Outdoor PowerRACK™

Up to 1600A User Manual

c UL us LISTED

LM-ODR - Rev.000

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Important

This manual contains information critical to the proper operation of the Lex Products Outdoor PowerRACK™. Be certain to read and understand all instructions prior to installation and operation.

Note: This manual is furnished exclusively to support installation and operation of the Lex Products Outdoor PowerRACK. All concepts and ideas are the sole property of Lex Products and are not to be duplicated or utilized in any manner without written permission.

TECHNICAL SUPPORT

Lex Products is available to help answer any installation or operation inquiries.

For any questions or technical advice, please call Technical Services 24 hours per day, 7 days per week at 800.643.4460 or email INFO@lexproducts.com.

INTRODUCTION

This manual details the installation and use of the Lex Products Outdoor PowerRACK Distribution. This power distribution rack provides a convenient way to adjust the overcurrent protection of the output receptacles. Please review this manual prior to operating the Outdoor PowerRACK. Store this manual in a safe location for future reference.

SHIPMENT: UNPACKING AND INSPECTION

Check the shipment carefully to confirm it arrived complete and undamaged

1. Unpack the shipment and check the contents against the packing list to ensure the order is complete
2. Check the unit for loose or broken components, which might have resulted from shipping
    a. Inspect for signs of damage to wiring devices, device covers or circuit breakers
    b. Open and close the hinged breaker windows to ensure that they open and close properly
    c. If there is any damage to the Outdoor PowerRACK, contact Lex Products Technical Services toll free at 800.643.4460 or email info@lexproducts.com

TRANSPORTATION GUIDELINES

Inspect units before transport to ensure all doors and covers are secured and latched

Remove or stow all cables and accessories prior to transport

Secure the unit to the truck or trailer bed using ratchet straps or load binders. Hole pattern on skids for additional securing methods

Attach straps to frame, handles or fork pockets (not to panel doors, breaker handles, or connectors)

Tighten straps evenly to prevent shifting or twisting during transport

Stacking PowerRACKs forTransport

Do not exceed two units high unless otherwise specified by Lex Products

Ensure rack skids are seated in the skid plates located on the top of the bottom rack

Place the heavier unit on the bottom to maintain stability

Use straps to secure both upper and lower units

Ensure the stack is secured to the transport platform / walls to prevent movement or tipping

Stacking on even surfaces only

Storage and Handling DuringTransit

Maintain upright position at all times; do not lay on back or sides

Unloading Instructions

Unload with a forklift rated for the combined weight of stacked units

Detach upper PowerRACK first when stacked

Move slowly and maintain control — avoid sudden stops or turns

After unloading, visually inspect units for any signs of damage or loose components

Outdoor PowerRACK™ Distribution Components (Typical)

Receptacles
- Wiring device type varies by configuration
- Circuit breakers provide overcurrent protection
- Used to draw power from enclosure

FeedThru (optional)
- Wiring device type matches inlet
- No Overcurrent Protection
- Used to pass thru power to additional distribution units

Power Inlet
- Wiring device type varies by configuration
- Introduces power into the enclosure

Stackable
- In storage, use and track transport
- Do not lift while stacked
- Skid plates on top of rack for proper stacking

Enclosure
- Heavy-duty aluminium panels with integrated side handles designed for hand or strap lift
- Recessed hardware and aluminum frame
- Front and Back panels are recessed for added protection during transport and storage

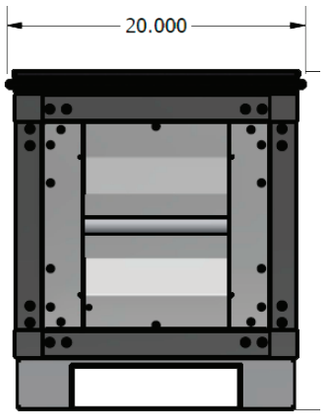
Breakers
- All circuit breakers are located under self-closing hinged windows
- Tighten twist knobs to secure closed

Mains Circuit Breaker (optional)
- Protects the rack from exceeding rated amperage

