Installation Manual

Compact Circuit 56

Compact DC Power Family

Part. No. 281706

Doc. No. 2099195, Issue 1.2

Published 18-Nov-13

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Doc. No. 2099195, Issue 1.2, Nov. 2013

Published 18 November 2013

Table of Contents

Safety and Recommended Practices

For use in restricted-access locations only.
Suitable for mounting on concrete or other non-combustible surface only.

The Compact Circuit 56 DC Power Systems operate on an AC voltage between 100 V – 240 V and 50 – 60 Hz, and produce a regulated DC output of 42–56 V. See Table 4 on page 11 for DC output ratings.

WARNING: HAZARDOUS VOLTAGE AND ENERGY LEVELS CAN PRODUCE SERIOUS SHOCKS AND BURNS. Only authorized, qualified, and trained personnel should attempt to work on this equipment. The equipment is to be connected to supply mains by a qualified personal in accordance with local and national codes (e.g. NEC, CEC, etc). Refer to datasheets for full product specifications.

WARNING: For safety, the power supply is required to be reliably connected to PROTECTIVE GROUND. Do not disconnect and reconnect I/O power connectors during a lightning storm. Equipment meets GR-1089 Surge requirements and can be used for deployments where an external Surge Protective Device (SPD) is not utilized.

CAUTION: All rectifiers employ internal double pole/neutral fusing. Rectifier fuses are not field-replaceable.

Observe all local and national electrical, environmental, and workplace codes.

Each power shelf should be fed from a dedicated AC branch circuit of a terra neutral (TN) power system.

The plug end of an AC line cord is considered to be the primary disconnection means, and reasonable access must be given to the plug and receptacle area. The receptacle must be fed with a breaker or fuse according to NEC requirements.

For hard-wired AC connections, a readily accessible disconnection device must be incorporated in the building installation wiring. Select circuit breaker sizes according to national and local electric codes.

The output of the power supply is not intended to be accessible due to energy hazard.

Use Underwriters Laboratories (UL)-listed, double-hole lugs for all DC connections to prevent lug rotation and inadvertent contact with other circuits. Terminal strip connections require only single-hole lugs.

Use wire rated for 90°C for all DC connections. In practice, wires of a size larger than the minimum safe wire size are selected for loop voltage drop considerations.

It is recommended practice to ensure that all circuit breakers (including those for DC distribution) are in the OFF position during both installation and removal.

Alarm contacts are rated for a maximum voltage of 60 V, SELV (Safety Extra Low Voltage) and a maximum continuous current of 0.5A. Connection and mounting torque requirements are listed in Table 8.

Heat dissipation greater than the objectives listed in GR-63-CORE may occur. Additional equipment room cooling may be required. To cope with high heat release, aisle spacing may be increased and high heat-dissipating equipment may be located adjacent to equipment generating less heat.

Eltek does not recommend shipping the power shelf with rectifiers installed. Rectifiers should be shipped in separate boxes provided by Eltek.

Rack mounting must be performed in accordance with instruction provided by the manufacturer to avoid potential hazards.

FCC Compliance Statement

NOTE: The power system complies with Part 15 of Federal Communications Commission (FCC) Rules. Its operation is subject to the following two conditions:

- The system may not cause harmful interference.
- The system must accept any interference received, including interference that may cause undesired operation.

If the system causes harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the system and the receiver.
- Connect the system to an outlet of a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

WARNING: Changes or modifications to the system not expressly approved by the party responsible for the compliance could void the user's authority to operate the system.

1. Overview

The Compact DC power systems described in this manual both feature Eltek's DC distribution circuit #56. The "Q" shelf is designed for 23" shelves and can house up to four V-series rectifiers. The "I" shelf is designed for 19" shelves and can house up to three V-series rectifiers. Both shelves have a total depth of 12 inches. All cable connections—except for the bulk landings—are designed for front-side access. Bulk landings are top-access connections.

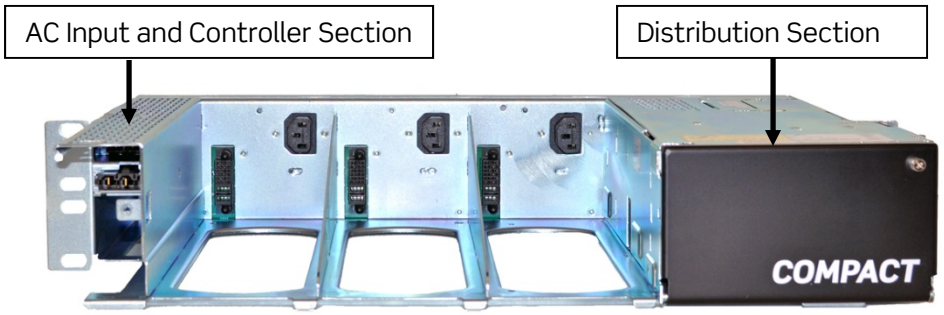


Figure 1 - CI56 Shelf

Figure 2 – CQ56 Shelf

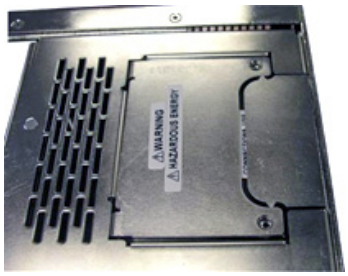


Figure 3 - Top-access Bulk Landing Cover

Rectifier Specifications

Rectifiers that work in Compact DC power systems are listed in Table 1. Specifications for each model are also given.

Table 1 - Rectifier Specifications

Model	Nominal DC Voltage (V DC)	DC Voltage (V DC) Range	Max DC Current (I DC)	Operating AC Voltage (V AC) Range
V0500A	48	42 - 56	10	90 - 264
V0750A	48	42 - 56	15	90 - 264
V1000A	48	42 - 56	20	90 - 264
V1250A	48	42 - 56	25	90 - 264
V1500A	48	42 - 56	30	180 - 264
V2000A	48	42 - 56	40	180 - 264
V2500A	48	42 - 56	50	180 - 264

Typical and maximum values of heat dissipation for Eltek rectifiers are listed in Table 2. "Typical" is calculated at AC 240 V and typical DC output voltage and current values. "Maximum" is calculated at minimum AC voltage (depends on rectifier) and maximum DC output voltage and current. A minimum of ¾" of space is required above and below Compact DC Power Systems for airflow.

