



# TOPAZ 12 WALL PACK

INSTALLATION & MAINTENANCE GUIDE  
(Part # LIT-29499-1A)



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Contractor: Please read these instructions before starting installation.  
After installation, please forward this guide to the user for operation and maintenance instruction.

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## TOPAZ 12 WALL PACK INSTALLATION INSTRUCTIONS

The TOPAZ 12 Wall Packs are easy-to-install front-wired electrical distribution panels and are connected similarly to a circuit breaker panel. These instructions will tell you how to mount, wire, assemble, test and maintain TOPAZ 12 Wall Packs. The instructions in this manual are provided in the order of installation.

### Step 1 - Unpack pack(s)

In each pack box you will find one TOPAZ 12 Wall Pack, two keys, and one installation manual (this document). Dimmer and control modules are shipped separate. Leave control module and dimmer modules in their packing and store in clean, dry place until ready to perform Step 10.

After unpacking, please inspect the pack for any possible shipping damage. Document any shipping damage and contact the freight company and Leviton.

### Step 2 - Mount pack(s)

Packs must have 6" (152mm) minimum clearance above fan and 36" (914mm) minimum clearance in front for proper cooling and access. Packs should be located in a clean, dust free environment, within proper operating temperature range. See Specifications - Table IV, pg 10.

#### One pack per location:

*Note:* If you have a multiple pack or semi-recessed installation, skip ahead to the appropriate section for instructions.

- Locate stud or a secure framing member in wall where pack is to be mounted.
- Using the dimensions shown in Figure 1 mark location of one column of 2 mounting holes on wall over stud.
- Fasten pack to wall with appropriate fasteners.

*Note:* Fully-loaded pack weighs 40 pounds (18.2 Kg.), not including wire weight.

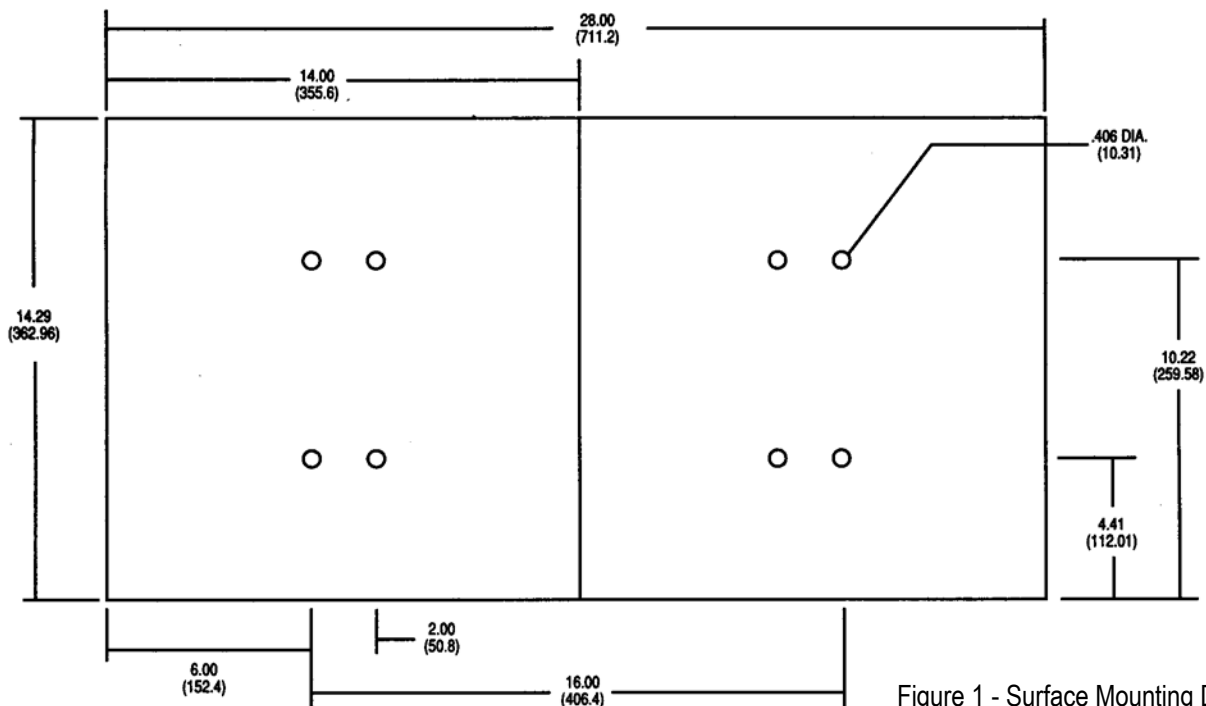


Figure 1 - Surface Mounting Dimensions

#### Two packs mounted together:

- Locate two studs or secure framing members on 16" (406mm) centers in wall where packs are to be mounted.