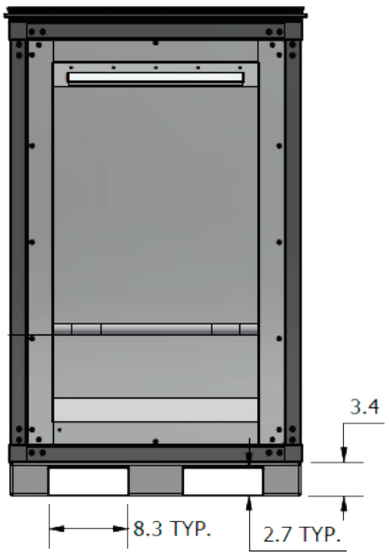
Outdoor Rack Base
- Skid base elevates receptacles above the ground while permitting secure lifting via forklift

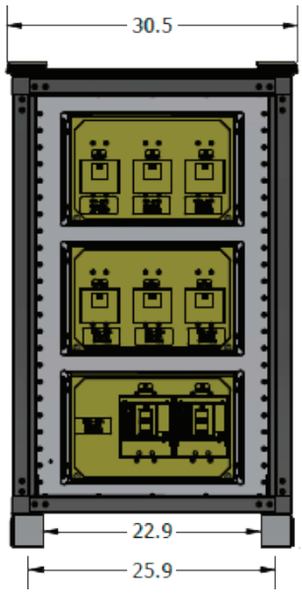
OUTDOOR POWER RACK DIMENSIONS

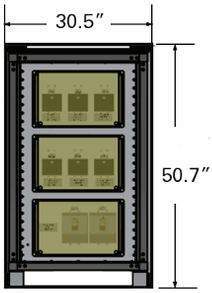
Slim Depth



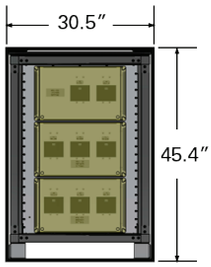
Standard Depth



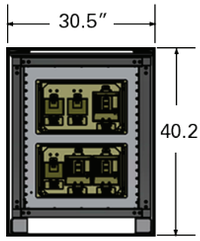




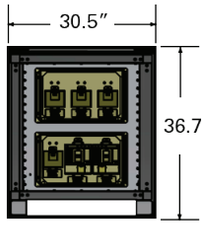
500 Model



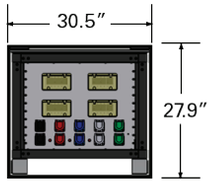
400 Model



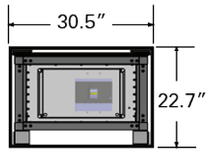
300 Model



200 Model



100 Model



60 Model

Rack Name	Height (in.)	Width (in.)	Depth (in.)	≤ 800A	1200A / 1600A
500	50.7	30.5	31.5	x	x
400	45.4	30.5	31.5	x	x
300	40.2	30.5	31.5	x	x
200	36.7	30.5	31.5	x	x
100	27.9	30.5	31.5	x	
100 Slim	27.9	30.5	20	x	
60 Slim	22.7	30.5	20	x	

SETTING UP THE OUTDOOR POWER DISTRIBUTION UNIT (PDU)

Set up of the Lex Products Outdoor Power Distribution Rack is to be performed by qualified personnel only

Step 1: Placement and Inspection of the Outdoor PowerRACK PDU

1. The Lex Products Outdoor PowerRACK is UL Listed NEMA Type 3R for outdoor use
2. Place the Outdoor PowerRACK on a level location with a dry and firm foundation within proximity of the power source and the location requiring power
3. The base of the unit elevates live electrical components above ground level with skids. Ensure the surface is level and capable of supporting the weight of the PowerRACK
4. The PowerRACK can be stacked one-high in use, storage and vehicle transit
    a. DO NOT LIFT WHILE STACKED
5. The rack can be moved by Forklift, Strap lift, Casters/Cart (specific units), and two-man portable (specific units)
    a. When moving the Outdoor PowerRACK, use the lifting handles on the sides of the rack to lift by hand or with straps
    b. Skids and a fork pocket are located on the bottom of the rack for lifting

Step 2: Prepare For Connection

WARNING: Before making connections to the Outdoor PowerRACK PDU, make sure the power source feeding the box is OFF

WARNING: No connections are to be made while the equipment is energized, including the power source and cables from which it is provided

WARNING: DO NOT exceed the voltage rating of the device as identified on the label attached to the enclosure

WARNING: Both sets of Cam extensions feeding the input must come from the same power source

1. Ensure Main Circuit Breaker for the rack is in the 'O/OFF' position
2. Ensure all Receptacle Circuit Breakers on the rack are in the 'O/OFF' position

NOTE: If using the feed thru feature, connect the feed thru BEFORE the input connection is made

Step 3: Making and Breaking Connections on Outdoor PowerRACK

NOTE: Best practices dictate that load connections, (power output), are completed prior to power inlet connections. This ensures connections are not made while the circuits are energized or 'live', limiting the potential for shock or damage to personnel or loads

Single-pole Cam-Type Connections

When **MAKING** the connection, begin with the GREEN ground connection, then the WHITE neutral connection and finish with the remaining HOT connections

a. Align the screw on the Cam facing up

b. Firmly insert Cam device into panel mounted Cam

c. Rotate clockwise until fully engaged and locked

When **BREAKING** the connection, begin with the HOT connections, then the WHITE neutral connection and finish with the GREEN ground connection.

