8412-48 48 VDC (100 mA) Power Supply

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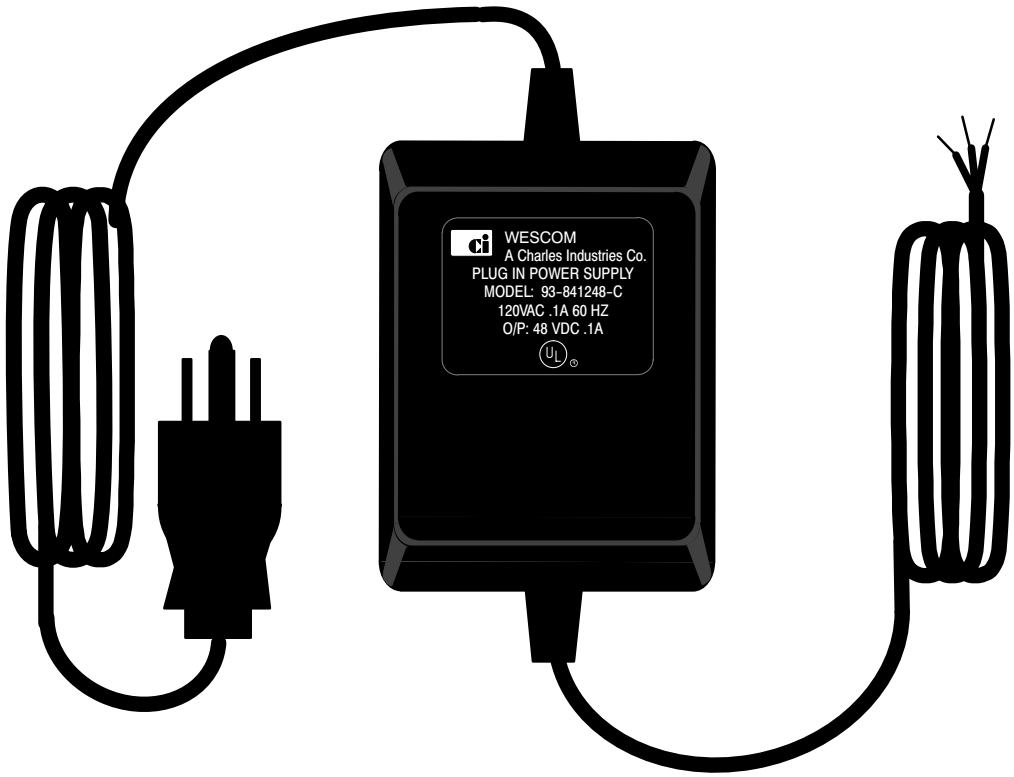

Figure 1. 8412-48 Power Supply, Top View

1. GENERAL

1.1 Document Purpose

This document provides information for the Charles Industries 8412-48 48 VDC (100 mA) Power Supply, shown in Figure 1.

1.2 Document Status

This document is reprinted to provide a general editorial update.

1.3 Equipment Function

The 8412-48 Power Supply unit provides a floating 48 VDC output at 0.10 A (maximum) for powering a limited amount of equipment at a subscriber location. The unit is powered from a standard 120 VAC, 60 Hz power line. Current limiting and current foldback are provided for short circuit protection of the DC supply.

1.4 Equipment Features

The 8412-48 offers the following features:

- Plugs into any convenient 120 VAC grounding-type receptacle
- Supplies regulated 48 VDC output at 100 mA
- Floating output permits grounding either polarity
- Series Regulator maintains constant 48 VDC output from no-load to 100 mA
- Foldback current regulation circuit prohibits output current from exceeding approximately 150 mA
- Crowbar circuit prohibits output voltage from exceeding 56 VDC
- UL Listed and complies with UL Standard 1310, Third Edition

CAUTION

Field repairs/modifications may void compliance with UL 1310 – Third Edition. Compliance with UL 1310 – Third Edition is restricted to inside plant wiring.

2. INSPECTION

2.1 Inspect for Damages

Inspect the equipment thoroughly upon delivery. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company.

2.2 Equipment Identification

Charles Industries' equipment is identified by a model and issue number imprinted on the front panel or located elsewhere on the equipment. Each time a major engineering design change is made on the equipment, the issue number is advanced by 1 and imprinted on subsequent units manufactured. Therefore, be sure to include both the model number and its issue number when making inquiries about the equipment.

3. APPLICATIONS

The 8412-48 is equipped with a 5-foot AC line cord that plugs into any standard 120 VAC, 60 Hz power source as provided by a wall-mounted receptacle having a ground plug provision.