NOTICE: Heat dissipation greater than the objectives listed in GR-63-CORE may occur. Additional equipment room cooling may be required. To cope with high heat release, aisle spacing may be increased and high heat-dissipating equipment may be located adjacent to equipment generating less heat.

NOTE: Values listed in the table are per rectifier rather than the sum of a fully-populated shelf.

Table 2 - Heat Dissipation

Model	Typical		Maximum	
48V Rectifiers	BTU/hr	Watts	BTU/hr	Watts
V0500A	180	53	281	82
V0750A	271	79	435	127
V1000A	361	106	563	165
V1250A	451	132	690	202
V1500A	541	159	844	247
V2000A	722	212	1100	322
V2500A	902	264	1355	397

AC Input

The Compact "Q" power shelf is available in either dual-feed or individual-feed AC input. The Compact "I" shelf is available in single-feed, dual-feed, or individual-feed AC input.

Single Feed

The single-feed input option is available for the "I" shelf (19" width) only. There is one Molex connector above the controller for AC input cable

connections. The feed powers all rectifier slots. There are three rectifier slots in the "I" shelf. Line cords are available for purchase from Eltek.

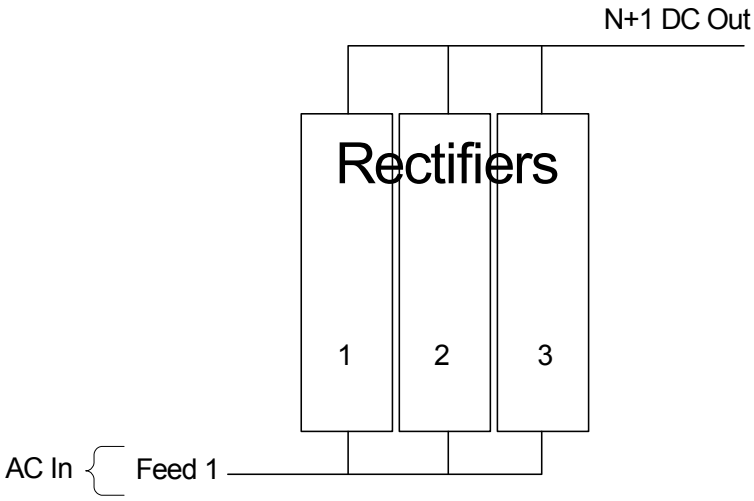


Figure 4 – Single Feed AC Wiring Architecture

Dual Feed

For dual-feed AC, there are two Molex connectors above the controller for AC input cable connections. Each feed powers two rectifier slots. In the "I" shelf (19" width), the second feed powers the second slot only, since there are only 3 rectifier slots. Line cords are available for purchase from Eltek.

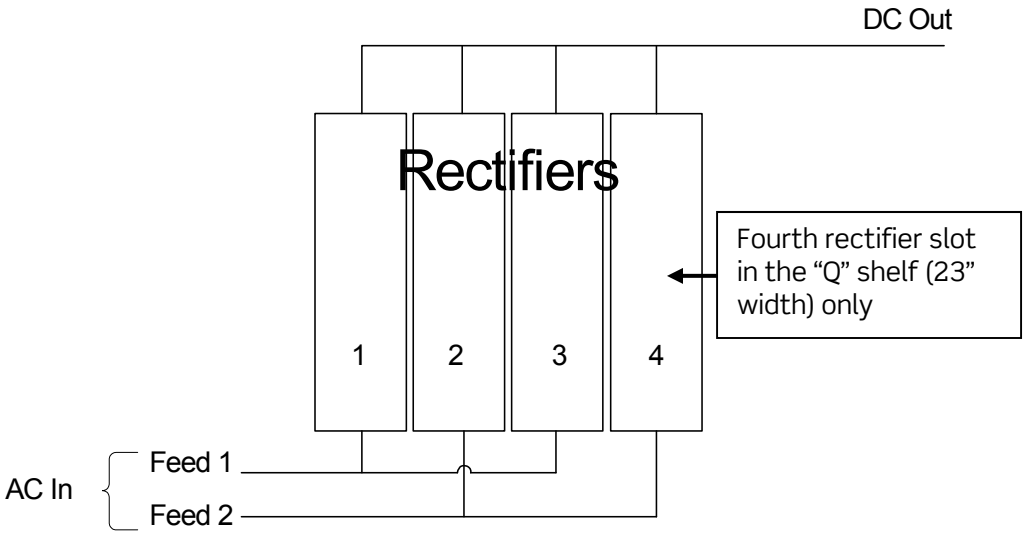


Figure 5 - Dual Feed AC Wiring Architecture

Individual Feed

For individual-feed, there are Molex connectors above the controller for AC input cable connections. Each feed powers one rectifier slot. Line cords are available for purchase from Eltek.