NEMA Locking Connections

1. Fully insert the male plug into the female receptacle
2. Turn the plug clockwise until it is fully locked, ensuring it is properly seated in its receptacle

NEMA Straight Blade Connections

1. Fully insert the male plug into the female receptacle, ensuring it is properly seated

Pin & Sleeve Connections

1. Align the pins on the male plug to the female receptacle
2. Fully insert the plug into the receptacle
3. Turn the locking ring on the plug clockwise until it is fully locked

Step 4: Powering Up Outdoor PowerRACK

Best practices dictate that loads are applied gradually the first time the system is set up

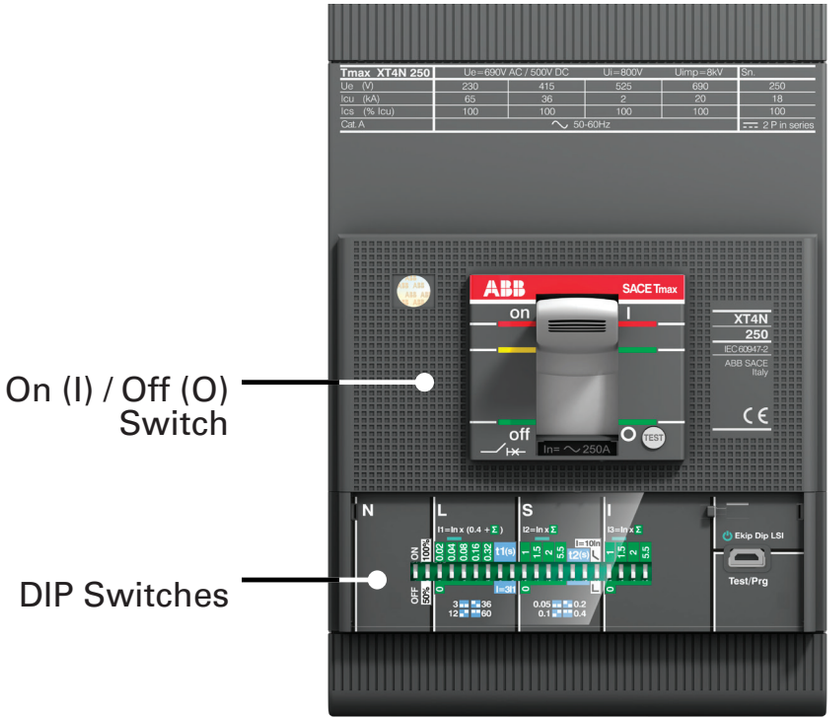
1. Turn on the power source
2. Beginning with the PDU closest to the power source, move the first individual circuit breaker to the 'I/ON' position
3. Ensure the devices fed by that circuit are ON, tracing the electrical path to the final device fed by that circuit
4. Repeat steps 2 and 3 for the remaining circuit breakers

NOTE: If the circuit breaker cannot be energized or trips, check the system for continuity, short circuits and overload. Make the necessary corrections before proceeding

ADJUSTABLE CIRCUIT BREAKERS

All Outdoor PowerRACKs that are in the Load Master® product family, have adjustable breakers for the Cam outputs. The current level of the circuit breakers is adjustable to match the load of the output receptacles. The circuit breakers are adjusted with dip switches located under a clear cover on each circuit breaker.

Figure 3.1: Circuit Breaker (breaker may vary in design)



Function Breakdown of LS/I Breakers

The Ekip Dip LS/I is an electronic trip unit used in ABB's XT series molded case circuit breakers (MCCBs). It provides adjustable protection functions using DIP switches. The LS/I version includes:

L (Long-time protection): Protects against overloads. Providing 16 amerage settings.

