# Switching Panels

Installation Guide Softswitch128™ (XPS) and GRAFIK Systems™ (XP)

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XPS48-1204ML-20 shown

# Overview

Use this guide to successfully install a switching panel. This guide describes panel installation, wiring, and load activation. For systems using rough-in panels, special instructions are included for keepout areas, panel mounting, and installing the panel interior.

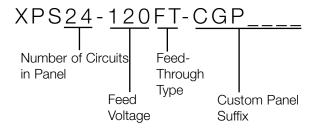


## Panel Model Number Guide

## Softswitch128™ (XPS)

#### **Feed-Through Model Numbers**

Example



#### **Number of Circuits in Panel**

Indicates number of switching circuits in the panel: 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, or 48

#### Feed Voltage<sup>1, 2</sup>

#### Omit for dual voltage

**120** for 120 V $\sim$ 

**230** for 230  $V \sim (CE)$ 

**240** for 220-240 V~ (non-CE)

**277** for 277 V $\sim$ 

#### **Load Circuit Rating**

16 A per circuit

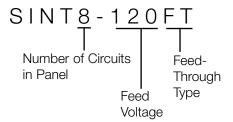
#### **Custom Panel Suffix**

Contact Lutron for options

#### Rough-In Model Numbers

120/277 V $\sim$  only

Example



#### **Number of Circuits in Panel**

Indicates number of switching circuits in the

8, 12, 16, 20, 24, 28, 32, 36, 40, 44, or 48

#### Feed Voltage1, 2

Omit for dual voltage

**120** for 120 V $\sim$ 

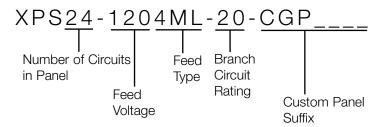
**277** for 277 V $\sim$ 

#### **Load Circuit Rating**

16 A per circuit

#### **Branch Circuit Breaker Model Numbers**

Example



#### Number of Circuits in Panel

Indicates number of switching circuits in the panel: 8, 12, 16, 20, 24 (all voltages) 28, 32, 36, 40, or 42 (120/277/347 V~ only)

#### Feed Voltage

**120** for 120 V $\sim$ 

**230** for 230 V $\sim$  (CE)

**240** for 220-240 V ~ (non-CE)

**277** for 277 V∼ **347** for 347 V $\sim$ 

Feed Type

#### **Input Ratings**

**4ML** for 3 phase 4 wire main lugs 120/208 V~

or 277/480 V $\sim$ 

or 230/400 V~

or 220/380-240/415 V~

**3ML** for 1 phase 3 wire main lugs 120/240 V~

**4IS** for 3 phase 4 wire isolation switch

#### **Branch Circuit Rating**

20 for 20 A branch circuit breakers (120/277/347 V~; 16 A continuous load rating)

**16** for 16 A branch circuit breakers (230/220-240  $V\sim$ )

#### **Custom Panel Suffix**

Contact Lutron for options

#### Frequency - All Model Numbers and Voltages

50/60 Hz

#### **Output Voltages**

120 V $\sim$ , 230 V $\sim$ , 240 V $\sim$ , 277 V $\sim$ , or 347 V $\sim$ 

 $^{1}$ Multiple voltages (120 V $\sim$  and 277 V $\sim$ ) may be switched in the same panel. At least one feed of the specified voltage is required for the low voltage control transformer in the panel.

<sup>2</sup>If voltage is not specified in the model number (e.g., XPS24-FT) product is rated 120  $V\sim$  or 277 V ~. Refer to Wiring section.