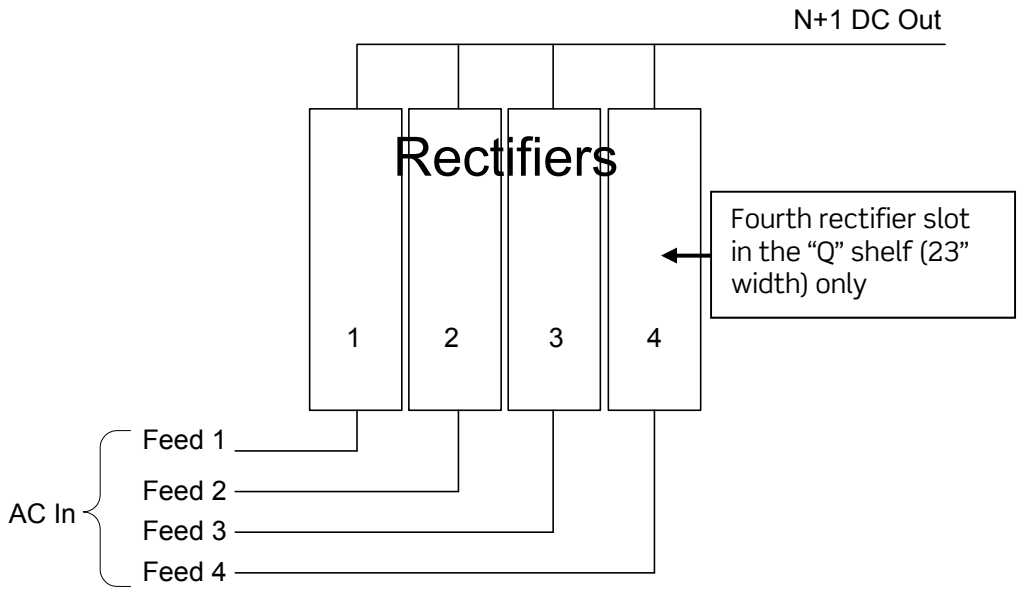


Figure 6 - Individual Feed AC Wiring Architecture

AC Feed Wire Sizing

To size AC feeds properly, follow the specifications in Table 3. **Failure to size the AC breaker and wiring properly can result in nuisance breaker trips or even fire.** If you anticipate growth, size the AC breaker and wiring for the expected capacity**. Always follow NEC (national electrical code) rules and local or company practices when selecting AC wires and protection devices.**

AC specifications listed in Table 3 are based on the absolute minimum input voltage at which the rectifiers will run. To calculate current draw for dual-feed AC input, simply multiply the current draw value in Table 3 by the number of rectifiers on the feed (two, in the case of dual-feed).

Table 3 - Rectifier Worst-case Current Draw

Model Number of Rectifier	Minimum Input Voltage	Maximum AC Current	Minimum circuit breaker
	Volts	Amps	Amps
V0500A	90	7.4	15
V0500A	180	3.7	15
V1000A[2]	90	14.6	15
V1000A	180	7.3	15
V1000A-HE[1]	90	13.0	15
V1000A-HE[1]	180	6.6	15
V1250A[2]	90	17.8	20
V1250A	180	9.1	15
V1500A	180	10.9	15
V2000A[2]	180	14.6	15

[1]HE is the high-efficiency line of rectifiers
[2]Select rectifiers based on 80% rule (current draw should not exceed 80% of terminal ampacity).

DC Output

Table 4 below lists the DC output ratings for each CI56 and CQ56 shelf.

Table 4 - DC Output Ratings by Shelf Code

Shelf Code*	Output Rating for Temperature Range:	
	-40°C to +40°C	+40°C to +65°C
CI56x-ANL-VC	150A	120A
CI56x-ANN-VCS	150A	120A
CI56x-ANN-VC	150A	150A
CQ56x-ANL-VC	200A	160A
CQ56x-ANN-VCS	200A	160A
CQ56x-ANN-VC	200A	200A

*The "x" in the shelf codes is a placeholder for the AC input type.

Circuit 56 contains ten (10) GMT fuse and four (4) breaker-protected output positions that are front accessible, as well as two (2) bulk outputs that are accessible from the top (near the rear of the shelf). Total maximum DC output is 150A for "I" shelves and 200A for "Q" shelves (which have one more rectifier slot than the "I" shelves). There are two circuit breaker positions that have an option for an in-line shunt and LVD.

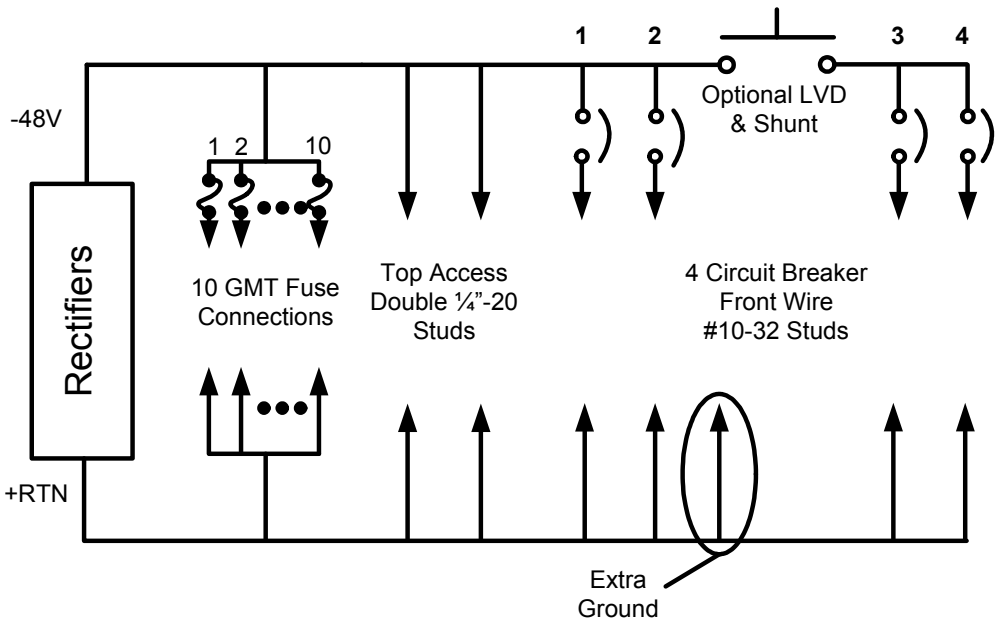


Figure 7 - Circuit 56 Diagram

Overcurrent protection devices for this system are UL-listed bullet-style breakers of up to 100 A and GMT fuses of up to 15 A.

NOTICE: Breakers must have isolated auxiliary contacts to maintain proper alarm polarity. It is recommended that breakers be purchased through Eltek.

GMT fuse connections are made on a compression-style terminal block. The maximum wire size for fuse connections is 12 AWG. Select wire sizes for each GMT fuse connection according to fuse current rating.