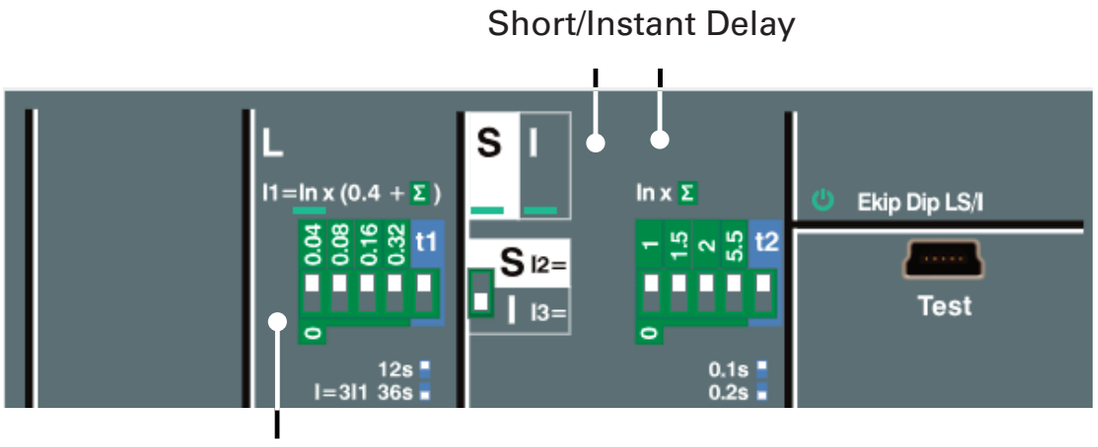
S (Short-time protection): Protects against short-circuits with adjustable delay for selectivity.

I (Instantaneous protection): Trips immediately on very high fault currents.

In Ekip Dip LS/I trip units, the Short-time (S) and Instantaneous (I) protections share a combined control logic, but they are not the same function. The LS/I indicates that the S and I protections are internally coordinated.

Function Breakdown of LS/I Breakers

Figure 3.2: DIP Switches



Long-time Protection (L)
Pickup (Ir): Adjustable from 0.4 × In to 1.0 × In (In = breaker rated current).
Delay (t1): Adjustable delay (in seconds) to prevent nuisance tripping under short overloads.
Purpose: Prevents overheating of cables and conductors due to sustained overload.

Short-time Protection (S)
Pickup (Isd or I2): Adjustable typically 1.5 × Ir to 10 × Ir.
Delay (t2): Adjustable delay (0.1 s to 0.5 s, depending on model).
Purpose: Provides coordination with downstream breakers. Allows a fault closer to the load to be cleared locally before the upstream breaker trips.

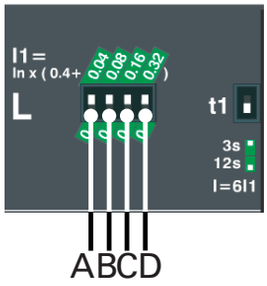
Instantaneous Protection (I)
Pickup (Ii or I3): Adjustable, usually 2 × In up to 15 × In.
Delay: Fixed (no intentional delay).
Purpose: Trips immediately for very high-level short circuits.

DIP Switch Settings
Settings are made with DIP switches on the front of the trip unit. Each function (L, S, I) has its own range of DIP combinations.
L Function: Set Ir (pickup) and t1 (delay)
S Function: Set Isd (pickup) and t2 (delay)
I Function: Set Ii (pickup)

Important: For LS/I breakers, if the fault current is above I2 (the short-time pickup) but below I3, the breaker will trip after the t2 delay (short-time protection). If the fault current is above I3, the breaker will trip instantaneously (I function), regardless of t2. The short-time delay (t2) only applies in the range between I2 and I3.

The trip unit automatically decides based on the current magnitude.

Adjusting the Circuit Breakers



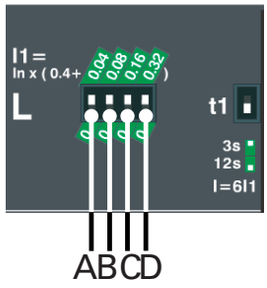
640-1600 Amp Circuit Breaker- DIP Switch Settings

1. Set the DIP switches on the circuit breaker to the closest level indicated in the table below with the set level greater than the actual load
   a. Only adjust the DIP switch labeled "L"
   b. To adjust the circuit breaker, open the clear cover over the DIP switch using a small flathead screw driver
   c. Move each switch (A, B, C, D) into the up or down position based on the table below to achieve the desired output current rating
   d. Close the clear cover over the DIP switch

