

### L-828 / L-829 Constant Current Regulator



Fig. 1 10 KW Spirit Series CCR

### System Application

Ferroresonant CCRs are recommended for series circuits that have oscillating loads, where low output harmonic content is desired, or when used with powerline carrier control technology. Applications include:

- General aviation, commercial, and military airports operating in VFR to CAT IIIb visibility conditions.
- Runway and taxiway edge lighting, centerline lighting, signs, approach systems, PAPI, VASIS.
- Flashing loads including series-powered ALSF or SSALR strobes, ODALs, REILs, LAHSO, Runway Guard Lights.
- Surface Movement and Guidance Control Systems (SMGCS) using powerline carrier technology to control and monitor individual lamps or segments.

### Standards Compliance

- FAA Advisory Circular 150/5345-10F, June 24/05, Type L-828 and L-829.
- Transport Canada CCR Specification K290-2.
- Canadian Department of National Defence Standards.
- ICAO Aerodrome Design Manual Doc 9157, Part 5.

The Spirit Series™ Ferroresonant Constant Current Regulator (CCR) provides the benefits of our Freedom Series™ ferroresonant CCR in a more economical standalone package. With powerful control and monitoring capabilities, it is designed for airports operating from VFR to CAT III conditions. The Spirit Series™ CCR uses the same proven hardware and firmware used in our Freedom Series™ CCR and is a result of forty years experience in airfield lighting power and control solutions.

### Technology Benefits

- Digital control for precise waveform accuracy, high-speed response, and local data storage using Digital Signal Processor technology.
- Digital output accuracy and drift-free circuitry for increased lamp life.
- Digital operator interface provides full monitoring, diagnostics, and alarm indication. Dedicated status LEDs provide clear indication of warning and fault conditions.
- Membrane keys with tactile response provide maintenance personnel with access to all display values and configuration parameters.
- All ratings are dry-type and convection air-cooled. No cooling fans are required.
- All ratings can be stacked two units high to save floor space. Castors are also available.
- The CCR is equipped with over-current, open-circuit, over-voltage, input and output lightning protection. A safety interlock ensures power is disconnected when the door is opened.
- Ferroresonant design provides a stable output current that is not affected by flashing loads.
- True sine wave output provides high input power factor, low electromagnetic interference (EMI), low total harmonic distortion (THD) and excellent immunity to electrical transients and surges.
- All CCRs are user configurable, including selection of 1 to 5 brightness steps, output current adjustment, selection of monitoring features, operational parameters and alarm setpoints.
- User-configurable failsafe capabilities allow last state (latching) or preset brightness selection upon failure of control system.

### Ordering Information

**Type:**  
 FSF8 - Ferroresonant L828 Series  
 FSF9 - Ferroresonant L829 Series

**Construction:**  
 N - Non-switchgear (standalone)

**Output kW Rating:**

01 - 1 kW	07 - 7.5 kW	20 - 20 kW
02 - 2 kW	10 - 10 kW	25 - 25 kW
04 - 4 kW	15 - 15 kW	30 - 30 kW

**Class:**  
 A - 6.6 A Output      B - 20 A Output

**Input Voltage:**

1 - 208 VAC, 60 Hz	4 - 600 VAC, 60 Hz	7 - 380 VAC, 50 Hz
2 - 240 VAC, 60 Hz	5 - 220 VAC, 50 Hz	8 - 400 VAC, 50 Hz
3 - 480 VAC, 60 Hz	6 - 230 VAC, 50 Hz	9 - 220 VAC, 60 Hz

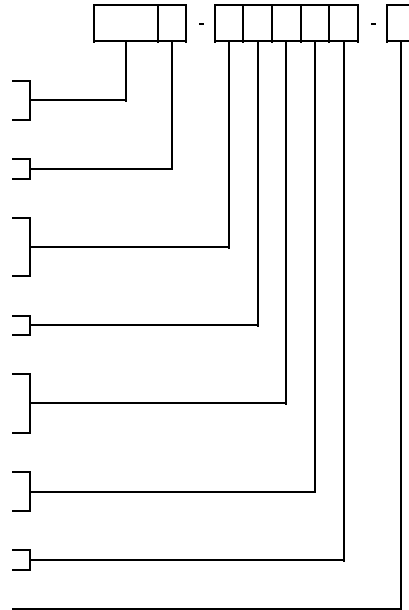
**Control Voltage:**

A - 24VDC Internal	C - 48VDC Internal	E - 120VAC Internal
B - 24VDC External	D - 48VDC External	F - 120VAC External

**Brightness Steps:**

1 - Single Step	3 - Three Step	5 - Five Step
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- Options (Select as Many as Required):**
- 02 - Integral Circuit Breaker
  - 22 - Internal Field Circuit (S1) Cutout
  - 23 - Insulation Resistance Monitor (Automatic Megger)
  - 25 - Output load taps (25% Increments)
  - 26 - Output Power Monitoring (voltage, VA, power, power factor)
  - 27 - Input Power Monitoring (current, voltage, VA, power, power factor)
  - 41 - Redundant Ethernet Network Interface
  - 42 - Redundant RS485 Network Interface
  - 43 - Single Ethernet Network Interface
  - 44 - Single RS485 Network Interface
  - 51 - Circuit Selector Control & Monitoring Interface (up to 4 external L-847)
  - 52 - Integral L-847 Circuit Selector (Direction Changer)
  - 53 - Integral L-847 Circuit Selector (2 Independent Circuits)
  - 93 - Stacking Kit
  - 94 - Castor Kit



kW Rating	CCR Weight (lbs)	Enclosure Size
1	205	24" w x 40" h x 24" d
2	230	
4	310	
7.5	430	
10	530	
15	780	36" w x 40" h x 30" d
20	940	
25	1045	
30	1215	

### Monitoring Capabilities

- Industry leading monitoring and diagnostics including analog output current, commanded and actual brightness step, elapsed time at each step, number of operations, warning and fault conditions including door interlock, local switch position, over current, over voltage or open circuit trips, communications or hardware failure.
- Available input and output power monitoring (current, voltage, VA, power, and power factor)
- Available L-829 monitoring functions including primary power, circuit trips, loss of VA, brightness within specifications, number of failed lamps per circuit with warning and alarm indication.
- Available insulation resistance monitoring (Automatic Megger) with alarm indications.
- Available fully redundant communication support using 100MB Ethernet (Ethernet/IP or Modbus TCP) or RS485 (Modbus or Allen-Bradley DF1).
- Redundant 24VDC backup power provides monitoring from the control system even during power failure to the CCR (included with communication options).
- Direct communication interface to Liberty *Freedom Series™* or *Spirit SE Series™* Airfield Lighting Control and Monitoring Systems.



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