The four (4) circuit breaker positions have landings with #10-32 studs on 5/8" centers for two-hole lugs. The maximum tongue width for lugs is 0.55". Select wire sizes for each position according current rating. An extra landing for a two-hole lug is provided on the circuit breaker return bus. Use this extra connection to connect DC reference ground. The bottom two positions (3 and 4) have an optional inline LVD and shunt.

Bulk output consists of two landings per polarity with 1/4"-20 studs on 5/8" centers for two-hole lugs. The landings are located on the top side of the system, near the rear. The maximum tongue width for bulk connections is two (2) lugs at 0.55".

DC Output Wire Sizing

There are two main considerations for sizing a DC wire: ampacity and voltage drop. Ampacity refers to the safe current-carrying capacity of a wire as specified by such organizations as Underwriters Laboratories (UL) and the National Fire Protection Association (NFPA), which publishes the National Electrical Code (NEC). Voltage drop is the amount of voltage loss

in a length of a wire due to ohmic resistance of the conductor. A DC wire may be sized for either ampacity or voltage drop, depending on loop length and conductor heating. In general, for ampacity considerations, wires of length less than 50 feet are selected, and for voltage drop considerations, wires of length more than 50 feet are selected. The NEC provides ampacity values for various wire sizes, wire bundles, and insulation temperature–rated wires. **Always follow NEC rules and local company practices when selecting DC wires and protection devices.**

The size of wires for DC circuit breakers must be based on the breaker size rating. The size of wires for DC GMT fuses must be based on the GMT fuse size rating. The selection of unprotected DC output wires is based on the total rectifier capacity of the shelf.

DC Lug Requirements

Table 5 and Table 6 list lug part numbers that can be used for circuit breaker and bulk output connections. The part numbers are of lugs and ring terminals used with the flex conductor cable. Consider the type of wire and your company's requirements when determining the exact type of lug.

Table 5 lists the available lugs for use with the front-access circuit breaker output connections.

Table 5 - Lug Part Number for Circuit Breaker DC Output Connections

Wire size		Burndy Lug	Description
AWG	mm^2	Part number	
10	6	YAV102TC10	Double hole lug with #10 holes and 5/8" centers
8	10	YA8CL2TC10	Double hole lug with #10 holes and 5/8" centers
6	16	YAV6C-L2TC10-FX	Double hole lug with #10 holes and 5/8" centers
4	25	YAV4C-L2NT10-FX	Double hole lug with #10 holes and 5/8" centers

Table 6 lists the available lugs for use with the top-access bulk connections.

Table 6 - Lug Part Number for Bulk DC Output Connections

Wire size		Burndy Lug	Description
AWG	mm^2	Part number	
10	6	YAV102TC14	Double hole lug with 1/4" holes with 5/8" centers
8	10	YA8CL2TC14	Double hole lug with 1/4" holes with 5/8" centers
6	16	YAV6C-L2TC14-FX	Double hole lug with 1/4" holes with 5/8" centers
4	25	YAV4C-L2TC14-FX	Double hole lug with 1/4" holes with 5/8" centers

DC Reference Grounding

The Compact shelf is a floating system, which means that the return bus bar is not tied to the chassis or an earth ground. An external reference or earth ground may be connected to any return connection; the circuit breaker return bus has an extra landing for this purpose (two #10-32 studs on 5/8" center). Fuse, circuit breaker, and bulk return connections are tied together. Follow NEC, local, and company guidelines for sizing and attaching a reference ground.

Circuit Breakers

CAUTION: Circuit breakers (both load and battery) should be in the "OFF" position when installed in the system.

Circuit breakers (sold separately) are UL-listed bullet-nose style and install into the breaker connection points. Follow national, local, and company codes for sizing and installation. Breakers should be installed with the "line" bullet connector on the left and the "load" bullet connector on the right. "Line" and "Load" are labeled on a sticker on the side of the breaker (Figure 8). If circuit breakers supplied by Eltek are not used, the system requires agency-approved breakers with isolated auxiliary output connections. In addition, alarm contacts should short-circuit between the NC (normally closed) and C (common) connections in a tripped state.

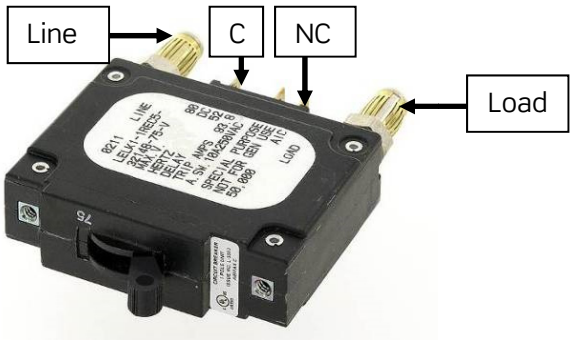


Figure 8 – Recommended Circuit Breaker

GMT Fuse Block

The GMT fuse block is rated for a maximum of 60A. Each fuse slot is rated for maximum fuse rating of 15A.

NOTICE: For loads larger than 6A per fuse, some fuse slots should be left unpopulated to provide adequate heat dissipation. See Table 7 for the recommended fuse position configurations for specific maximum loads per fuse circuit.

Fuse Block Position	Fuse Confugration for Load Current Up To...		
	6A per Fuse	10A per Fuse	12A per Fuse
1	FUSE	FUSE	FUSE
2	FUSE		
3	FUSE	FUSE	
4	FUSE		FUSE
5	FUSE	FUSE	
6	FUSE		
7	FUSE	FUSE	FUSE
8	FUSE		
9	FUSE	FUSE	
10	FUSE		FUSE

Table 7 - Recommended Fuse Configurations

As shown in Table 7, fuses may be installed in consecutive fuse slots for loads up to 6A per fuse. For loads up to 10A per fuse, one fuse slot should be left unpopulated between each fuse. For loads up to 12A per fuse, both slots on either side of each fuse should be left unpopulated.

