

**RECTIFIER**  
**SEMICONDUCTOR TYPE-AUTOMATIC FERRORESONANT REGULATION**  
**24 VOLTS, 15 AMPERES**  
**EQUIPMENT DESIGN REQUIREMENTS**  
**POWER SYSTEMS**

**1. GENERAL**

**Scope**

**1.01** This specification, together with the supplementary information listed herein, covers the equipment design requirements for the engineering, manufacture and installation of a 24 volt, 15 ampere semiconductor-type ferroresonant regulated rectifier.

**1.02** This rectifier has been developed for use primarily in the 130 type and 105E power plants for charging 12-cell batteries of the lead-acid type. It may be used wherever its voltage, capacity and regulation characteristics meet the requirements and for charging 11-cell battery plants such as J86496.

**1.03** This rectifier has been designed to operate in ambient temperatures ranging from 0° C (32° F) to 50° C (120° F). In addition, it meets the general storage, shipping and handling criteria for customer premises communication equipment.

**Capacity**

**1.04** The input requirements are covered in Table A.

**1.05** *Output* characteristics are as follows:

- (a) **Rating:** 26V, 15 amperes.
- (b) **Regulation:** Approximately 1.0 percent for line, load, frequency and ambient temperature changes.
- (c) **Noise:** 32 dBnc (on 100 Ah battery).
- (d) **Heat Dissipation:** Approximately 85 watts.

**Description**

**1.06** *General Circuit Features:* This rectifier consists of a ferroresonant transformer with its associated ac capacitor, rectifying elements, filter capacitors, inductor, a bleeder resistor and a feedback control circuit as well as a high voltage shutdown circuit. The transformer provides an output regulated for ac line variations and it is magnetically shielded. The rectifying element employs two silicon diodes in a full-wave center-tap arrangement. An electronic control feature is provided to enhance the ferroresonant regulation. For 57 to 63 Hz and load variations, regulation is accomplished by an R-C integrator-triac control circuit operated from a feedback control circuit.

**TABLE A — AC INPUT DATA**

POWER SERVICE SINGLE-PHASE			RATED LOAD @ NOMINAL INPUT (120, 208 OR 240 VOLTS)				
VOLTS	Hz	AC LINE FUSE	CURRENT (AMP)	EFF %	PF %	WATTS	REACTIVE VOLTS AMPERES
105 - 129	60 ±3	7.5A	3.96	82	97	475	119
186 - 220	60 ±3	4A	2.28	82	97	475	119
215 - 253	60 ±3	4A	1.97	82	97	475	119

