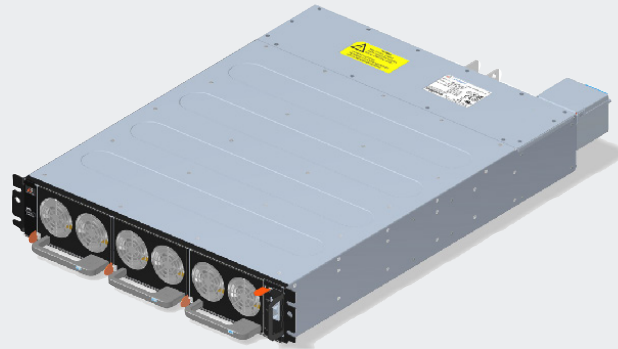


# EVERGREEN™ VENTO™ FCM30K

30,000 W Bulk Front End



Advanced Energy's FCM30K series provides for a very wide range of AC-DC embedded power requirement. Featuring high build quality with robust screw terminals, long life, and typical full-load efficiency of greater than 95.5%, these units are ideal for use in industrial and medical applications. They are backed by a comprehensive set of industrial and medical safety approvals and certificates. Variable-speed "smart fans" draw on software controls developed by Advanced Energy to match fan speed to the unit's cooling requirement and load current. Slowing the fan not only saves power but also reduces wear, thus extending its life.

## SPECIAL FEATURES

- 30,000 W output power
- 86.4 mm H x 448 mm W x 595 mm L
- -40 to +50°C
- 5 V at 2 A housekeeping
- High efficiency: >95.5% typical at full load
- Supports NFC Tag Application
- Semi F47 compliance
- Five-year warranty

## COMPLIANCE

- EMI Class A, with 6 db margin
- EN61000 Immunity

## SAFETY

- UL/IEC 62368-1
- CE LVD + RoHS (EN 62368-1 + RoHS)
- Demko CB Report for IEC 62368-1

## AT A GLANCE

### Total Power

30,000 W

### Input Voltage

187 to 528 VAC, 3 Phase 3 Wire + PE

### Number of Outputs

Single



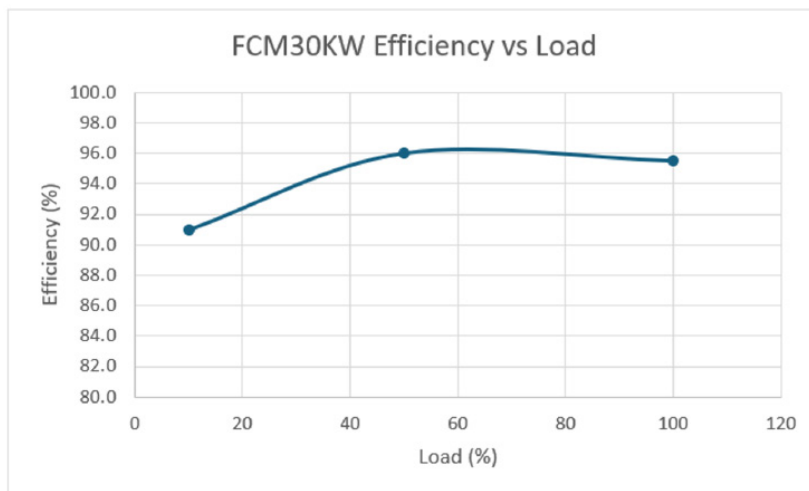
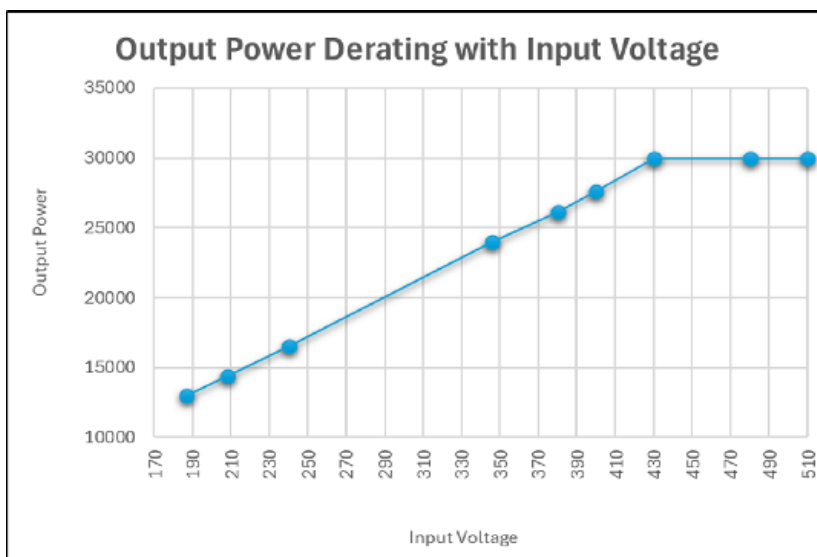
**ELECTRICAL SPECIFICATIONS**