NOTICE: It is recommended that current through a fuse or a circuit breaker not exceed 80% of the rated value of the fuse or circuit breaker. Do not connect loads to the GMT fuse block that will draw more than 12A per circuit (80% of the 15A rating per fuse slot).

GMT-style fuses should be installed into the fuse block with the indicator arm on the right side (see Figure 9).

Figure 9 - GMT-style Fuse

2. Installation

Before installing the power system the following safety requirements should be considered.

- **Elevated Operating Ambient:** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- **Reduced Air Flow:** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical Loading:** Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit Overloading:** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable Earthing:** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Torque Settings

Table 8 lists recommended torque settings for all mechanical and electrical connections according to screw or nut size.

Screw or Nut Size	Torque (in-lb)	Torque (ft-lb)
#10-32	21-31.2	--
#12-24	36-42	--
1/4"-20	--	4.25-11
Fuse Terminal	7.6-9.0	

Table 8 - Recommended Torque Settings

Required Tools

The power system is designed to be installed with a minimum number of commonly available tools.

- #1 and #2 Phillips screwdrivers
- Torque wrench
- 5/16” and 7/16” box wrenches, sockets, and nut drivers
- Wire and cable strippers
- Wire and cable crimpers

Site Preparation

Before unpacking the DC power system, note any physical package damage that could indicate potential damage to the contents. After removing the system from boxes and packing material, inspect for any shipping or other damage. Contact sales or technical support immediately if you notice any damage.

Have all tools, wires, cables, hardware, and so on within easy reach. To the extent possible, ensure a clean (free of debris, dust, and foreign material) work environment. Care should be taken during the installation process to prevent exposure of the equipment to wire clippings.

If possible, rectifiers should remained sealed in their shipping boxes until the shelf wiring is complete. **Ensure that all AC and DC power sources are off and disconnected.**

Mechanical Mounting

The system is intended for normal operations. The “Q” shelf is to be installed in a standard 23” telecommunications rack; the “I” shelf is to be installed in a standard 19” rack. Eltek recommends that one person hold the shelf in position in the rack while another person secures it to the rack by using the mounting hardware shipped with the system (#12-24 screws). For recommended torque settings, see Table 8. A minimum gap of 3/4” above and below the system is required for proper airflow.

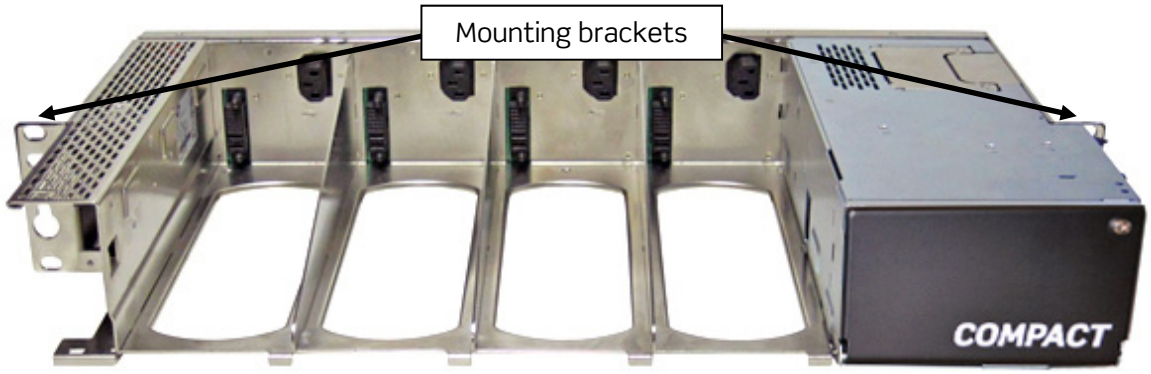


Figure 10 - Front View of CQ56 Shelf

Controller Connections

The BC2000 controller is designed for the Compact power system. Install the controller into the controller slot, which is on the left side of the shelf (see Figure 10). Only gentle force is required to fully install the controller module. If the controller does not mate with the backplane, simply withdraw the chassis, realign, and try again. For more information about peripheral connections, refer to document #2055882—*BC2000/JC2000 Display Manual*, which accompanies the controller. System controllers are sold separately.

CAUTION: Excessive force can bend or break the pins of the connector, permanently damaging the controller.

Figure 11 - BC2000 Controller

AC Input Connections

WARNING: Shock hazard! Make sure all power sources are off or deactivated before making electrical connections. AC mains should remain off until all electrical connections are terminated and verified.

Single-Feed AC

Make the AC cord connection to the Molex terminal above the controller. The connector feeds all rectifier slots.

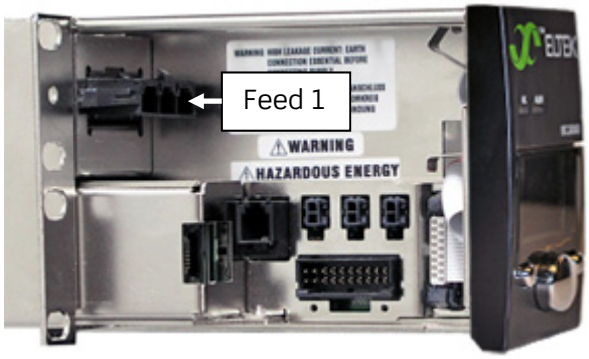


Figure 12 - AC Connections (Single Feed)

Dual-Feed AC

Make AC cord connections to the Molex terminals above the controller. The top connector feeds rectifier slots 1 and 3; the bottom connector feeds rectifier slots 2 and 4 (see Figure 5).

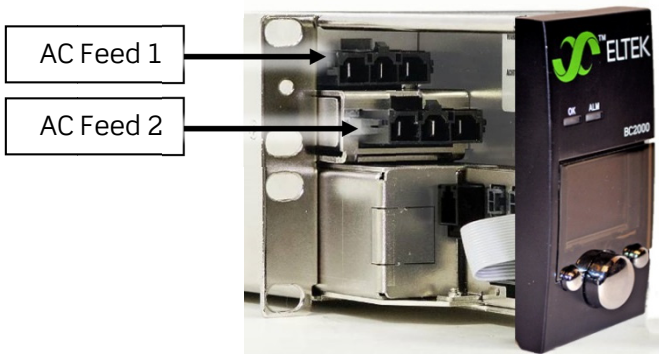


Figure 13 – Dual-feed AC Connectors

Individual-Feed AC

Make AC cord connections to the Molex terminals above the controller. Connectors are numbered left-to-right, with number 1 powering the leftmost rectifier in the shelf, and number 4 powering the rightmost rectifier slot.

