

Copeland Scroll™ variable speed drive

with CoreSense™ technology



New variable speed compressor with EVC drive package maximizes energy efficiency.

Air conditioning OEMs need to ensure new chiller and rooftop designs comply with emerging part load efficiency legislation such as IEER and ESEER. Emerson's new Copeland Scroll™ variable speed compressor and drive package helps deliver performance that meets and exceeds expected legislative limits.

Controlling these devices efficiently can lead to big energy savings while optimizing comfort level control. The Copeland Scroll variable speed package comprises a permanent-magnet compressor and the EVC, Emerson's leading-edge variable speed AC motor drive. This pre-engineered, high part load efficiency rating package gives OEMs a single-source supplier, one-stop accountability and faster time-to-market.

High efficiency operation

Compressors are most efficient when running at 100% capacity or full load. However, during part load demand, the most efficient use of energy is to modulate the speed of the compressor.

The compressor package provides best-in-class operating efficiency and allows for a wide range of modulation from 1,500 to 7,200 RPM (17 to 120 Hz). The EVC drive operates the compressor at higher speeds to allow for higher capacity than would be achieved by a constant-speed compressor running at 60/50 Hz.

A single variable speed compressor can replace multiple compressors that are staged on and off to achieve complete capacity control improving overall operating efficiencies.

The compressor can also act as a trim compressor in multi-compressor applications by adjusting output to meet varying loads. The EVC drive's optional PLC functionality or separate control can then bring the other constant speed compressors online to meet demands beyond its capacity.

Key compressor drive features:

- Designed to deliver optimum efficiency and reliability while reducing design time
- Tuned/optimized motor control algorithm eliminates need to enter motor data during setup
- Motor protection
- Locked rotor protection
- Built-in Coresense compressor protections
 - Lost rotor prevention maintains drive
 - Reverse rotation prevention connections
 - Compressor missing phase protection
 - Short cycling protection
- Envelope control
- Start/shutdown procedures to provide proper lubrication; drive controls compressor start-up/shut-down
- Automatic drive speed reduction avoids nuisance trips and keeps the motor running
- Both compressor and drive are jointly UL approved for reduced design time, cost, and speed to market
- Frequency avoidance to eliminate speeds that create resonance
- Reduced design time and cost
 - High drive operating temperature up to 140°F (60°C).
 - Integrated crankcase heater eliminates external heater by using motor stator
 - Class leading compact dimensions



About the EVC drive

CoreSense technology and Emerson's unique EVC drive, combined with the latest microprocessor technology, ensure the highest efficiency and reliability for controlling energy saving permanent magnet motors. With over 30 patents pending, EVC drives are a global achievement combining Emerson's worldwide engineering and design resources and product testing processes.



Environmental compliance

- Ambient temperature: 4 °F to 140 °F (consult User Guide)
- Storage temperature: 40 °F to 158 °F
- Humidity 95 % maximum (non-condensing) at 104 °F
- Altitude: 0 to 3000m, derate 1 % per 100 m between 1000 m and 3000 m
- Random vibration: Tested in accordance with IEC 60068-2-64
- Mechanical shock: Tested in accordance with IEC 60068-2-29
- RoHS
- REACH
- IP65/NEMA4/NEMA 12/UL TYPE 12 rating is achieved on the rear of the drive when the throughhole IP65 kit is used

Key features:

- Low losses – up to 98% efficient
- EN ISO 13849-1 Cat. 3 STO; high pressure shutdown
- Built-in choke and EMC filter
- RS-485 communications standard
- Smartcard/SD card slot for parameter storage/backup/restore
- Variable speed cooling fan
- Conformal coating on all PCBs
- Aluminum chassis for easy through hole mounting enables location of heatsink to be design consideration
- Optional module slots for additional I/O or fieldbus communications
- Optional LCD keypad



Electrical conformity

- IP20/NEMA1/UL TYPE 1*
 - *UL open class as standard, additional UL Type 1 conduit kit needed to achieve Type 1
- Electromagnetic Immunity complies with EN 61800-3 and EN 61000-6-2
- With onboard EMC filter, complies with EN 61800-3 (Category C3)
- EN 61800-3 (Category C1) with optional footprint EMC filter
- IEC 60146-1-1 Supply conditions
- IEC 61800-5-1 (Electrical safety)
- IEC 61131-2 I/O
- Safe Torque Off, independently assessed by TÜV to IEC 61800-5-2 SIL 3 and EN ISO 13849-1 PL. Corresponds to an uncontrolled stop in accordance with stop category 0 of IEC 60204-1
- UL 508C (Electrical safety); UL 60730
- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- C tick

Dimensions and weight

Frame Size	Dimensions (H x W x D)	
	(mm)	(in)
5	391 x 143 x 202	15.4 x 5.6 x 7.9
6	389 x 210 x 227	15.3 x 8.3 x 8.9
7	557 x 270 x 280	21.9 x 10.6 x 11.0

Model reference and ratings

Rating	Model	Frame Size
200/240V ±10%	EVC1150B-J1	6
	EVC1185B-J1	7
380/480V ±10%	EVC1150B-K1	5
	EVC1185B-K1	6
500/575V ±10%	EVC1150B-L1	6
	EVC1185B-L1	6

*For ratings at 60 °C (140 °F), see User Guide.