*Note:* If appropriately spaced studs or framing members cannot be located, packs may have to be mounted on Unistrut or equivalent supporting channels. Skip ahead to the next section for instructions.

Using the dimensions shown in Figure 1 mark location of one column of 2 mounting holes on wall over each stud.

Remove the 3 bolt hole knockouts and the 3/4" T.S. conduit knockout on the mating sides between the two packs. Bolt packs together with 1/4" bolts, internal-tooth lockwashers (one under bolt head and one under nut), and nuts (not supplied). Bush control wire knockout with 3/4" T.S. chase nipple or equivalent (not supplied).

- Fasten packs to wall with appropriate fasteners.

*Note:* Two fully loaded packs weigh 80 pounds (36.2 Kg.), not including wire weight.

**Packs mounted to Unistrut supports:**

*Note:* If more than two packs are mounted together the mounting holes are no longer on 16" centers.

- Using the dimensions shown in Figure 1 mark the wall with the locations of two horizontal mounting channels.
- Fasten two mounting channels, Unistrut P3300T or equivalent (not supplied), to the wall at each vertical stud or framing member.
- Insert Unistrut nuts (not supplied) on 14" (356mm) centers in each channel for each pack section to be mounted.
- Remove the 3 bolt hole knockouts and the 3/4" T.S. conduit knockout on the mating sides between adjacent packs. Bolt packs together with 1/4" bolts, internal-tooth lockwashers (one under bolt head and one under nut), and nuts (not supplied). Bush control wire knockout with 3/4" T.S. chase nipple or equivalent (not supplied).
- Mount the pack assembly to the mounting channels using bolts and lockwashers.

**Semi-Recessed Packs:**

- Locate semi-recessed mounting kit, Model Number 600-906 (shipped separately).
- Mount the two mounting brackets to the sides of the pack with the 10-24 screws and lockwashers supplied. Refer to Figure 2.
- Mount the pack in the wall to two studs or other suitable structure with #12 flat head wood screws (not supplied) or other suitable fastener. Adjust the mounting brackets if necessary to make sure the back of the black extrusion is at least 1/8" (3.175 mm) in front of the finish wall surface.
- Skip to Step 3 for conduit installation instructions and then return to this step.
- Attach the two vertical parts (countersunk holes) of the trim frame to one of the horizontal parts (tapped holes) with 2 black flat-head 6 - 32 screws (supplied).
- Set the other horizontal trim frame part in place on top of the cabinet behind the blower grill.
- Install the pre-assembled trim frame from the bottom of the pack and screw to the top part with the remaining screws. If frame fits loosely, bend the tabs provided in the vertical parts with pliers to press against pack wall.