Input	
Input Range	187 to 528 VAC, 3 phase input, 3 wire + PE (corner ground not supported) 480 VAC (nominal)
Frequency	47 to 63 Hz, nominal 50/60 Hz
Input Fusing	Recommend external circuit breaker with 63 A rating.
Inrush Current	≤ 180 A peak at 480 VAC
Power Factor	0.98 typical, meets EN61000-3-2
Harmonics	Meets IEC61000-3-2 requirements
Input Current	45 A RMS max input current at 480 VAC
Hold Up Time	> 12 ms minimum for at 30,000 W load > 20 ms minimum for at 18,000 W load
Efficiency	> 95.5% typical at full load, 480 VAC nominal
Power Line Transient Protection	Suitable MOV after input fuse for modules with added SPD (Surge Protective Device) within the shelf.
Isolation Voltage	Meets UL62368

Output		
Output Voltage	Main output: 54.5 VDC Standby output: 5 VDC	
Output Trimming Range	48 to 60 VDC	
Output Current	Main output at 550 A max Standby at 2 A available for system side	
Minimum Load	Main output at 0 A Standby at 0 A	
Output Ripple / Noise (PARD)	Main output: 1% of voltage setting Standby: 100 mV	Measured with 0.1 μF ceramic and 10 μF tantalum Capacitor on any output, 20 MHz
Output Turn On Overshoot	< 5% of voltage setting	
Transient Response	±5% of nominal output voltage	Load transient change of ±25% with 5% minimum load
Current Sharing	< 5% for 50%-100% load current	Main output: support shelf to shelf current sharing. Accuracy TBD. Standby: none
Max Number of Unit in Parallel	Up to 3 shelves, refer to engineering team for more details	
Protections	UV/OV, OCP, OVP, OTP, ACUV, etc.	
Output Isolation	Default product has main output isolated (100 VDC) from PSU chassis and meets functional isolation requirements. Product with output ground terminated to chassis is available upon request.	

**ELECTRICAL SPECIFICATIONS**

Output Power Derating vs Input Line Voltage	
480 VAC	30,000 W
440 VAC	30,000 W
400 VAC	27,600 W
380 VAC	26,100 W
360 VAC	24,900 W
346 VAC	24,000 W
240 VAC	16,500 W
208 VAC	14,400 W



**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature	-40°C to +50°C; Start at -40°C requires a 5 minutes operating warm-up. Above +50°C to 70°C, power derated linearly. Derating curve TBD.
Storage Temperature	-40 to +85°C
Humidity	10% to 90% non-condensing, operating
Acoustic Noise	< 83 dBA at 30°C
Altitude	3000 m for 100% load
Shock	Operating Shock: 4 G, 22 msec, half-sine pulse Non-operating (empty): 12 G, 11 msec, half-sine pulse
Vibration	Operating Sinusoidal Vibration: 0.5 G acceleration, 1.5 mm amplitude, 5 to 500 Hz. Non-operating Sinusoidal Vibration: 1 G acceleration, 3.0 mm amplitude, 5 to 500 Hz. Package: MIL-STD-810G, Method 514.6 Procedure I, Cat 7, Table 514.6C-VII, General Purpose

**SAFETY & EMC**

Conducted/Radiated Emission	EN55022/CISPR22 Class A, 6 dB Margin
Surge	2KV DM; 4KV CM
Voltage Dips and Interruptions	EN61000-4-11
ESD	8 kV contact/15 kV air
Safety	UL/IEC/62368-1
Compliance Reports	UL 62368-1, Demko CB Report for IEC 62368-1, CE LVD + RoHS