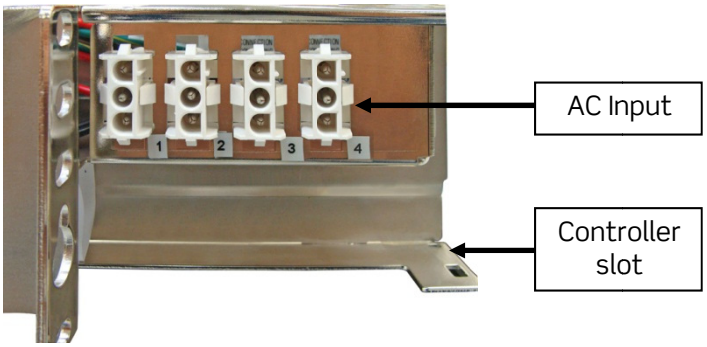


Figure 14 - AC Connections (Individual Feed)

DC Output Connections

WARNING: Verify the polarity of all shelf connections, as well as of batteries, before connecting batteries to the shelf. An improper connection can cause the system not to work properly, can damage the shelf, and may cause bodily harm. For continued protection against fire, replace a fuse with another of only same type and rating. Indicating fuses have exposed live parts. Use caution when replacing or servicing them.

CAUTION: Circuit breakers (both load and battery) should be in the "OFF" position when installed in the system.

NOTICE: Use the distribution label card—located on the door of the distribution section—to check fuse and breaker locations.

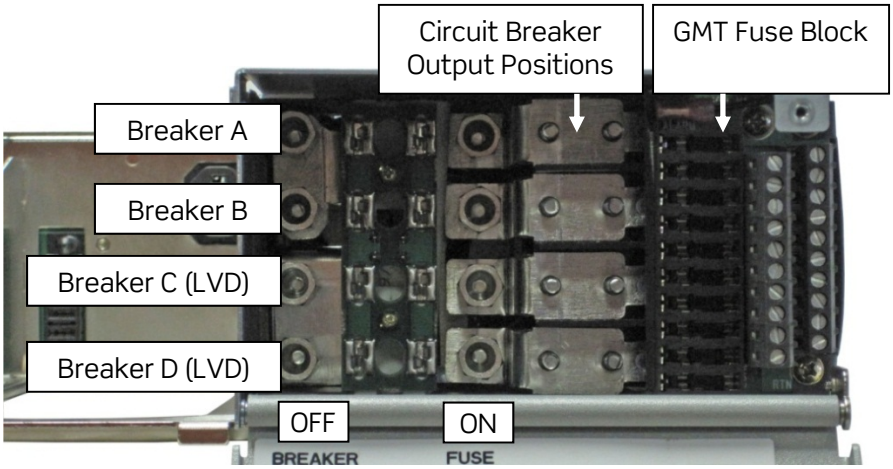


Figure 15 – DC Distribution (Front View)

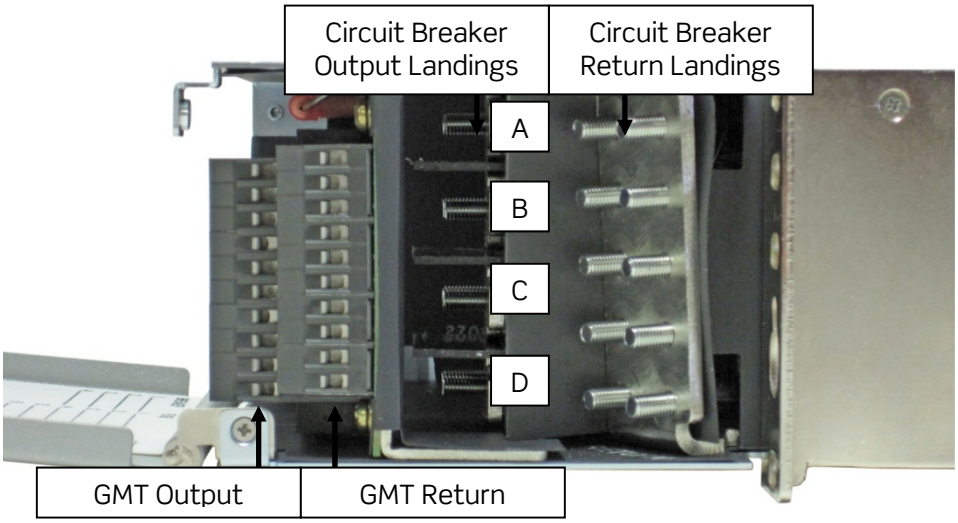
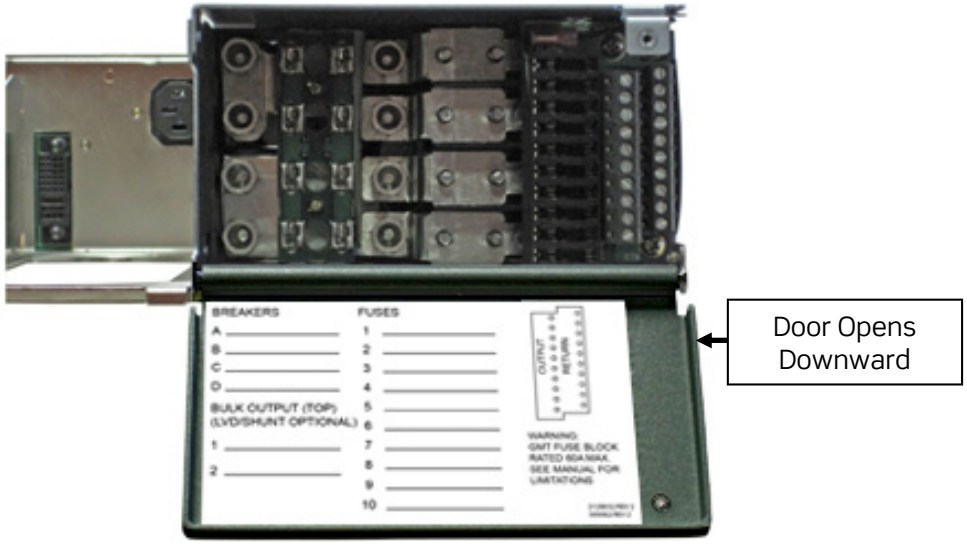