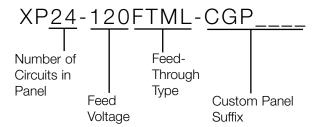


# Panel Model Number Guide (continued)

# GRAFIK Systems™ (XP)

#### Feed-Through Model Numbers

Example



#### **Number of Circuits in Panel**

Indicates number of switching circuits in the panel: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, or 48

#### Feed Voltage1, 2

#### Omit for dual voltage

**120** for 120 V $\sim$ 

**230** for 230 V $\sim$  (CE)

**240** for 220-240 V ~ (non-CE)

**277** for 277 V∼

**347** for 347 V $\sim$ 

#### **Load Circuit Rating**

16 A per circuit

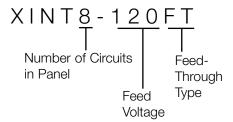
#### **Custom Panel Suffix**

Contact Lutron for options

#### **Rough-In Model Numbers**

120/277 V $\sim$  only

Example



#### **Number of Circuits in Panel**

Indicates number of switching circuits in the panel:

4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, or 48

#### Feed Voltage1, 2

Omit for dual voltage

**120** for 120 V $\sim$ 

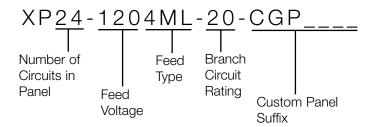
**277** for 277 V $\sim$ 

#### **Load Circuit Rating**

16 A per circuit

#### **Branch Circuit Breaker Model Numbers**

Example



#### **Number of Circuits in Panel**

Indicates number of switching circuits in the panel: 4, 8, 12, 16, 20, 24 (all voltages) 28, 32, 36, 40, or 42  $(120/277/347 \text{ V} \sim \text{only})$ 

#### Feed Voltage

**120** for 120 V $\sim$ 

**230** for 230 V $\sim$  (CE)

**240** for 220-240 V ~ (non-CE)

**277** for 277 V $\sim$ 

**347** for 347 V∼

#### Feed Type Input Ratings

**4ML** for 3 phase 4 wire main lugs 120/208 V

or 277/480 V~

or 230/400 V~

or 220/380-240/415 V~

**3ML** for 1 phase 3 wire main lugs 120/240 V~

IS for 3 phase 4 wire isolation switch

#### **Branch Circuit Rating**

20 for 20 A branch circuit breakers (120/277/347 V ∼; 16 A continuous load rating)

**16** for 16 A branch circuit breakers (230/220-240 V $\sim$ )

#### **Custom Panel Suffix**

Contact Lutron for options

#### Frequency - All Model Numbers and Voltages

50/60 Hz

#### **Output Voltages**

120 V $\sim$ , 230 V $\sim$ , 240 V $\sim$ , 277 V $\sim$ , or 347 V $\sim$ 

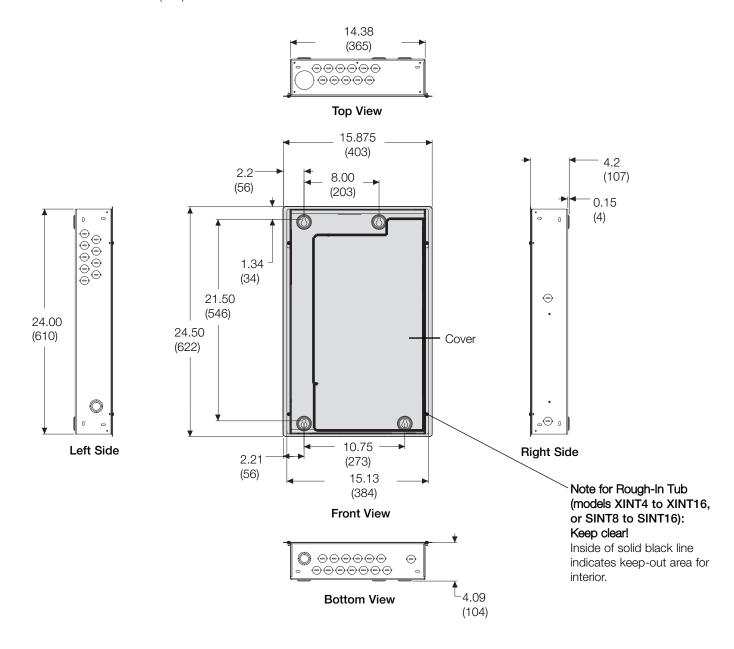
Multiple voltages (120  $V\sim$  and 277  $V\sim$ ) may be switched in the same panel. At least one feed of the specified voltage is required for the low voltage control transformer in the panel.