ORDERING INFORMATION

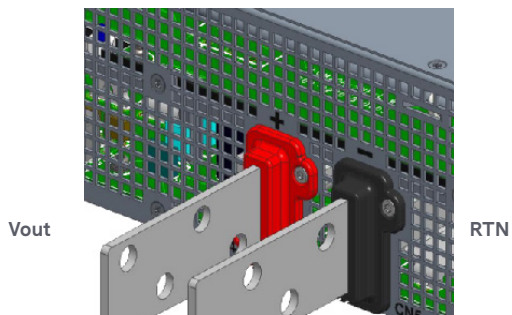
Standard	Nominal Output Voltage	Trim Range	Max Current	Standby Output	Efficiency
FCM30K-SHF	54.5 VDC	48 to 60 VDC	550 A	5 V at 2 A	95.5%

FCM30K-SHF MODEL NUMBER SCHEME													
FCM30K-SHF-Y-X-A-B-C-4XX		-	X	-	A	-	B	-	C	-	D	-	4XX
Shelf Size (mm)			Module Output Code		Input Connector Option		Interface Type		Input Option Codes		Option Codes		Hardware Code
30000 W = 86.4 x 448 x 580			Per Module Voltage Code Below		T = Input Terminal Block		Blank = MODBUS/Artybus		Blank = PMI Added		Blank = No Option		4XX = Mod Codes
					P = Input Connection Plug (pluggable module)		C = CANopen		R = PMI Removed		1 = Conformal Coating		
							E = Ethernet				2 = Future Option		
							K = EtherCAT						
							M = MODBUS TCP						
Voltage Range Y =													
Code	Volts												
L	24-200		W										
M	300-500		Future										
H	850-1500		Future										



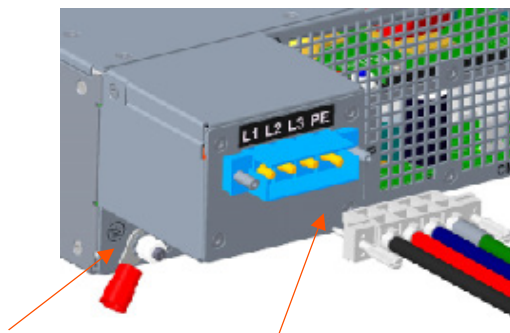
MECHANICAL DRAWINGS

DC Output Busbar



Material: 3.0 mm COPPER PLATE  
Tin-Nickel Plated  
Fit with Ring Terminal, M10 Stud  
Vendor P/N: CT50-10 (RS)

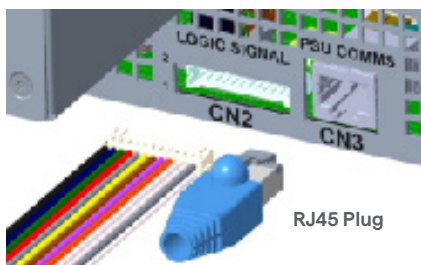
AC Input Connectors



Fixed Earth Connection  
Ring Terminal AWG8  
Vendor P/N: 19067-0008

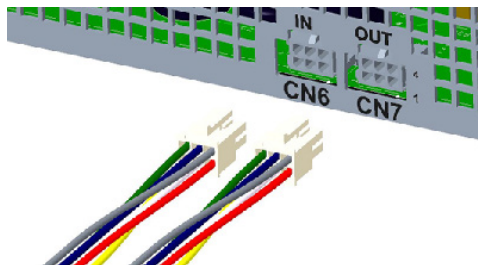
Four Pin Input Connector  
Positronics Vendor P/N: SP6RRS1M0T01/AA-PA1362  
Mating Connector  
Positronics Vendor P/N: SP6RRS1F0E01/AA-2566