640-1600 Amp Circuit Breaker Adjustment Settings			
Amps	**Dipswitch Configuration**	**Amps**	**Dipswitch Configuration**
640 Amps	UP / DOWN: A B C D	**1,152 Amps**	UP / DOWN: A B C D
704 Amps	UP / DOWN: A B C D	**1,216 Amps**	UP / DOWN: A B C D
768 Amps	UP / DOWN: B A C D	**1,280 Amps**	UP / DOWN: B A C D
832 Amps	UP / DOWN: A B C D	**1,344 Amps**	UP / DOWN: A B C D
896 Amps	UP / DOWN: C A B D	**1,408 Amps**	UP / DOWN: C A B D
960 Amps	UP / DOWN: A C B D	**1,472 Amps**	UP / DOWN: A C B D
1,024 Amps	UP / DOWN: B C A D	**1,536 Amps**	UP / DOWN: B C A D
1,088 Amps	UP / DOWN: A B C D	**1600 Amps**	UP / DOWN: A B C D

Adjusting the Circuit Breakers (continued)

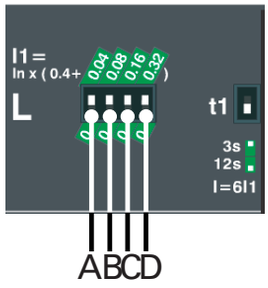
480-1200 Amp Circuit Breaker- DIP Switch Settings



1. Set the DIP switches on the circuit breaker to the closest level indicated in the table below with the set level greater than the actual load
   a. Only adjust the DIP switch labeled "L"
   b. To adjust the circuit breaker, open the clear cover over the DIP switch using a small flathead screw driver
   c. Move each switch (A, B, C, D) into the up or down position based on the table below to achieve the desired output current rating
   d. Close the clear cover over the DIP switch

480-1200 Amp Circuit Breaker Adjustment Settings			
Amps	**Dipswitch Configuration**	**Amps**	**Dipswitch Configuration**
480 Amps	UP / DOWN: A B C D	**864 Amps**	UP / DOWN: A B C D
528 Amps	UP / DOWN: A B C D	**912 Amps**	UP / DOWN: A B C D
576 Amps	UP / DOWN: A B C D	**960 Amps**	UP / DOWN: A B C D
624 Amps	UP / DOWN: A B C D	**1,008 Amps**	UP / DOWN: A B C D
672 Amps	UP / DOWN: A B C D	**1,056 Amps**	UP / DOWN: A B C D
720 Amps	UP / DOWN: A B C D	**1,104 Amps**	UP / DOWN: A B C D
768 Amps	UP / DOWN: A B C D	**1,152 Amps**	UP / DOWN: A B C D
816 Amps	UP / DOWN: A B C D	**1,200 Amps**	UP / DOWN: A B C D

Adjusting the Circuit Breakers (continued)



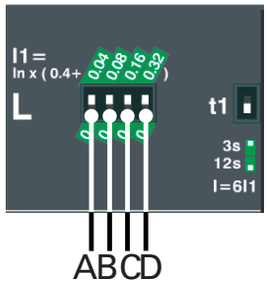
240-600 Amp Circuit Breaker- DIP Switch Settings

1. Set the DIP switches on the circuit breaker to the closest level indicated in the table below with the set level greater than the actual load
   a. Only adjust the DIP switch labeled "L"
   b. To adjust the circuit breaker, open the clear cover over the DIP switch using a small flathead screw driver
   c. Move each switch (A, B, C, D) into the up or down position based on the table below to achieve the desired output current rating
   d. Close the clear cover over the DIP switch