 $^{2}$ lf voltage is not specified in the model number (e.g., XPS24-FT) product is rated 120 V  $\sim$  or 277 V  $\sim$  . Refer to Wiring section.



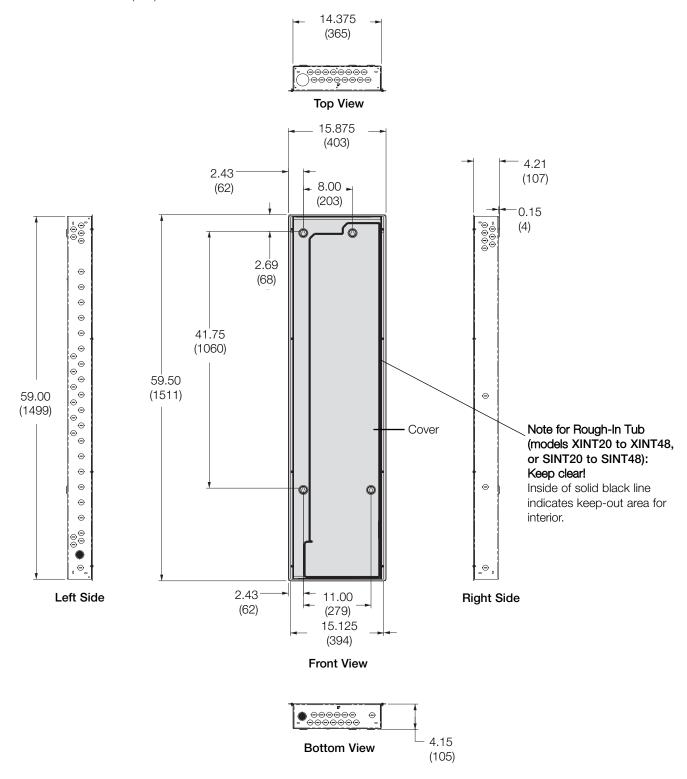
# **Panel Dimensions**

# Mini Panel



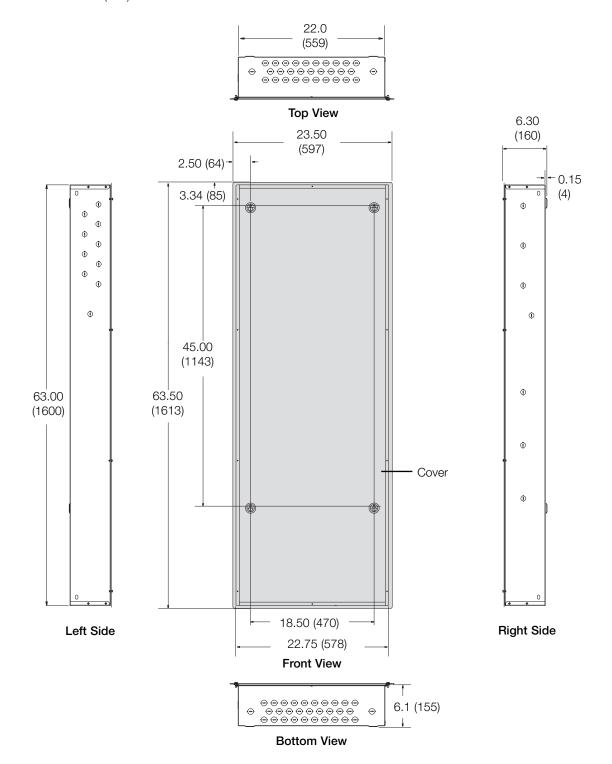
# Panel Dimensions (continued)

