

BLC Series Breaker Landing Cabinet

600VDC, 1600-3000A Models

Installation and Operation Manual

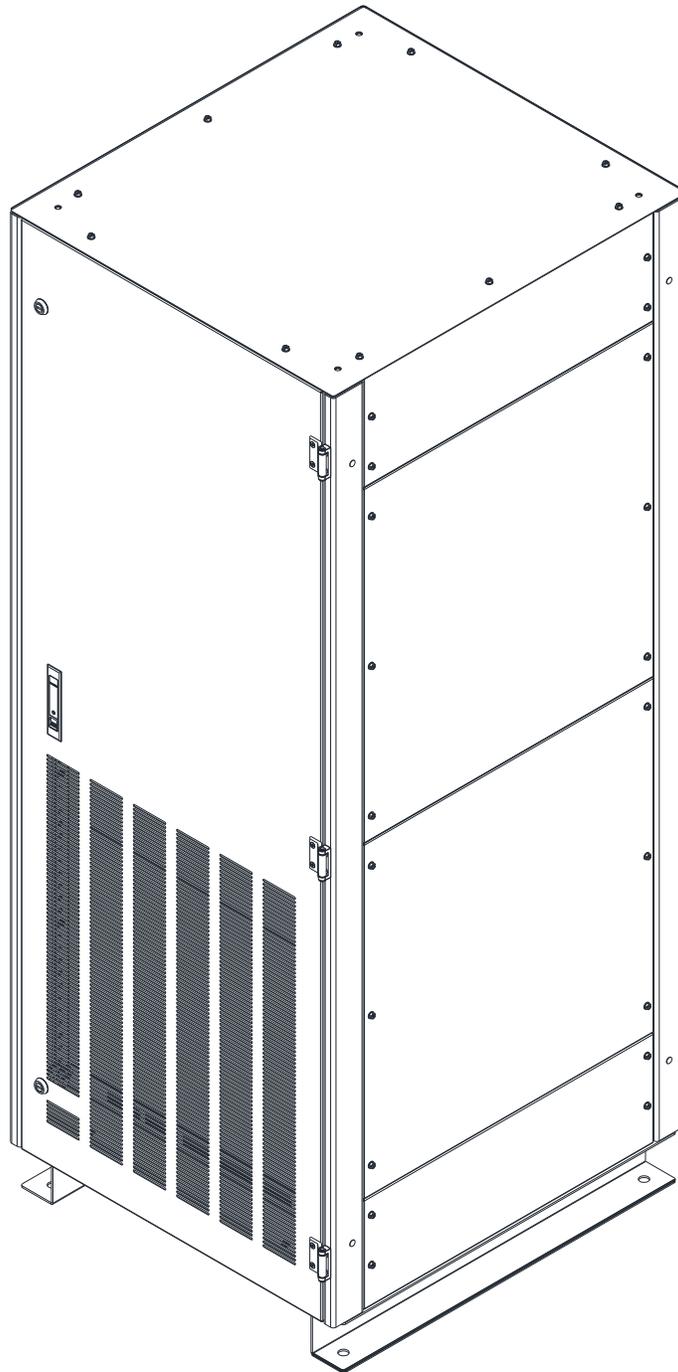


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1. IMPORTANT INFORMATION ABOUT THIS MANUAL

SAVE THESE INSTRUCTIONS! This manual contains important information that is needed during the installation and maintenance of the equipment.

1.1 MANUAL SYMBOLS



Warning:

Indicates information provided to protect the user against personal injury, safety hazards, and/or possible equipment damage.



Electrical Hazard

Indicates that an electrical hazard exists that will result in personal injury or death if instructions are not followed.



Important:

Indicates information provided as an installation or operating instruction or tip as well as general important installation and equipment information.

2. SAFETY PRECAUTIONS



Before installing or maintaining this equipment, it is extremely important to read this manual and be sure that all equipment drawings and schematics are reviewed and clearly understood. If there are any questions concerning this manual or any of the installation or maintenance procedures and/or requirements please contact your system provider before proceeding.



Information in this manual is not intended for use as a training manual for non-qualified personnel.



When installing this equipment always follow all applicable federal, state and local regulations to insure safe and proper equipment installation.



Only qualified persons should attempt to install or service this equipment. A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training on the hazards involved.



Do not attempt to unpack or move the equipment without assistance. Lift the equipment from the bottom only. Wear safety shoes when handling the equipment.



Equipment installation and maintenance should always be performed with heavily insulated tools. It is also recommended to wear rubber gloves and boots and to use insulating mats to stand on when working on this equipment.



Always wear eye protection when installing or maintaining power equipment.