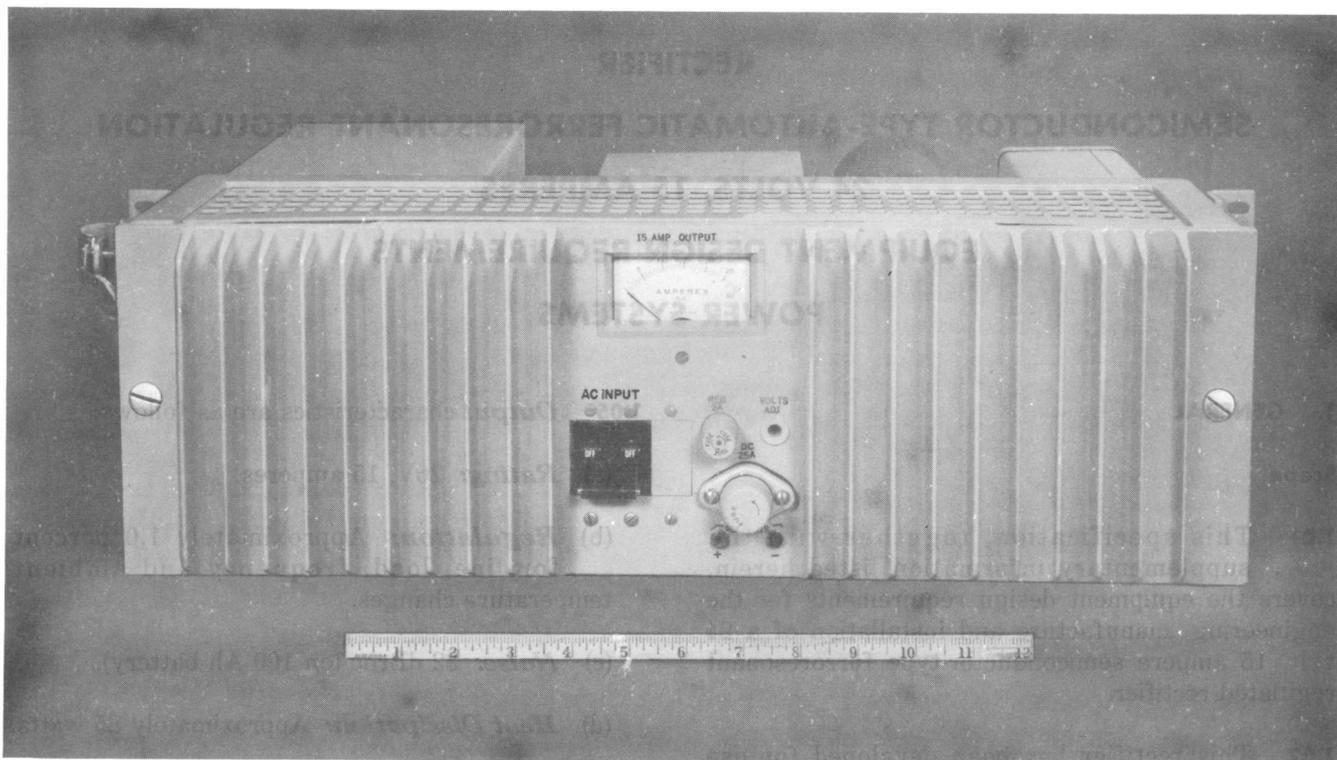


Fig. 1—J87328A, L1, Rectifier Front View

1.07 This rectifier is designed to operate on either commercial power supply with  $60 \pm 0.1$  Hz or stand-by generated power with  $60 \pm 3$  Hz.

1.08 **General Equipment Features:** The J87328A, L1 (Fig. 1) and L2 rectifiers consisting of components mounted on aluminum dished panels 7-inches high and 4.44-inches deep or designed to mount on 23-inch relay racks or in cabinets with similar mounting arrangements. The rectifiers are equipped with a hinged front cover for single side maintenance. The front cover is an aluminum casting having 10 vertical cooling fins,  $3/4$  inches high on  $3/4$  inch centers out front at each end of the panel. The cast cover functions as a heat sink for the rectifying diodes bridge, blocking diode and the triac associated with the control circuit feature. The overall front-to-back dimension for the unit is 12 inches. Control circuit components are provided inside the unit on a plug-in printed wire board assembly, ED-82427-30, G1 which is easily removed from the unit.

1.09 The ac service input cable enters through the left side of the unit and is terminated

on terminals on the transformer. The ac input is controlled by the circuit breaker.

1.10 A plug-in connector at the right side of the unit is used for dc output and control lead connections.

1.11 The rectifier has a 525A light gray enamel finish and weighs 70 pounds. Air circulation is by free convection.

## 2. SUPPLEMENTARY INFORMATION

- 802-000-000—Power System Index
- 800-020-020—Checking List—Equipment Design Requirements
- 800-600-000—Checking List—General Equipment Requirements
- 032-110-701—Electrolytic Capacitors—Aluminum Type—Requirements and Procedures
- 032-173-301—Diodes and Transistors—Procedures and Requirements
- 169-469-301—Maintenance Specification
- X-78251—Manufacturing Testing Requirements

**3. DRAWINGS**

WECO J drawings should be ordered by referring to the prefix and base number and requesting the current dash (-) number.

SD-82008-01—Rectifier—Semiconductor Type—Automatic Ferroresonant Regulation—24 Volts, 15 Amperes

J87328A-( )—Rectifier—Semiconductor Type—Automatic Ferroresonant Regulation—24 Volts, 15 Amperes Output

ED-82427-30—CP1—Control Unit PWB Assembly for J87328A, L1 and L2 Rectifier

**4. EQUIPMENT**

***J87328A—AT&T Co Std—Rectifier—Semiconductor Type—Automatic Ferroresonant Regulation—24 Volts, 15 Amperes Output***

Equipment—J87328A-( )

**List 1**—Framework, assembly, wiring, and equipment for one rectifier for 120-volt, 60-Hz power service.

	WIRE	EQUIP	NOTES
Control Unit, ED-82427-30, G1		1	C
Rectifier Circuit, SD-82008-01:			
Fig. 1, with X, Y, or Z Option	1	1	A, B & E

**List 2**—Framework, assembly, wiring, and equipment for one rectifier for 208/240-volt, 60-Hz power service.

	WIRE	EQUIP	NOTES
Control Unit, ED-82427-30, G1		1	C
Rectifier Circuit, SD-82008-01,			
Fig. 1, with S, T, W, Y, or Z Option	1	1	A, B, D&E

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**Notes**

- A. If this equipment is held in stock or otherwise out of service, the C1.1, C1.2 and C2 electrolytic capacitors shall be connected to a source of direct current of suitable voltage and polarity as covered in Section 032-110-701.
- B. The rectifier is normally assembled and wired with negative polarity. However, it may be wired for either positive or negative polarity. The "Y" option covers positive battery and negative ground. The "Z" option covers negative battery and positive ground. Ordering information should specify polarity required.
- C. The ED-82428-30 printed wiring board may be ordered separately as required.
- D. Unless otherwise specified this rectifier is wired for 240 volt, "W" and "T" options ac service. "W" and "S" options make provision for 208 volts ac service when required.
- E. This rectifier is normally provided with mounting brackets which place the front panel 4-3/16 inches from the mounting flange of the bay upright. When the rectifier is used in place of the J87211B rectifier different mounting brackets are required to locate the front 4-1/2 or 6-1/2 or 8-1/4 inches from the mounting flange of the bay upright. The appropriate mounting brackets may be ordered to place the rectifier in the desired location (See WECO manufacturing drawing).