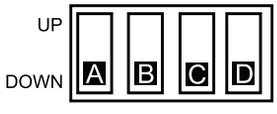
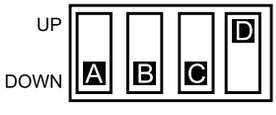
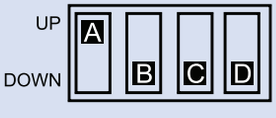
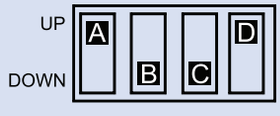
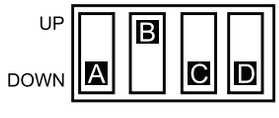
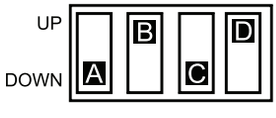
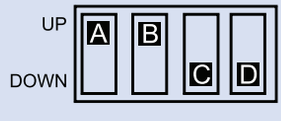
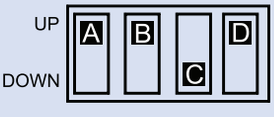
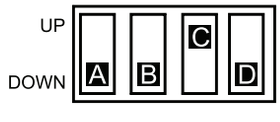
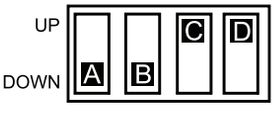
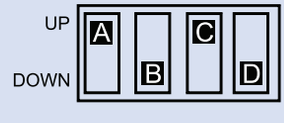
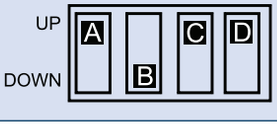
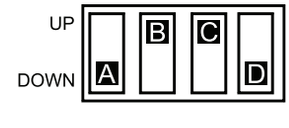
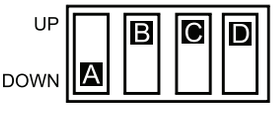
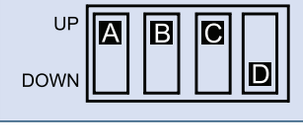
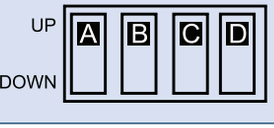
240-600 Amp Circuit Breaker Adjustment Settings			
Amps	**Dipswitch Configuration**	**Amps**	**Dipswitch Configuration**
240 Amps	UP / DOWN: A B C D	**432 Amps**	UP / DOWN: A B C D
264 Amps	UP / DOWN: A B C D	**456 Amps**	UP / DOWN: A B C D
288 Amps	UP / DOWN: A B C D	**480 Amps**	UP / DOWN: A B C D
312 Amps	UP / DOWN: A B C D	**504 Amps**	UP / DOWN: A B C D
336 Amps	UP / DOWN: A B C D	**528 Amps**	UP / DOWN: A B C D
360 Amps	UP / DOWN: A B C D	**552 Amps**	UP / DOWN: A B C D
384 Amps	UP / DOWN: A B C D	**576 Amps**	UP / DOWN: A B C D
408 Amps	UP / DOWN: A B C D	**600 Amps**	UP / DOWN: A B C D

Adjusting the Circuit Breakers (continued)

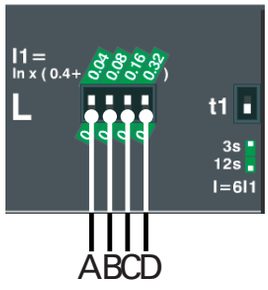
160-400 Amp Circuit Breaker- DIP Switch Settings



1. Set the DIP switches on the circuit breaker to the closest level indicated in the table below with the set level greater than the actual load
   a. Only adjust the DIP switch labeled “L”
   b. To adjust the circuit breaker, open the clear cover over the DIP switch using a small flathead screw driver
   c. Move each switch (A, B, C, D) into the up or down position based on the table below to achieve the desired output current rating
   d. Close the clear cover over the DIP switch

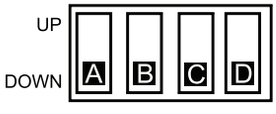
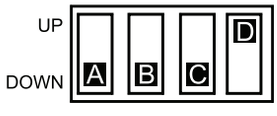
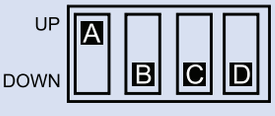
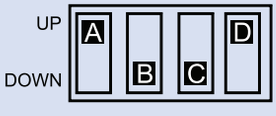
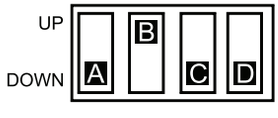
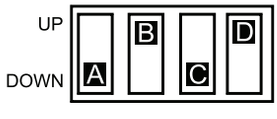
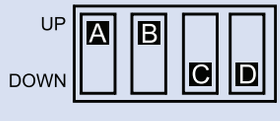
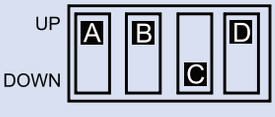
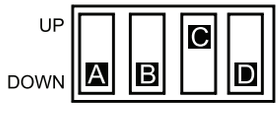
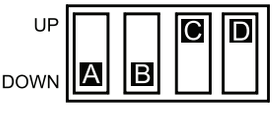
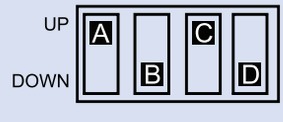
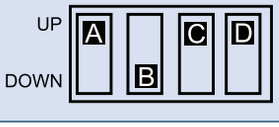
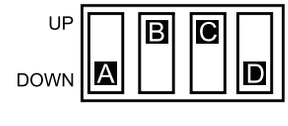
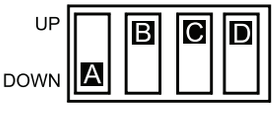
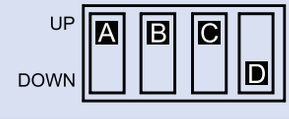
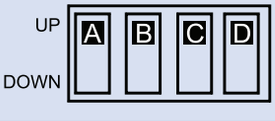
160-400 Amp Circuit Breaker Adjustment Settings			
Amps	**Dipswitch Configuration**	**Amps**	**Dipswitch Configuration**
160 Amps		**288 Amps**	
176 Amps		**304 Amps**	
192 Amps		**320 Amps**	
208 Amps		**336 Amps**	
224 Amps		**352 Amps**	
240 Amps		**368 Amps**	
256 Amps		**384 Amps**	
272 Amps		**400 Amps**	