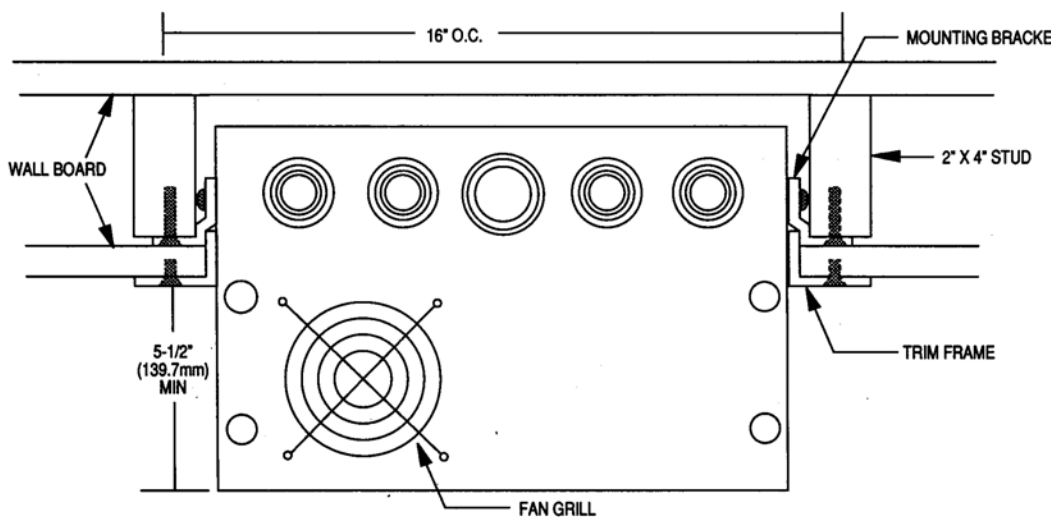


Figure 2 - Semi Recessed Mounting Dimensions

### Step 3 - Terminate conduits

See Figure 3.

- Terminate a feeder conduit at the top or bottom conduit knockouts of each pack. See Table IV, page 10, for knockout size and location.
- Terminate load conduits at top and/or bottom conduit knockouts of the pack which the loads will be connected. In most cases this means the first 12 loads should connect to the first pack, the next 12 loads should connect to the second pack and so on.
- Terminate the control conduits at the top, bottom or side conduit knockouts of the first pack. Bottom or side access is preferable.

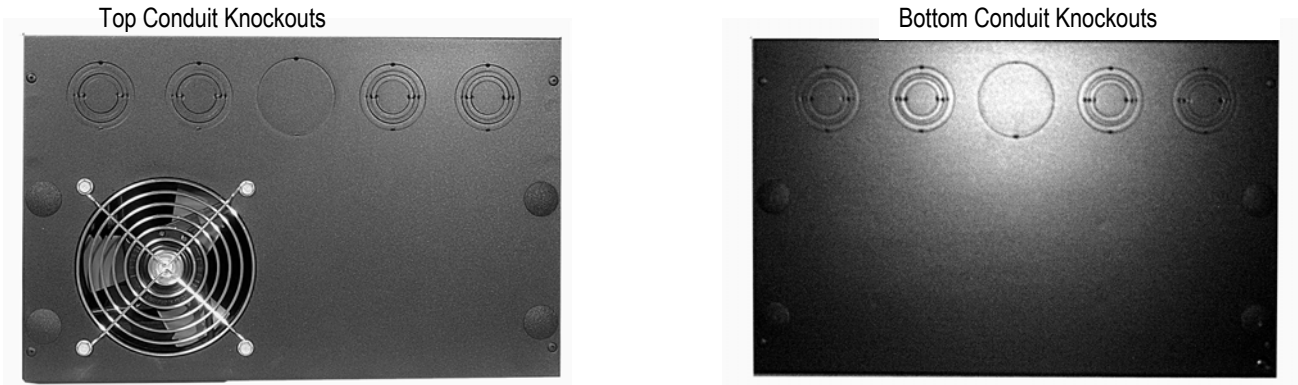


Figure 3 - Conduit Entry Areas

### Step 4 - Convert Bussing To Single-Phase

Packs are shipped ready to accept three-phase, 4 wire feeders. If feeder is single-phase, 3 wire, convert bussing as follows. Otherwise skip to the next Step (5).

- Loosen the four bolts securing the feeder lugs/bussing. See Figure 4.
- Revolve one of the jumpers connecting the two sections of  $\emptyset B$  bussing to the  $\emptyset A$  bus locating it between the  $\emptyset A$  lug and bus.
- Revolve the other jumper to the  $\emptyset C$  bus in the same manner.
- Tighten all four bolts.