Signal Mating Connectors



RJ45 Plug

AE P/N: 451-011234-0024  
Landwin Mfg P/N: 2052P2400T-01



Signal Mating Connector  
AE P/N: 438-006959-0006  
Molex Mfg P/N: 43025-0600

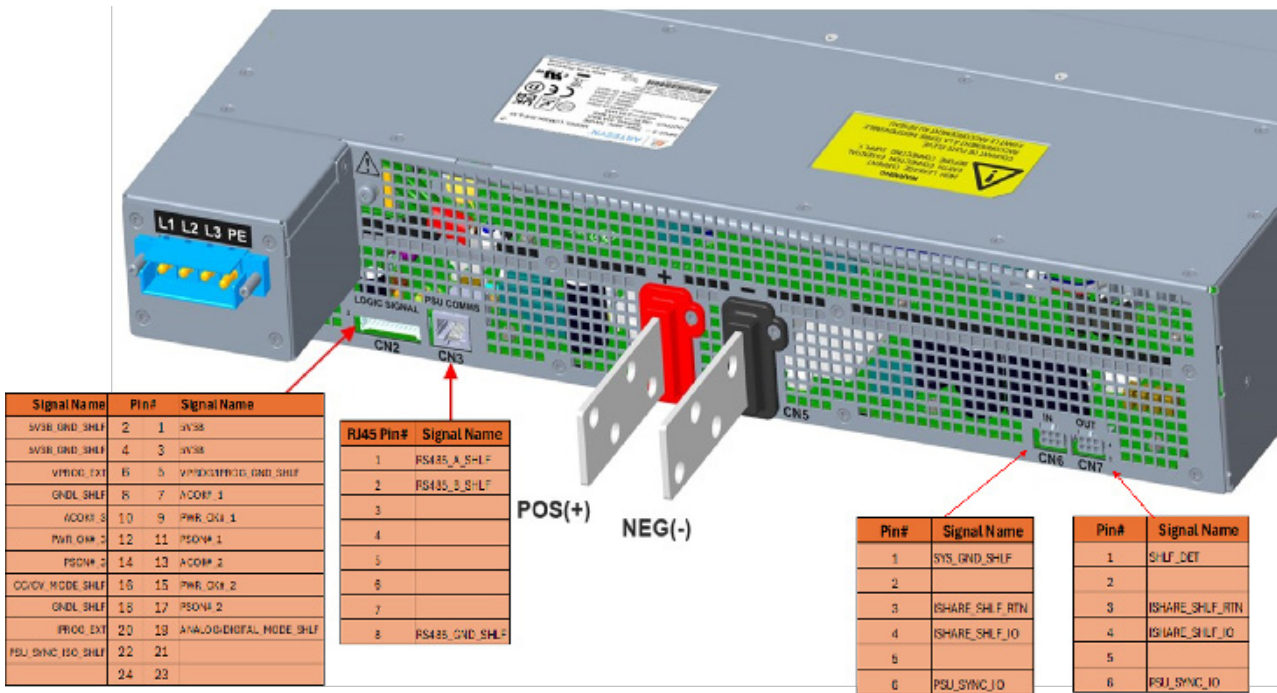
Accessories

FCM30K Test Kits: 83-788-004

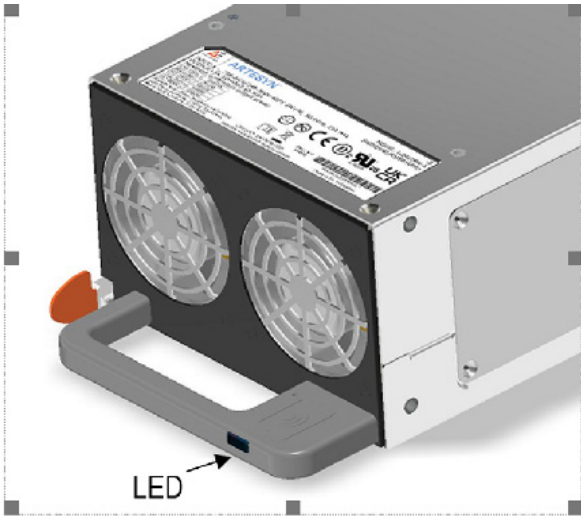
Order Part Number	Description	Diagram
750-009753-0000	Input Mating Connector	<p>Diagram showing a 24-pin connector with wires (WIRE-GRN, WIRE-BLU, WIRE-RED, WIRE-BLK) and HTSH-LUG. Dimensions include (2 Meters) <math>\pm 0.05M</math> and 10 (4x). Keying position is indicated.</p> <p>Length: mm</p>
750-011954-0001	Isolated Signal Mating	<p>Diagram showing a 24-pin connector (J5-CRIMP 24X) with wires (WIRE (REFER TO BOM)). Dimensions include 915<math>\pm 10</math> and 5.</p> <p>Length: mm</p>
750-011955-0000	Non-isolated Signal Mating	<p>Diagram showing a 6-pin connector (J11-CRIMP 6x) with wires (WIRE (refer to BOM)). Dimensions include 240<math>\pm 5</math>.</p> <p>Length: mm</p>