Adjusting the Circuit Breakers (continued)

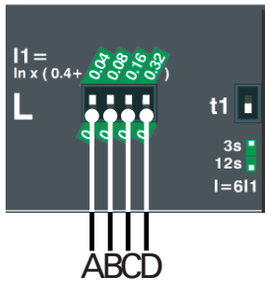


100-250 Amp Circuit Breaker- DIP Switch Settings

1. Set the DIP switches on the circuit breaker to the closest level indicated in the table below with the set level greater than the actual load
   a. Only adjust the DIP switch labeled "L"
   b. To adjust the circuit breaker, open the clear cover over the DIP switch using a small flathead screw driver
   c. Move each switch (A, B, C, D) into the up or down position based on the table below to achieve the desired output current rating
   d. Close the clear cover over the DIP switch

100-250 Amp Circuit Breaker Adjustment Settings			
Amps	**Dipswitch Configuration**	**Amps**	**Dipswitch Configuration**
100 Amps		**180 Amps**	
110 Amps		**190 Amps**	
120 Amps		**200 Amps**	
130 Amps		**210 Amps**	
140 Amps		**220 Amps**	
150 Amps		**230 Amps**	
160 Amps		**240 Amps**	
170 Amps		**250 Amps**	

Adjusting the Circuit Breakers (continued)



60-150 Amp Circuit Breaker- DIP Switch Settings

1. Set the DIP switches on the circuit breaker to the closest level indicated in the table below with the set level greater than the actual load
   a. Only adjust the DIP switch labeled “L”
   b. To adjust the circuit breaker, open the clear cover over the DIP switch using a small flathead screw driver
   c. Move each switch (A, B, C, D) into the up or down position based on the table below to achieve the desired output current rating
   d. Close the clear cover over the DIP switch

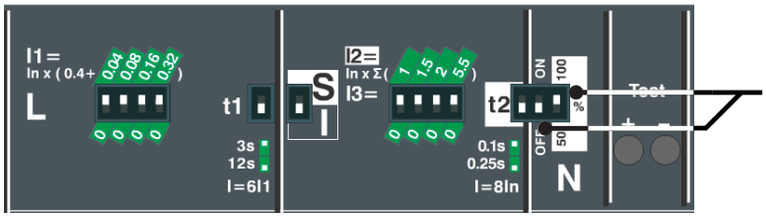
60-150 Amp Circuit Breaker Adjustment Settings			
Amps	**Dipswitch Configuration**	**Amps**	**Dipswitch Configuration**
60 Amps	UP / DOWN: A B C D	**108 Amps**	UP / DOWN: A B C D
66 Amps	UP / DOWN: A B C D	**114 Amps**	UP / DOWN: A B C D
72 Amps	UP / DOWN: A B C D	**120 Amps**	UP / DOWN: A B C D
78 Amps	UP / DOWN: A B C D	**126 Amps**	UP / DOWN: A B C D
84 Amps	UP / DOWN: A B C D	**132 Amps**	UP / DOWN: A B C D
90 Amps	UP / DOWN: A B C D	**138 Amps**	UP / DOWN: A B C D
86 Amps	UP / DOWN: A B C D	**144 Amps**	UP / DOWN: A B C D
102 Amps	UP / DOWN: A B C D	**150 Amps**	UP / DOWN: A B C D

TROUBLESHOOTING GUIDE

To help determine what has caused a circuit breaker to trip, it is important to configure the simplest possible power distribution system set-up under which the problem still occurs. The loads connected to the system might exceed the circuit breaker rating, in which case a larger power distribution unit would be needed. If a larger power distribution unit is needed, contact Lex Products with the load information and requirements of the specific application to determine the appropriate power distribution system.