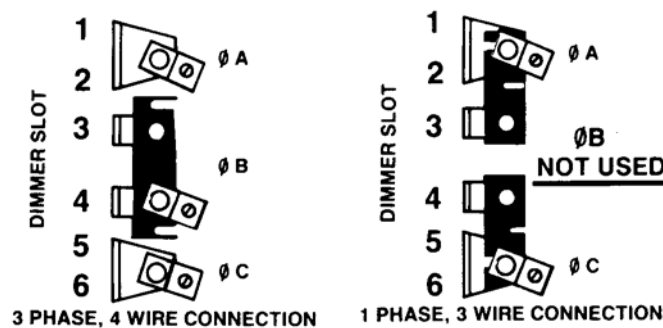


Figure 4 - Bus Conversion

### Step 5 - Pull power, load and control conductors to the pack(s)

- Pull all conductors into the packs. Feeder and load conductors must be rated for 90°C, and be copper. Control conductors must be rated for operation at 85°C and are all Class 2.

### Step 6 - Connect power feeders

- Connect the feeders at the phase, neutral and ground lugs and tighten according to Table I. See Figure 5 for lug locations. (If pack has been converted to single-phase, only lugs A & C will be terminated.)

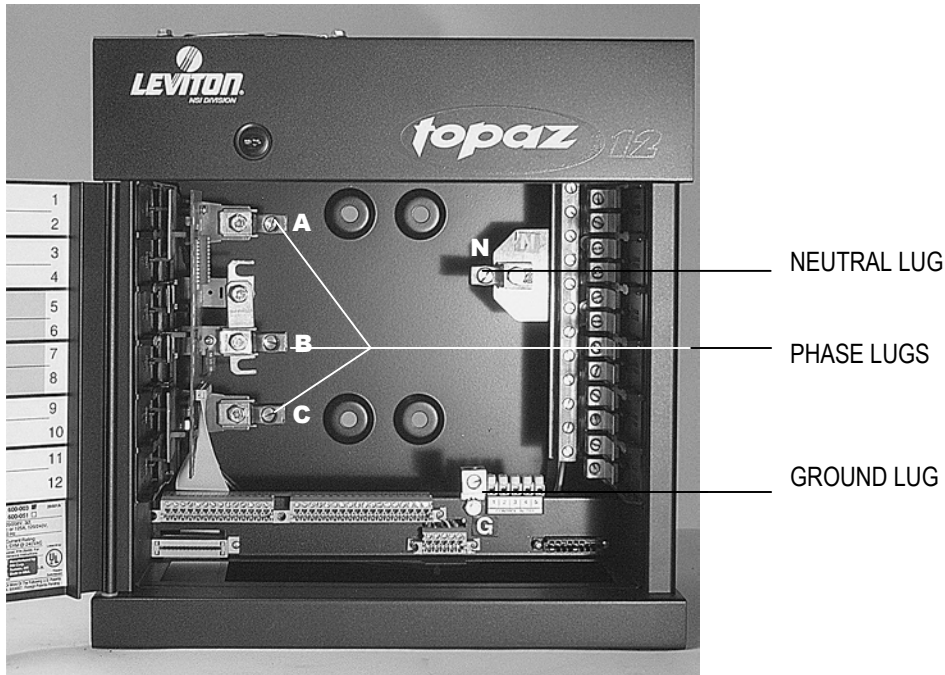


Figure 5 - Power Lug Location

Table I - Line Terminal Torque Ratings

	14 AWG - 10 AWG (2 - 6 mm <sup>2</sup> )	35 in.-lbs.
Line and Neutral Lugs (rated for copper wire only, and for 90°C ampacity wire)	8 AWG (10 mm <sup>2</sup> )	40 in.-lbs.
Ground Lug	6 AWG - 4 AWG (16 - 20 mm <sup>2</sup> )	45 in.-lbs.
	2 AWG - 1/0 AWG (35 - 50 mm <sup>2</sup> )	50 in.-lbs.