Figure 16 - DC Distribution (Side View)

To open the distribution door:

1. Use a small Philips screwdriver to loosen the captive screw holding the door in place. The door opens downward.



GMT Fuse Block

For GMT output and return connections:

1. Insert wire into open slot on the GMT terminal strip.
2. Use a small flat blade screwdriver to compress wire with the terminal screw. Use the recommended torque value in Table 8.
3. Install fuses into appropriate slots in the GMT fuse block as discussed in the section “GMT Fuse Block” (begins on page 14).
4. Record fuse positions on the label provided on the door.

Circuit Breakers

For circuit breaker connections:

1. Connect output cables to the connections labeled “circuit breaker output positions” in Figure 15. Use the recommended torque value in Table 8.
2. Connect the corresponding return cables to the connections labeled “circuit breaker return positions”. Use the recommended torque value in Table 8.
3. Plug in the bullet-nose circuit breakers as outlined in the section “Circuit Breaker” starting on page 14.
4. Record breaker designations on the label provided on the door.

Bulk Landings

For bulk landings:

1. **Verify polarity**, especially if connecting batteries!

2. Use a small Philips screwdriver to remove the two screws holding the top cover in place.

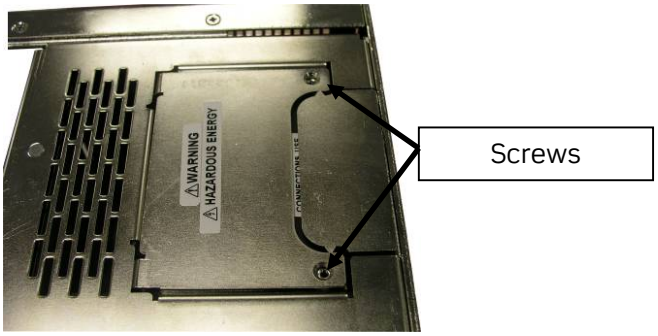


Figure 17 - Top Cover

3. Remove the cover to find the bulk landings.

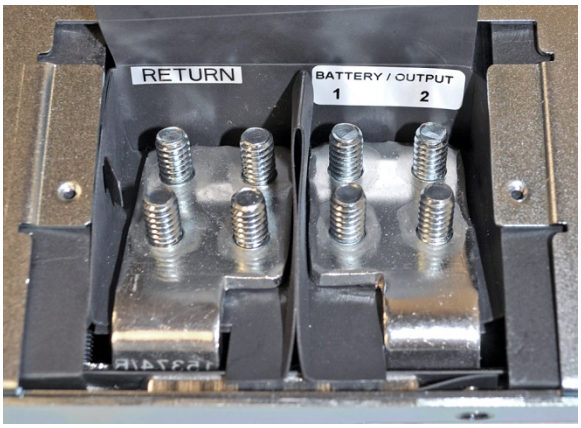


Figure 18 – Bulk Output Top View

4. Connect two-hole lugs with heat-shrink tubing to the output bus. Use the recommended torque value in Table 8.
5. Connect two-hole lugs with heat-shrink tubing to the return bus. Use the recommended torque value in Table 8.

6. Break off the cable access portion of the bulk landing cover (see Figure 19).

Figure 19 - Remove Cable Access Portion of Cover

7. Reinstall the cover using the two screws removed in step 2.

Figure 20 – Bulk Landing Cover Reinstalled

3. Turn-Up

To turn-up the *Compact* system:

1. After all input and output connections have been secured and checked, activate all input breakers.
2. When input breakers are on, install each rectifier sequentially by sliding the rectifier into position and closing the latch as shown in Figure 21. **Rectifier latches must be open for installation. Attempting to install rectifiers with latches closed can result in mechanical damage to the rectifiers and the shelf.**

   Rectifier fans start in high-speed mode and reduce speed according to the ambient and plant conditions within 10 seconds. As each rectifier is installed, the controller automatically identifies the new rectifier and reconfigures the system.
3. Activate all DC breakers in the system. Leaving DC breakers in the off position may cause a distribution alarm on the controller. In addition, if the system contains an LVD contactor there may be a system alarm for a short period of time until the LVD closes.
4. After all rectifiers have been installed, and if there are no alarms, the controller will display "System OK." (If there are alarms, refer to Section 5 for troubleshooting assistance.) At this time, make any adjustments to the default controller settings by following the instructions in the manual.
5. If no changes are necessary, the installation is complete.

NOTICE: If the optional LVD is installed, then the LVD alarm typically triggers upon turn-up. The alarm clears after the pre-programmed LVD reconnect time (typically 20 seconds) elapses. If there are no alarms, make any adjustments to the default controller settings by following the instructions in document #2055882—*BC2000/JC2000 Display Manual*, which accompanies the controller.