The 8412-48 should be used only in 48 VDC applications that do not exceed a current drain of 0.10 A. Either the positive (+48) output or the negative (–48) output can be strapped to ground depending upon the application. The 8412-48 provides power to the equipment via a 6-foot output cord.

4. CIRCUIT DESCRIPTION

Refer to Figure 3, the 8412-48 Power Supply Block Diagram, while reading the following circuit description.

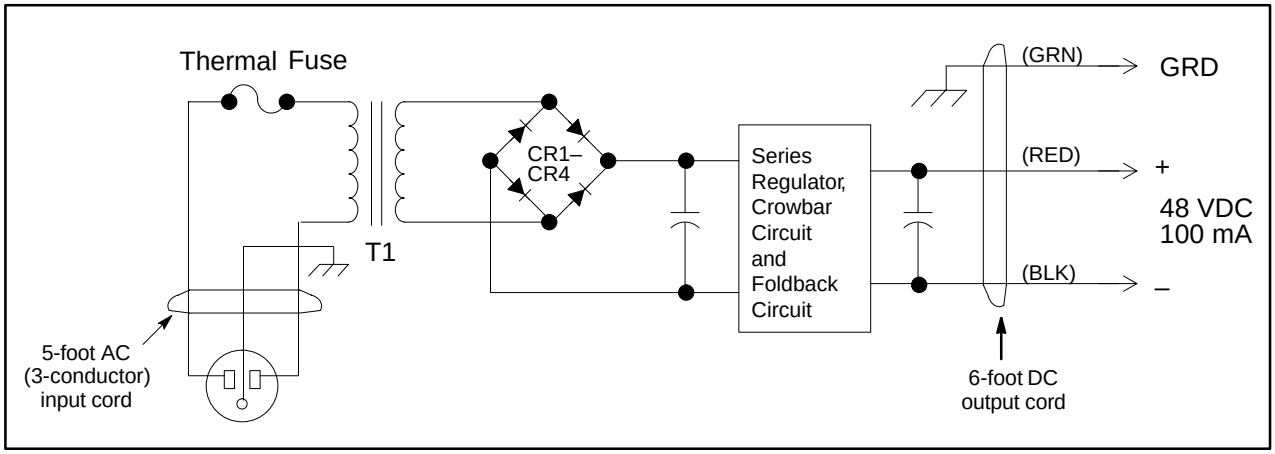

Figure 2. 8412-48 Power Supply Block Diagram

The input consists of a power transformer that is terminated to the AC line source through a thermal fuse. (In case of an internal failure, the thermal fuse permanently opens to prevent shock or fire hazard.) Transformer T1 has a secondary winding that provides power for the 48 VDC output and series regulator circuitry. T1 also provides isolation between the primary and secondary circuitry.

Diodes CR1 – CR4 and filter capacitor C1 supplies an unregulated filtered DC voltage to the series regulator.

The series regulator provides a constant 48 VDC with less than 30 mV of AC ripple from no load to 100 mA. The regulator monitors the output voltage and automatically increases or decreases the output to maintain a 48 VDC level. The output current is also monitored such that if it should exceed approximately 150 mA, the foldback circuitry reduces the output voltage and current, protecting the power supply.

If the output voltage attempts to exceed 56 VDC as a result of an internal malfunction or an external induced transient, the crowbar circuit will automatically trip and reduce the output voltage to zero, thus protecting both the equipment being powered and the power supply. The crowbar circuit will remain clamped in this tripped condition until the power supply is momentarily disconnected from the AC power source. This action resets the crowbar circuit for normal operation, unless the overvoltage is caused by a series regulator malfunction.

The current foldback circuit prohibits output currents greater than approximately 150 mA (max), as shown in Figure 3.