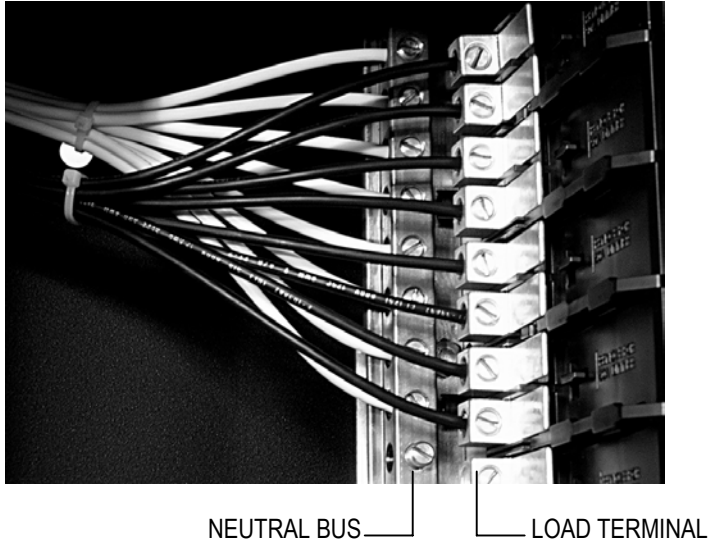
**Step 7 - Connect load conductors**

Follow the instructions here for each dimmer type you are installing.

**15/20 AMP INCANDESCENT & LOW-VOLTAGE LOADS:**

- Referring to Figure 6, connect the load conductor for the first (upper) dimmer to the upper load terminal, and the second load conductor to the lower load terminal. Terminate their respective neutral conductors to the adjacent neutral terminals located directly behind the load lug.

Tighten all lugs according to Table II.



Terminal	15/20A Incandescent, and Low-Voltage Load
1A	1
1B	2
2A	3
↓	↓
4B	8

Figure 6 – Load Terminal Wiring

Table II - Load Terminal Torque Ratings

LOAD TERMINALS (rated for copper wire only, and for 90°C ampacity wire)	
14 AWG - 2 AWG	50 in.-lbs.
(2 - 6 mm <sup>2</sup> )	

**LOW-VOLTAGE APPLICATION NOTES:**

When using TOPAZ 12 dimmer modules with transformer loads, the kW rating becomes the kVA rating. VA ratings are found by multiplying the input voltage (120V) by the current flowing in the transformer primary (120V side) for all transformers connected to the dimmer module. When calculating VA load keep in mind that transformer losses add many VA to the published VA load rating of the transformer. When current cannot be measured, derate the kW rating of the dimmer module by 25% and add up the kW ratings of the lamps involved.

**Caution:**

Operation of a dimmed transformer-loaded circuit with all lamps inoperative or removed may result in current flow or voltage in excess of normal levels. To avoid possible transformer overheating and possible premature transformer failure, Leviton strongly recommends the following:

- a. Do not operate dimmed transformer-loaded circuits without operative lamps in place; and
- b. Replace burned out lamps as quickly as possible; and
- c. Use transformers which incorporate thermal protection or fuse transformer primary windings to prevent transformer failure due to over-current.

For best results transformers employed in transformer-loaded dimmed circuits should be high-quality units well varnished and with an extra margin of magnetic material.

### Step 8 - Connect control conductors

Follow the instructions below for the type of control you are installing.

**Note: All control terminals accept 24-14 AWG. (.02-2 mm<sup>2</sup>) wire and are all Class 2.**

#### DMX512 or CMX:

A "Remote" or "Universal" TOPAZ 12 Control Module is provided for each pack.

- Connect the control wires to the 5-position terminal strip in each pack as shown in Figure 7.  
(For ease of assembly, remove and discard TB2.)