To avoid personal injury including electrical shock, severe burns and possible death, all jewelry including bracelets, rings and watches must be removed prior to installing or servicing this equipment.



For the safety of others, never leave an open cabinet or panel unattended.



Any modifications to the equipment without authorization by your system provider could result in equipment damage, personal injury, or death.



Do not smoke or present open flames near any battery system.



Do not open or mutilate batteries. Open or severely damaged batteries can release toxic electrolyte which is harmful to the skin and eyes.



Never lay loose cables, metal parts or tools on top of batteries.



Never work on power equipment while it is energized. De-energize equipment and lock off all power to the equipment before working inside!



Inspection and maintenance should only be performed on equipment that has been de-energized and electrically isolated so that no accidental contact can be made with energized parts.

3. INSPECTION UPON RECEIPT OF GOODS

3.1 GENERAL

Special precautions and care have been taken to ensure the equipment arrives safe and undamaged. However, upon receipt, you should inspect the entire shipment, including the crate and any boxes for evidence of damage that may have occurred during transit.

3.2 VISIBLE DAMAGE

It is the responsibility of the person receiving the shipment to inventory and fully inspect all materials against the bill of lading or weigh bill IMMEDIATELY while the carrier representative is still present. Insure that all items are accounted for, including number of skids and quantity of boxes. Also note any visible external damage that may have occurred during transit. Make all applicable notations on the delivery receipt before signing and file a damage report with the carrier.

3.3 CONCEALED DAMAGE

Within 3 to 30 days of receipt (depending on courier), unpack the equipment and check for any concealed damage. Check the materials received against the detailed packing list to verify the quantity and the condition as complete and satisfactory.

Note any damage to the internal packaging, then request an inspection by the carrier and file a concealed damage claim. If there is a material shortage, contact your system provider to file a claim.

Please contact your shipping company for all shipping damage.

3.4 RETURN OF DAMAGED GOODS

Should equipment be damaged and require return for repair, a representative will provide instructions along with an RMA number to expedite the return.

A RMA number must be obtained before returning equipment.

4. OVERVIEW

The BLC Series DC Breaker Landing Cabinet allows for multiple battery strings to be terminated to a common bus protected by a DC rated molded case circuit breaker. This isolates the battery strings from the UPS for safety purposes and to provide ease of maintenance on either the battery strings or the UPS.

The BLC Series are available with current capacities ranging from 1600 to 3000 Amperes up to 600VDC.

The circuit breakers are available with the following optional accessories:

- Auxiliary Switch: For applications requiring remote on or off indication. Each auxiliary switch comprises of an open, closed, and common contact.
- Bell Alarm: The bell alarm switch is closed when the circuit breaker has been tripped due to short circuit, shunt trip, or under voltage trip. The bell alarm switch is automatically opened when the circuit breaker is reset.
- Shunt Trip: Circuit breakers may be tripped from a remote location with the use of a shunt trip. Shunt trips can be activated by applying a specified voltage through the shunt trip contacts which automatically cause the circuit breaker to trip.
- Under voltage (UV) Trip: The UV trip monitors a voltage across a set of contacts. If the voltage drops to a value below 35% of the specified coil rating, the under voltage trip device trips the circuit breaker. The operation is instantaneous and the circuit breaker cannot be reset until the voltage returns to at least 85% of the specified coil voltage.

5. SPECIFICATIONS



Always refer to the Ratings Label on the equipment for configuration specific ratings. Equipment specifications and ratings in this document represent typical equipment and may vary from the equipment provided.

5.1 ELECTRICAL

Voltage: 600VDC, 1-Phase, 2-Wire, plus ground

Current: models available from 1600A to 3000A

Short Circuit Rating: models available from 65kAIC @ 600VDC

5.2 ENVIRONMENTAL

Operating Temperature: 0°C to 40°C (32° F to 104° F)

Relative Humidity: 5% to 95% non-condensing

Altitude: 0 to 7400 feet above sea level

5.3 GENERAL

Cabinet Sizes & Weights:

30"W x 29.5"D x 78.7"H, 645 lbs.

30"W x 32.8"D x 78.7"H, 665 lbs.

30"W x 32.8"D x 82"H, 680 lbs.

30"W x 32.8"D x 84"H, 685 lbs.