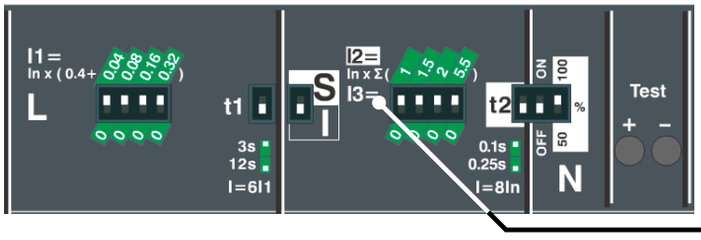
Circuit BreakerTripping During Normal Operation

1. Verify whether circuit breaker long delay settings are set as needed
   a. Ensure the N setting is at 100% and the ON/OFF functionality next to the N is set to OFF
   b. These dip switches are intended for specialized single phase applications and do not apply to the Load Master series under normal operation
2. Retry turning on the circuit after adjustments are made



Set to OFF and 100%

3. If a large inductive load such as an air conditioner was turned on when the circuit breaker tripped, raise inrush settings or increase the trip time delay
   a. The inrush settings can be adjusted by turning on the dip switches for I3.
   b. All dip switches up will result in the maximum inrush tolerance of ten times the circuit breaker rating



I3 dip switches: Move all dip switches UP for maximum inrush tolerance

Circuit BreakerTripping When Powering Up

1. Follow the steps outlined for circuit breakers tripping during normal operation
2. If the issue persists, disconnect the output connections from the circuit breaker that is tripping
3. Turn on all circuit breakers
   a. If the circuit breaker trips, contact Lex Products for technical assistance
   b. If the circuit breaker does not trip proceed to the next step

Circuit Breaker Tripping When Powering Up (continued)

4. Connect the cable to the corresponding circuit breaker outlets and turn off all attached loads
5. Turn on the circuit breaker
   a. If the circuit breaker trips, disconnect cabling used and check for short circuits
   b. Turn off all circuit breakers, check the cabling connected to the Outdoor PowerRACK, and check connected loads for shorts circuits

How to Check an Outdoor Rack for Short Circuits

1. Disconnect incoming power from the Outdoor Rack
2. Turn on circuit breaker(s) for the circuit(s) to be tested
3. Using a continuity meter or a multimeter, set to continuity/resistance mode and connect one probe to the input ground (green) Cam-type connector brass
4. Take the other probe of the meter and check if there is continuity between each Cam-type connector and ground
5. If there is continuity ($R < 1\ k\Omega$, or the meter lights up or beeps), there is short circuit present
   a. Contact Lex Products Technical Services department
6. If there is no continuity, repeat step 3 and 4 checking if there is continuity between the neutral (white) Cam-type connector and the other Cam-type connectors
7. If continuity is detected, there is a short circuit present
   a. Contact Lex Products if a short circuit is detected

No Power at Receptacles

1. Ensure that connections are in place and tight
2. Ensure that power source is live
   a. Activate if not on
3. Ensure that circuit breakers are 'I/ON'
4. If a circuit breaker trips, identify source of short circuit or overload and correct before resetting circuit breaker
   a. Check to see if the circuit is overloaded and reduce loads as needed
   b. Check for short circuits in the cabling or load device and correct as needed
5. For those receptacles that include a GFCIs:
   a. Ensure the GFCIs are set by pressing the 'RESET' button
6. If a GFCI trips, identify source of current leakage and correct before resetting the GFCI
   a. Check to see if the circuit is overloaded and reduce loads as needed
   b. Check for short circuits in the cabling or load device and correct as needed
7. If there is still no power at receptacles:
   a. Remove PDU from use
   b. Contact Lex Products for next course of action

TECHNICAL SUPPORT

Lex Products is available to help answer any installation or operation inquiries. For any questions or technical advice, please call Technical Services 24 hours per day, 7 days per week at 800.643.4460 or email INFO@lexproducts.com.

Notes:

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