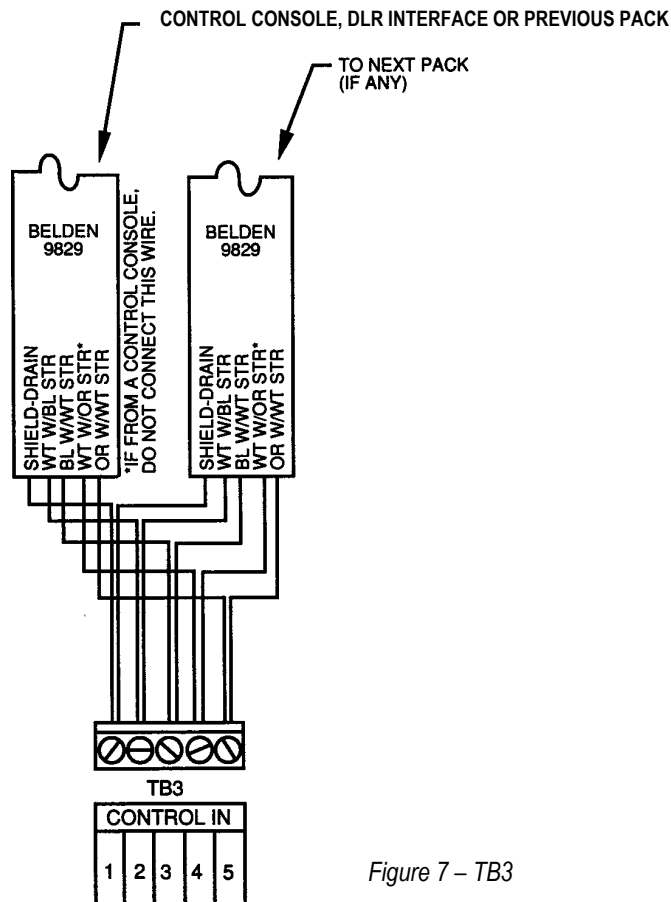


Figure 7 – TB3

#### ANALOG 0-10V:

For analog 0-10V applications, a Universal Control Module must be used.

- Locate the terminal blocks inside the Pack labeled "0 to 10VDC Dimmer Control Inputs." Connect the incoming control wires to terminals 1 – 12. Connect to at least one common terminal per group of 12 inputs.

### Step 9 - Seal unused openings

- Seal any unused mounting and conduit access holes in the pack. This is necessary to maintain proper ventilation while the pack is operating.



**Step 10 - Install control module(s)**

- Unpack the control module(s).
- Set the 3 DIP switches labeled S1 on the printed circuit board (See Figure 8) as follows:  
 SW1 –down  
 SW2 – up  
 SW3 – down
- If the control module is a Remote type, verify that jumper JP5 is in the “REM” position.

Control Module Type	Module No.	
	120V	240V(Foreign Electric Service Only)
TOPAZ 12 Remote	LEC2102	LEC2105
TOPAZ 12 Universal	600-902	600-904

- If the control module is a Universal type, verify that the AMX/DMX switch is in the DMX position and that the Status/Other switch is in DMX position and that the Status/Other switch is in the “Other” position. See Figure 9.
- Install the appropriate control module in the bottom slot of each pack by sliding it in until it is fully seated.