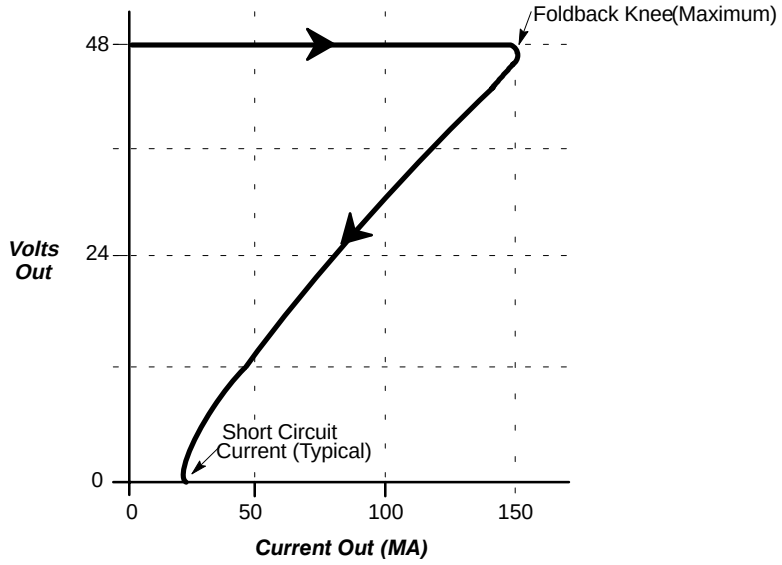

Figure 3. Typical Foldback Circuit Current Regulation

5. INSTALLER CONNECTIONS

Make all installer connections using the six-foot output cord supplied with the 8412-48. Refer to Figure 4 for the proper polarity and termination of the 48 VDC output.

Charles Industries telephony equipment uses negative battery (or positive ground) for proper operation. For –48 VDC, strap the GRD terminal to the + terminal of the 8412-48 and then connect the GRD terminal to the GRD connection of the equipment to be powered. Then connect the – terminal of the 8412-48 to the –48 VDC input of the equipment to be powered.

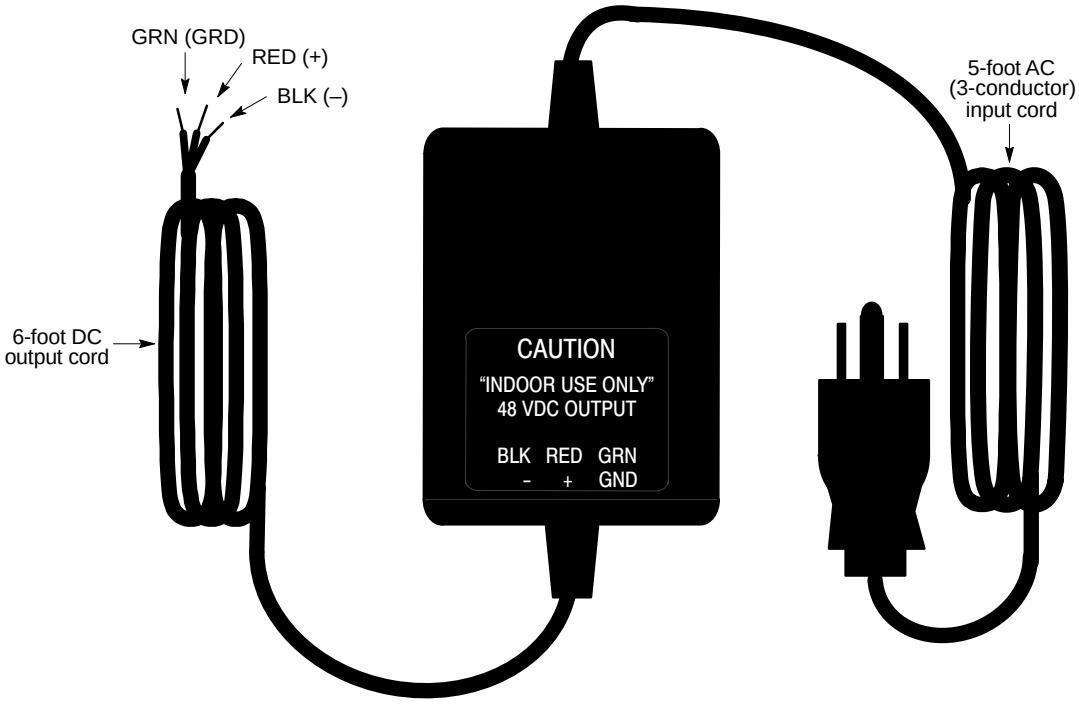

Figure 4. 8412-48 Power Supply, Back View

6. MOUNTING

Make all installer connections before attempting to mount the power supply. The 8412-48 can be placed on any flat, horizontal surface within 5 feet of an AC input receptacle and within 6 feet of the desired DC output device. The power supply is intended for installation in a protected environment. Do not expose to water.

After making all installer connections, insert the 8412-48 5-foot AC cord into a 3-prong grounded, nonswitched receptacle.

CAUTION

Do not expose to water. To prevent fire or electrical shock, connect directly to a grounding receptacle (3-prong). For commercial use only.