Figure 21 - Rectifier Insertion

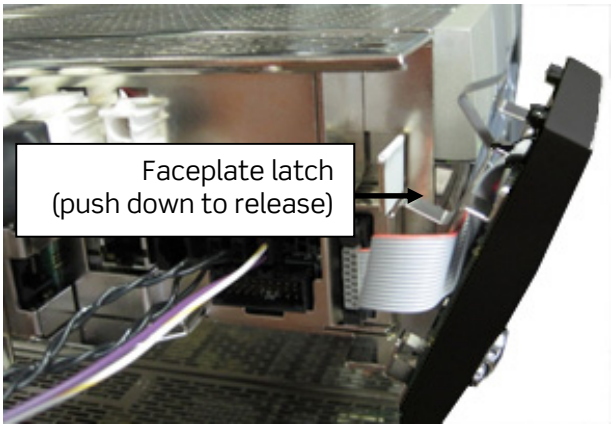
4. Replacement Items

The controller, LVD and shunt (optional), and rectifiers are designed as modular, field-replaceable units. The following sections outline the procedure to replace these items.

Controller

The controller can be replaced with the system powered. To replace a BC-series controller:

1. Unlatch the display by using the release on the backside of the faceplate, and remove it. The display is connected to the controller module by a ribbon cable (do not disconnect it).
2. Pull the controller module out of the shelf.



3. Align the replacement controller module and carefully insert it into the shelf. If it does not seat properly, partially withdraw the body and try again until it mates with the connector in the rear of the shelf.

CAUTION: Using excessive force may permanently damage the communication pins or the housing on the back of the controller.

Once properly seated, the controller turns on if the shelf is powered.

4. Install the display by hooking the bottom of the faceplate into the shelf and rocking the top back until the release snaps in place.
5. For settings and operation of a BC-series controller, see the document #2055882—*BC2000/JC2000 Display Manual*, which accompanies the controller.

Rectifiers

To replace a rectifier, perform the following steps:

1. Press the latch button on the front of the rectifier that needs to be removed, and pull the handle until the unit slides out of the slot.
2. Open the latch of the new rectifier, and slide the rectifier into the open slot until it connects with the backplane.
3. After the rectifier is inserted, close the latch by pressing it. The rectifier will power up and the controller will configure it automatically. No further setup procedure is required.

5. Troubleshooting

Problems and Solutions

In case of an alarm from the controller, verify the following (for details, refer to the Controller Installation and Operation manual):

- All AC and DC connections are secured properly.
- All rectifiers are installed and seated properly.
- The controller is installed and seated properly.

Follow these instructions for different scenarios:

- **AC OK off, DC OK off, ALM on or off, and display blank:** Verify that proper AC voltage has been supplied to the rectifiers being used. Refer to Table 1 for AC input voltage requirements. Reseat the rectifiers, and if problems continue, replace the rectifiers.
- **AC OK on, DC OK off, ALM LED on, and display blank:** Check DC output connections for any short circuit. Reseat the rectifiers, and if problems continue, replace the rectifiers.
- **AC OK on, DC OK on, and display blank:** For details about troubleshooting in this scenario, refer to the Controller Installation and Operation manual.

Short Circuit and Current Limit

Figure 22 represents the behavior of the output voltage in relation to the output current as load requirements exceed the I_{Limit} setpoint. I_{Limit} can be adjusted up to +105% of the rated current of the rectifier. The system output voltage will remain constant up to I_{Limit} at which point it will drop quickly to 0 V, as shown in Figure 22. If the output voltage drops below 12 V for more than 5 seconds, the system will shut down. The system will automatically restart after 60 seconds, and will continue to restart and shut down until the short circuit is cleared.

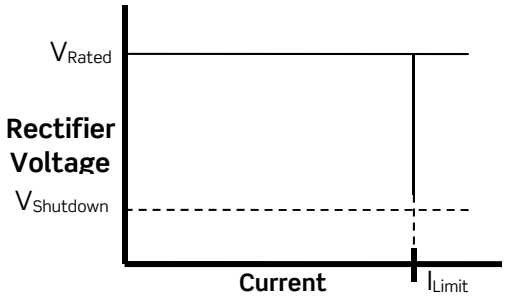


Figure 22 - Current Limit Graph

6. Installationsanleitung (German)

Eingangsspannung (Voltage):

Netzteile fuer (100 V – 240 V)	Netzteile fuer (200 V – 240 V)
V500A	V1500A
V750A	V2000A
V1000A	V2500A
V1250A	

Eingangsstrom (Current): 15 A

Eingangsleistung (Watts): 3000

Nennfrequenz (Frequency): 50/60 Hz

Modellnummer (Model No.): CQ56x-xxx / CI56X-xxx

Abmessungen sind nur zur Referenz (Dimensions are for reference only.):

- Depth: 12”/30.8 cm (front access with front wire)
- Depth: 15”/38.1 cm (front access with rear wire)
- Height: 3.45”/87.6 cm
- Width: 21.45” (std. 23”)/54.5 cm or 17.45” (std. 19”)/44.3 cm

Max. Umgebungstemperatur: V2000A rectifier, full power: 62 °C/Vollast (Max operation temperature)

Ausgangsspannungen und –stöme 54 V, max 200A (CQ56x), max 150A (CI56x) (output voltage and current)

- Das Gerät darf nur in Räumen mit beschränktem Zutritt aufgestellt werden. (Nur ausgebildetes Personal) Restricted access locations only.
- Das Gerät muß mindestens mit einer Anschlußleitung 4 x mm oder 5 x mm versehen sein. (Minimum wire sizes)
- Das Gerät hat keinen eigenen Ausschalter, es muß daher mit einem Ein- und Ausschalter im Versorgungskreis versehen sein. No mains ON/OFF switch is provided; disconnection means must be provided in the end-installation.
- Das Gerät hat kein Brandschutzgehäuse es darf daher nur auf nicht brennbaren Untergrund aufgestellt werden. (Beton, Metall usw.) The unit must be installed on non-combustible flooring.
- Beim Aufstellen des Gerätes ist daraf zu achten das alle Anforderungen gemäß EN60950 eingehalten werden. Installation must comply with EN60950.

7. Revision Table

Revision	Release	Description	CO
1	03/30/11	First release.	NA
1.1	06/18/12	Correct statements about AC line cords; they are NOT provided and must be ordered separately.	120510UA
1.2	11/18/13	Updated breaker labels, photos of bulk landings and BC2000 controller face.	130927UA

Doc. No. 2099195, Issue 1.2
Published 18-Nov-13

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