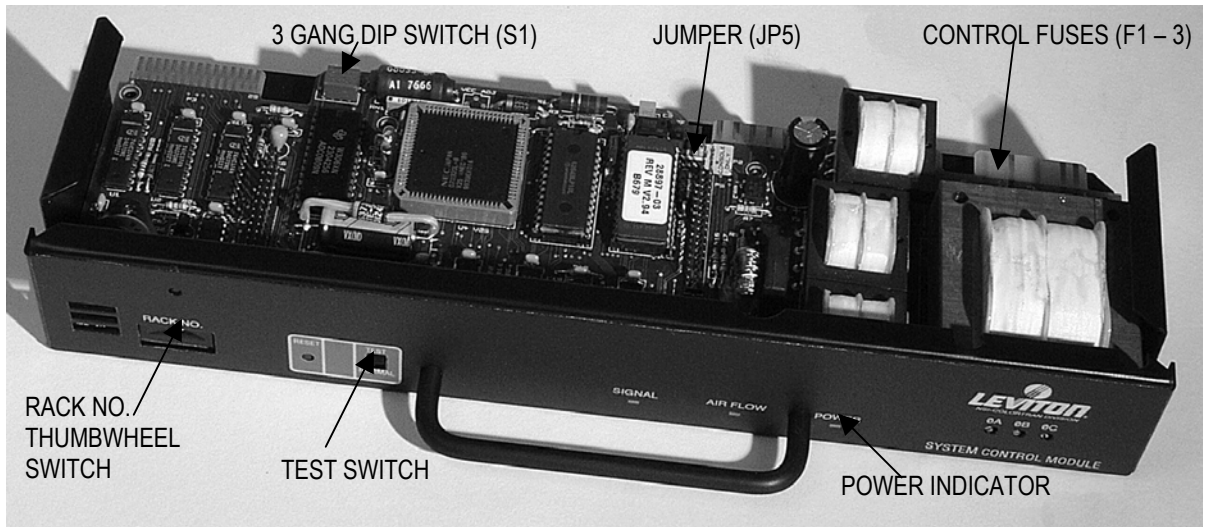


Figure 8 - Remote Control Module

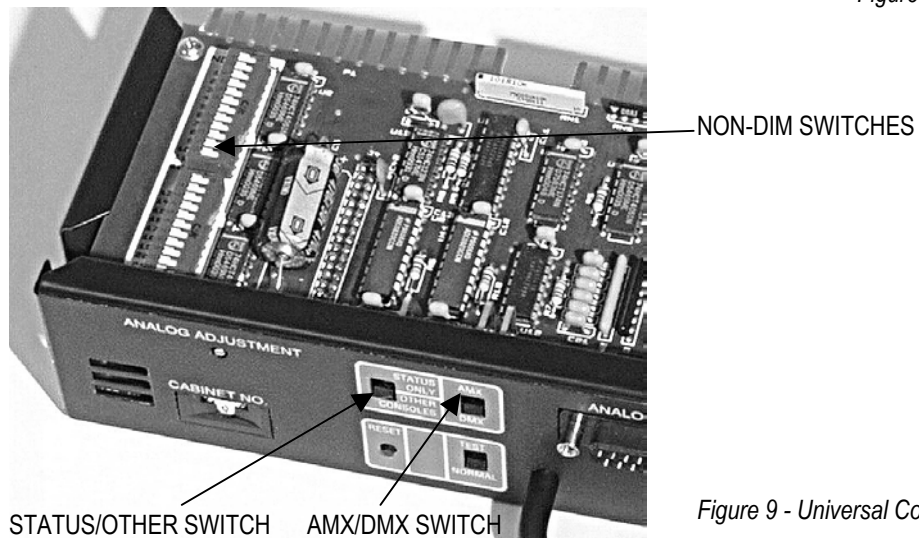


Figure 9 - Universal Control Module

**Step 11 - Set thumbwheel switch(es)**

- Set the thumbwheel switch(es) on all TOPAZ 12 control modules according to Table III on next page. See Figure 8 (Pack 1 is usually the left-most pack).

**Table III - Thumbwheel Switch Settings**

PACK NUMBER	THUMBWHEEL SWITCH NUMBER
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	7
9	8
10	9
11	10
12	11
13	12
14	13
15	14
16	15

**Step 12 - Set Non-Dim switches**

Note: if control module is not a Topaz Universal type, skip to the next step (Step 13).

- Switch Non-Dim switches to select which dimmers are to operate in the Non-Dim mode. The Non-Dim mode switches are located on the left-hand side of the top printed-circuit board on the Universal Control Module. See Figure 9, page 7. In the off (left) position, the channel will function as a dimmer. In the on (right) position, the dimmer will function as a non-dim (fully off or fully on). Only the first twelve switches are used.

**CAUTION: Do not operate these switches while the pack is energized.**

**Step 13 - Apply power and check**

- Apply power to the pack. Power indicator LED should be lit on the control module. If the LED is not lit or is flashing, at least one control fuse is blown or one power leg has no voltage present. Check the control fuses on the rear of the control module. Check the feeder wiring with a meter, correct the problem and restore power to the pack. See Figure 8.

**CAUTION: High Voltage - all measurements with a meter and other operations within the pack must be with the pack de-energized or by a qualified electrical installer exercising extreme care.**

Model No.	Max Load	Voltage	Circuit Breaker
166-361	1.8kW	120	15A
166-362	2.4kW	120	20A
166-364	2.5kW	220/240*	15A

\*(foreign electrical services only)

**Step 14 - Install dimmers**

- Unpack all dimmers.
- Slide a dimmer module into each dimmer slot beginning with the bottom dimmer slots first and building upward. Push the dimmers in until they are seated firmly.

### Step 15 - Install filler modules

- If there are less than 6 dimmer modules for a pack, unpack and install filler modules (Part Number 166-360) in slots where there are no dimmers. This must be done to insure proper cooling while the pack is in operation.

Filler modules look the same as dimmers, but do not have circuit breakers and are installed the same way.

