41
ZXLE-075E	19.8	5.9	2	246	7/8	1/2	447/1035/1244	121		TFD		15		101	41
Digital Medium Temperature Models															
ZXDE-030E	8.3	4.1	1	116	3/4	1/2	446/1035/840	79		TFD		7		40	40
ZXDE-040E	11.4	5.9	2	246	7/8	1/2	447/1035/1244	104		TFD		8		48	40
ZXDE-050E	14.4	5.9	2	246	7/8	1/2	447/1035/1244	108		TFD		11		64	41
ZXDE-060E	17.1	5.9	2	246	7/8	1/2	447/1035/1244	112		TFD		11		74	41
ZXDE-075E	18.8	5.9	2	246	7/8	1/2	447/1035/1244	118		TFD		14		100	42

Conditions EN13215: Evaporating Temperature MT -10°C/ LT -35°C, Ambient Temperature 32°C, Suction Gas Return 20°C

* 1ph: 230V/ 50Hz

** 3 Ph: 380-420V/ 50Hz

*** @ 10m: sound pressure level at 10m distance from the compressor, free field condition

For more details, see copeland.com/en-gb

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