7. TESTING

If trouble is encountered with the 8412-48 Power Supply, verify that the voltage at the AC receptacle is between 105 and 129 VAC and that the power supply plug is firmly inserted into the AC receptacle. Verify that the output voltage of the DC power supply is 48 VDC $\pm$5 percent. If there is no output, momentarily interrupt the AC power and measure again.

8. TECHNICAL ASSISTANCE

8.1 Technical Assistance — U.S.

If technical assistance is required, contact Charles Industries' Technical Services Center at:

847–806–8500
847–806–8556 (FAX)
800–607–8500
techserv@charlesindustries.com (e-mail)

9. WARRANTY & CUSTOMER SERVICE

9.1 Warranty

Charles Industries, Ltd. offers an industry-leading, 5-year warranty on products manufactured by Charles Industries. Contact your local Sales Representative at the address or telephone numbers below for warranty details. The warranty provisions are subject to change without notice. The terms and conditions applicable to any specific sale of product shall be defined in the resulting sales contract.

Charles Industries, Ltd.
5600 Apollo Drive
Rolling Meadows, Illinois 60008–4049
847–806–6300 (Main Office)
847–806–6231 (FAX)

9.2 Field Repairs (In-Warranty Units)

Field repairs involving the replacement of components within a unit are not recommended and may void the warranty and compatibility with any applicable regulatory or agency requirements. If a unit needs repair, contact Charles Industries, Ltd. for replacement or repair instructions, or follow the *Repair Service Procedure* below.

9.3 Advanced Replacement Service (In-Warranty Units)

Charles Industries, Ltd. offers an "advanced replacement" service if a replacement unit is required as soon as possible. With this service, the unit will be shipped in the fastest manner consistent with the urgency of the situation. In most cases, there are no charges for in-warranty repairs, except for the transportation charges of the unit and for a testing and handling charge for units returned with no trouble found. Upon receipt of the advanced replacement unit, return the out-of-service unit in the carton in which the replacement was shipped, using the pre-addressed shipping label provided. Call your customer service representative at the telephone number above for more details.

9.4 Standard Repair and Replacement Service (Both In-Warranty and Out-Of-Warranty Units)

Charles Industries, Ltd. offers a standard repair or exchange service for units either in- or out-of-warranty. With this service, units may be shipped to Charles Industries for either repair and quality testing or exchanged for a replacement unit, as determined by Charles Industries. Follow the *Repair Service Procedure* below to return units and to secure a repair or replacement. A handling charge applies for equipment returned with no trouble found. To obtain more details of this service and a schedule of prices, contact the CI Service Center at 217–932–5288 (FAX 217–932–2943).

Repair Service Procedure

1. Prepare, complete, and enclose a purchase order in the box with the equipment to be returned.

2. Include the following information:

   – Company name and address
   – Contact name and phone number
   – Inventory of equipment being shipped
   – Particulars as to the nature of the failure
   – Return shipping address

3. Ship the equipment, purchase order, and above-listed information, transportation prepaid, to the service center address shown below.

   CI Service Center
   Route 40 East
   Casey, IL 62420–2054

4. Most repaired or replaced units will be returned within 30 or 45 days, depending on the product type and availability of repair parts. Repaired units are warranted for either 90 days from the date of repair or for the remaining unexpired portion of the original warranty, whichever is longer.

10. SPECIFICATIONS & APPROVALS

10.1 Electrical Specifications

The electrical characteristics of the 8412-48 are listed below. Physical specifications are listed in Table 1.

(a) INPUT VOLTAGE: 105 to 129 VAC, 60 ±1 Hz, single phase.

(b) DC OUTPUT: 48 VDC, ±5% over the input and load range.

(c) DC OUTPUT CURRENT: 0.10 A maximum.

(d) POLARITY: Floating, either side can be grounded.

(e) RIPPLE: 30 mV peak-to-peak maximum.

(f) FUSING: Thermal fuse at the input.

(g) SHORT CIRCUIT PROTECTION: Foldback CURRENT at approximately 150 mA maximum.

10.2 Physical Specifications

See Table 1 for the physical characteristics of the unit.

Table 1. Physical Specifications

Feature	U.S.	Metric
Height (not including cords)	3.2 inches	8.1 cm
Width	2.13 inches	5.4 cm
Depth	1.87 inches	4.76 cm
Weight	19 ounces	538.6 grams
Temperature	32 to 120°F	0 to 49°C
Humidity	To 90%	
Material	Black, high-impact-resistant thermoplastic	

10.3 Regulatory Approvals

The regulatory agency approvals of the 8412-48 are listed below.

(a) Complies with UL Standard 1310, third edition.