**NOTE:** Pack should not be operated without **all** spaces filled. This insures proper cooling.

### Step 16 - Test loads

- Switch all dimmer circuit breakers OFF first (switched to the right).
- Switch the test switch on the control module to the TEST position. See Figure 8, page 7. This will turn on the fan.
- Switch on the circuit breaker of each dimmer, one at a time, by moving the breaker handle to the left. Verify that the load is on and the dimmer is operating.
- When testing is completed, switch the test switch on each control module to the NORMAL position. This will turn off the fan and all dimmers.
- Verify that all circuit breakers are in the ON position (switched to the left).

### Step 17 - Close door

If desired, label circuits for easy identification later.

Close the front access door. This will aid in proper cooling of the pack and restrict access to the dimmer circuit breakers. See Figure 10.



## MAINTENANCE

Once each year (or more often, if necessary) clean any accumulation of dust from the fan grills, dimmer module air-intake openings and control module front. This may be done with compressed air or a vacuum. Also check all wire terminations for tightness - refer to Tables I and II for torque ratings.

Caution: Do not perform the above maintenance with the rack energized.

<b>Table IV - Specifications (per single pack section)</b>	
Pack Capacity:	12 Circuits, 20 Amp max. per circuit.
Dimensions:	14-1/4" H x 14" W x 9" D (361.95mm H x 356mm W x 229mm D)
Weight:	Empty - 22 lbs. (10 Kg.) Full - 40 lbs. (18.1 8 Kg.)
Conduit Knockouts Top and Bottom Load/Line:	4 concentric 1/2", 3/4", 1", 1 -1 /4" T.S. 1 concentric 1", 1-1/4", 1-1/2" T.S.
Sides,Control Signal:	1 concentric 1/2", 3/4"
Maximum Fan Noise Rating:	NC33
Maximum Ambient Operating Temperature:	40°C (104°F)
Maximum Operating Humidity:	90% without condensation.
Maximum Feeder Size:	125 Amp.
Nominal Input: 120 V Circuits:	120/208V, 3Ø, 4W, 50/60 Hz, or 120/240V, 1Ø, 3W, 50/60 Hz.
240V Circuits: (FOREIGN ELECTRICAL SERVICE ONLY)	240/415V, 3Ø, 4W, 50/60Hz, or 240/480V, 1Ø, 3W, 50/60Hz
Pack Enclosure:	NEMA Type 1 for indoor use only (utiliser dans un endroit a l'abri)
Phase-to-Neutral Operating Voltage:	120V $\pm$ 10% or 220/240V $\pm$ 10%
Operating Frequency:	50 $\pm$ .5Hz or 60 $\pm$ .5Hz

For further information on the operation of the TOPAZ 12 Wall Pack refer to the user guides and operations manuals of the control console or architectural control stations that will be used in conjunction with this product. For additional assistance, please contact the NSI Technical Support Line, Monday through Friday, 8:00 am to 5:00 pm PST.  
1-800-864-2502

## LEVITON-NSI DIVISION TWO-YEAR LIMITED WARRANTY

Leviton-NSI warrants new Leviton-NSI electronic control and dimmer products to be free from defective materials and workmanship for a period of two years from the date of purchase to the original owner when purchased from an authorized Leviton-NSI dealer.

Fixtures, lamps and gel material are not covered under this warranty.

The purchaser is encouraged to complete and mail to Leviton-NSI the product registration card enclosed with each product. Leviton-NSI products that have been subjected to accident, alteration, abuse or defacing of the serial number are not covered by this warranty. The normal wear and tear of items such as knobs, jacks and switches are not covered under this warranty.

If your Leviton-NSI product requires service during the warranty period, Leviton-NSI will repair, at its option, defective materials provided you have identified yourself as the original owner of the product to Leviton-NSI or any authorized Leviton-NSI dealer. Transportation charges to and from an authorized dealer or the Leviton-NSI factory for repair shall be the responsibility of the owner. All products returned to Leviton-NSI must have a factory return authorization number issued prior to shipping.

Leviton-NSI is not liable for any incidental or consequential damages resulting from defect or failure other than repairs of the Leviton-NSI product subject to the terms of this warranty. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty is expressly in lieu of all other agreements and warranties expressed or implied except as may be otherwise required by law.



20497 SW Teton Avenue  
Tualatin, OR 97062  
503-404-5500  
fax: 503-404-5600