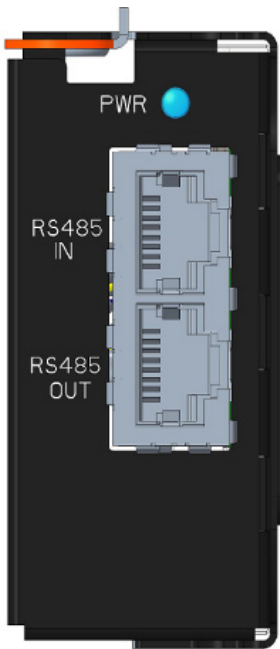
PIN ASSIGNMENT



LED Indicator



Condition	LED Status
Normal operation (AC present, standby output ON, main output ON)	Solid blue
Standby mode (main output OFF)	Blinking blue (1 s ON; 1 s OFF)
Fault	Solid amber
Wrong AC input connection sequence (L1 L2 L3)	Blinking amber (1 s ON; 1 s OFF)
AC input under voltage/over voltage	Blinking amber (3 s ON; 3 s OFF)
Module firmware update in progress	Fast blinking blue (0.5 s ON; 0.5 s OFF)



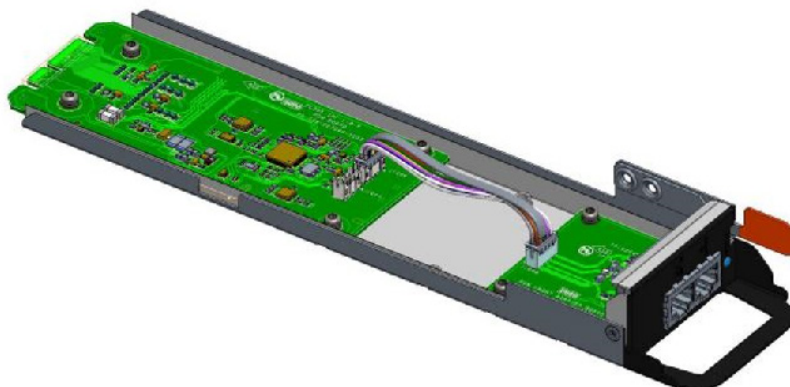
Condition	LED Status
Normal operation (INT_SUPPLY state is ON 3V3_INT_SUPPLY is ON)	Solid blue
Module firmware update in progress	Blinking blue
Module config error*	Solid amber
Shelf internal comm error	Fast amber
Shelf temp OTW	Slow amber
No AC input power	OFF

\*Default Config is 3 PSU present.

## PSM FEATURES

### Power System Manager (PSM)

Power System Manager (PSM) is a pluggable type AEI's PMC-Lite assembly that controls and oversees the PMI and Modules operations. FCM30K shelf can operate standalone without the need of PSM; provided, end customer ensures all module output V/I operating conditions are set through Modbus or I/O signals.



### Power Metering (Optional)

The power-metering interface is able to report via UART communication through PSM the following electrical input information:

Parameter	Load	Accuracy
AC input voltage	0 - 100%	±1%
AC input current	<15%	±0.5 A
	15% - 30%	±2%
	>30% - 100%	±1%
AC input active power	<10%	±25 W
	10% - 20%	±5%
	>20% - 100%	±3%
Power factor (error difference not in %)	<10%	±0.1
	10% - 30%	±0.05
	>30% - 100%	±0.01

## MECHANICAL SPECIFICATION

Parameter	Detail
Shelf metal finish	Chromate-free hot dip galvanized steel (GI steel) conforming to JIS G3302 SGCC, Z08
Shelf net weight	10.5 kgs approximate (without module)
Shelf mechanical dimensions	595 mm (D) x 448 mm (W) x 86.4 mm (H)

## MISCELLANEOUS SPECIFICATIONS

### BURN-IN

Refer to module for burn-in condition.

### MTBF

The power supply module has a minimum MTBF of 200,000 hours using the Telcordia 2 Method, with specifications at 25°C, ambient, at full load. With the power supply installed in a system in a 35°C ambient environment and operating at full load, capacitor life shall be five (5) years, minimum for ALL electrolytic capacitors contained within this power supply. The power supply shall demonstrate an MTBF level of > 500,000 hours based on actual field population operational hours.

### QUALITY ASSURANCE

Full QAV testing shall be conducted in accordance with Advanced Energy standards.

### WARRANTY

Advanced Energy shall warrant the power supply to be free of defects in materials and workmanship for a minimum period of five (5) years from the date of shipment, when operated within specifications. The warranty shall be fully transferable to the end owner of the equipment powered by the supply.



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## ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

**PRECISION | POWER | PERFORMANCE | TRUST**

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