6. PREPARATION

6.1 INSPECTION

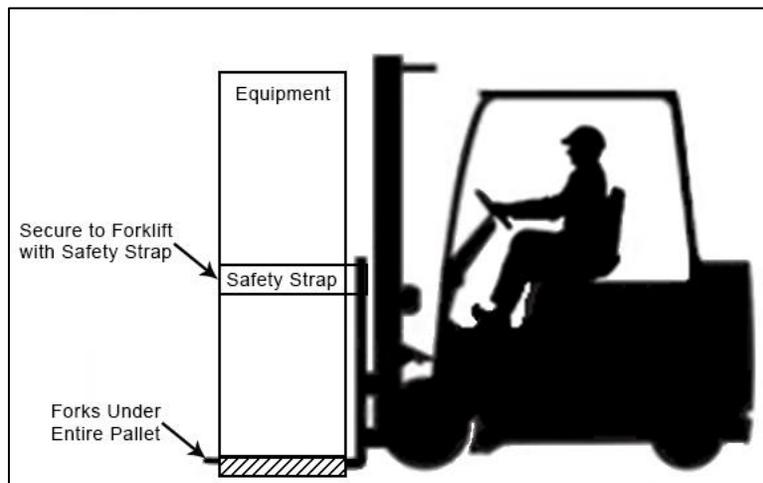
Remove the equipment from the packaging material and inspect for any shipping damage that may have been overlooked upon receipt of goods. Retain the packaging material for equipment storage or return shipment if necessary.

6.2 HANDLING



Do not attempt to unpack or move the equipment without assistance. Lift the equipment from the bottom only. Wear safety shoes when handling the equipment.

The equipment should remain attached to its shipping pallet until it has been moved to its final installation position. A forklift may be used for handling the equipment. Verify that the forklift load and lifting ratings are within safe limits for the weight of the equipment being lifted. The forks should extend through the entire length of the shipping pallet and should be spread to the widest position allowable. It is recommended to secure the equipment to the forklift with a safety strap. Carefully position the strap to ensure stability of the equipment and confirm that it is not in an area that will damage equipment components. Slowly lift the equipment to the minimum height from the floor required to safely move the equipment.



6.3 STORAGE

If the equipment cannot be immediately installed it should be stored in an upright position in a clean and dry indoor location with adequate air circulation and uniform temperature to prevent condensation. If the equipment must be stored for any length of time it should be covered to protect from dust, debris, and moisture.

7. INSTALLATION



Before installing or maintaining this equipment, it is extremely important to read this manual and be sure that all equipment drawings and schematics are reviewed and clearly understood. If there are any questions concerning this manual or any of the installation or maintenance procedures and/or requirements please contact your system provider before proceeding.

7.1 LOCATION



This equipment is intended to be installed in a restricted access location.

The permanent location of the equipment must be on a smooth, solid, and level foundation. Installation on an uneven foundation may cause misalignment of doors and other parts. Prior to installation verify that the selected location has sufficient floor load capacity to support the weight of the equipment. Also verify that the selected location will provide working clearances in compliance with article 110.26 of the National Electrical Code (NEC).

Environmental conditions of the selected location should also be reviewed. Refer to the Specifications section of this manual for environmental specifications. The equipment has ventilation openings located at the front and rear of the equipment. The equipment has to be installed in an area that has no obstructions that will prevent the free circulation of air through the front and back of the equipment. A minimum rear clearance of 2 inches is recommended for optimal cooling of the equipment.

7.2 MOUNTING

Remove the shipping pallet and all packing material and stand the equipment in an upright position. Install appropriately sized anchor bolts into the floor material. A set of drawings for the specific configuration of the equipment is included inside the documentation sleeve located inside of the equipment door. Reference the equipment drawings for mounting hole size and location.

Place the equipment in an upright position on the floor with the mounting holes intersecting the preset vertical anchor bolts. Secure the equipment to the anchor bolts with the appropriate hardware. Torque the anchor bolt hardware to manufacturer's specifications.

7.3 ELECTRICAL CONNECTIONS



Never work on power equipment while it is energized. De-energize equipment and lock off all power to the equipment before working inside!

A set of drawings for the specific configuration of the equipment is included inside the documentation sleeve located inside of the equipment door. Reference the equipment drawings to locate the designated cable entry areas of the equipment. All conduits must be located to avoid interference with structural members and live bus.



All conductors are to be sized for 75°C (167°F) ampacity. When cable is used with temperature ratings above 75°C it shall be sized based on the ampacity of cable rated 75°C.



The equipment must be grounded with the appropriately sized conductor in accordance with Article 250 of the National Electrical Code (NEC). The ground conductor should be terminated to the main ground bus bar inside the equipment.

Remove the equipment covers as needed to access the input and output connection points. When pulling cable into the equipment take care not to damage any of the internal components and control wiring. Position the cables inside of the equipment so they are not subject to physical damage and are not forced permanently against the edges of any metal parts. If any cables are in contact with sharp edges place suitable protective material between the cable and the metal edge to protect the cable insulation.

The equipment is provided with bus bars configured for cables with two hole compression lugs. Each bus bar is provided with six two hole lug landings on 1-3/4" centers that accept Ø 1/2" bolts. Lugs with a maximum tang width of 2-1/2" can be terminated back to back for a maximum of 12 cables per bus bar. Terminate the cables to the appropriate bus bars using the provided Ø1/2" hardware and torque to 50 ft-lbs.

Reference the Equipment Schematic Drawing for information on the required connections between the battery strings and the UPS.

8. PRE-ENERGIZING INSPECTION



Inspection and maintenance should only be performed on equipment that has been de-energized and electrically isolated so that no accidental contact can be made with energized parts.

Before energizing the equipment it must be thoroughly inspected.

1. Remove any foreign materials from inside of the equipment including tools, scraps of wire, or other debris.
2. Visually inspect the equipment for any damage that may have occurred during the installation process. Be sure to inspect all insulators, busbars, and other conductors. Do not energize if any damage is found!
3. Verify cable phase/polarity orientation at all connection points.
4. Verify that all field cable connections are properly torqued.
5. Verify the circuit breaker trip unit adjustments are set per the end user requirements.
6. Verify equipment ground connections are properly terminated.
7. Verify that all covers are installed.

9. ENERGIZING



Hazardous voltages in electrical equipment can cause severe injury or death!



Only qualified persons should attempt to install or service this equipment. A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training on the hazards involved.



Maximum continuous loads not to exceed 80% of the overcurrent protective device (circuit breaker and fuses) ratings employed in other than motor circuits, except for those circuits employing circuit breakers marked as suitable for continuous operation at 100% of their ratings.



Les charges continues maximales pour les dérivationes ne doivent pas être supérieures à 80 percent du courant nominal des disjoncteurs utilisés pour des circuits autres que des circuits de moteur. Toutefois, cette mesure ne s'applique pas aux circuits munis de disjoncteurs convenant pour service continu à 100 percent de leurs caractéristiques nominales.

Extreme hazards can exist when energizing electrical equipment. Take all precautions necessary to protect people and property when energizing this equipment. Before energizing the equipment Open/Turn-Off the circuit breaker. Refer to the UPS manual for proper startup procedures.

10. MAINTENANCE



Before installing or maintaining this equipment, it is extremely important to read this manual and be sure that all equipment drawings and schematics are reviewed and clearly understood. If there are any questions concerning this manual or any of the installation or maintenance procedures and/or requirements please contact your system provider before proceeding.



Inspection and maintenance should only be performed on equipment that has been de-energized and electrically isolated so that no accidental contact can be made with energized parts.

10.1 SHORT CIRCUITS AND OVERLOADS



Do not attempt to re-energize a circuit breaker after a short circuit or overload until the cause of the event has been identified and corrected. Failure to correct the cause of the event may result in equipment damage, fire, severe injury or death!

Circuit breakers will normally prevent electrical damage except at the point where the short circuit occurred. High mechanical stress developed by short circuit currents may cause damage to conductors, insulation, or other components. After a fault, thorough inspection of the entire system must be made to verify that there is no damage.

Circuit breakers which performed the short circuit interruption must be inspected for possible damage. Do not disassemble the breaker or open the breaker trip unit.

Replace all damaged insulation materials, conductors, and circuit breakers. It is recommended that the equipment be hi-pot tested prior to being placed back in service.

11. REFERENCE MATERIALS

Torque Values For Mechanical Lug Connections	
Slotted Head Terminals	
Wire Size	Torque Value
10-14 AWG	35 in-lbs. (3.9 Nm)
8 AWG	40 in-lbs. (4.5 Nm)
4-6 AWG	45 in-lbs. (5.1 Nm)
3-1/0 AWG	50 in-lbs. (5.6 Nm)
Socket Head Terminals	
Hex Size	Torque Value
3/16 in.	120 in-lbs. (13.6 Nm)
5/16 in.	275 in-lbs. (31.1 Nm)
3/8 in.	375 in-lbs. (42.4 Nm)
1/2 in.	500 in-lbs. (56.5 Nm)
Torque Values For Bus Bar Connections	
Bolt Size	Torque Value
#8	20 in-lbs. (2.2 Nm)
#10	30 in-lbs. (3.4 Nm)
1/4 in.	68 in-lbs. (7.7 Nm)
5/16 in.	10 ft-lbs. (13.6 Nm)
3/8 in.	20 ft-lbs. (27.1 Nm)
1/2 in.	50 ft-lbs. (67.8 Nm)