## Standard Panel



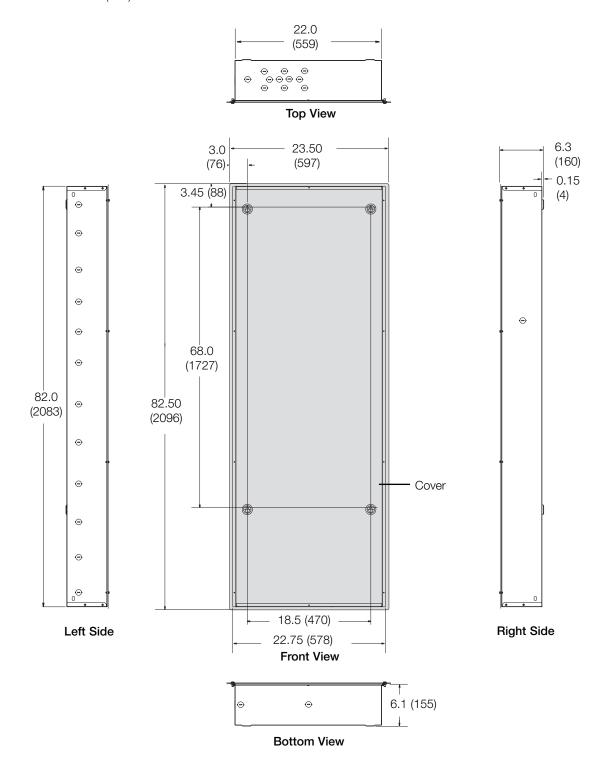
# Panel Dimensions (continued)

# Large Panel (120/277/347 V $\sim$ only)



# Panel Dimensions (continued)

# Extra-Large Panel (277/347 V~ only)



# **Panel Mounting**

# Panel and TUB Mounting

#### **Mounting Guidelines**

- For Indoor Use Only! NEMA, Type 1 enclosure, IP20.
- Large and extra-large panels for surface mount only.
- Panel generates heat. Mount where ambient temperature is 32-104 °F (0-40 °C).
- Relative humidity must be <90% non-condensing.
- Reinforce wall structure for panel weight and local codes: see table.
- Mount panel where audible noise is acceptable. (Internal relays click.)
- Mount panel so line (mains) voltage wiring is at least 6 feet (1.8 m) from audio or electronic equipment and associated wiring.
- Mount within 7° of true vertical.
- Consult Dimensions page for dimensions, conduit knockouts, and mounting holes and hardware.
- Install in accordance with all national and local electrical codes.

#### Maximum Panel Weights

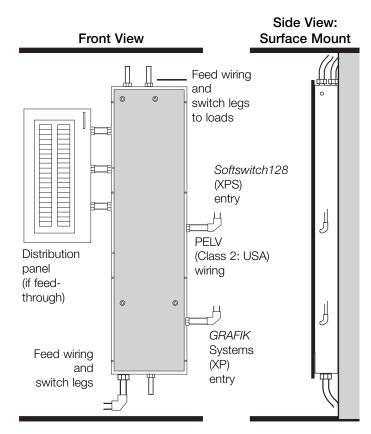
30 pounds (13.9 kg) Mini Standard 80 pounds (37 kg) 135 pounds (61.3 kg) Large Extra-Large 200 pounds (90.7 kg)

# Recommended Mounting Heights\*

(120/277/347 V~ Softswitch128 systems)

45 in. (1143 mm) Mini 25 in. (635 mm) Standard Large 10 in. (254 mm) 7 in. (178 mm) Extra-Large

\*Measure from floor to bottom of panel. Provides optimal viewing height for controller.



# **Recess Mount**

Side View:

#### **Surface Mounting**

- Lutron recommends using 1/4 in. (6 mm) mounting bolts (maximum size accepted by keyholes).
- Allow room for cover. Leave 1 1/2 in. (38 mm) clearance to each side of panel.

#### **Recess Mounting**

- Mount panel between flush and 1/8 in. (3 mm) below finished wall surface.
- Allow room for cover. Leave 1 1/2 in. (38 mm) clearance to each side of panel.

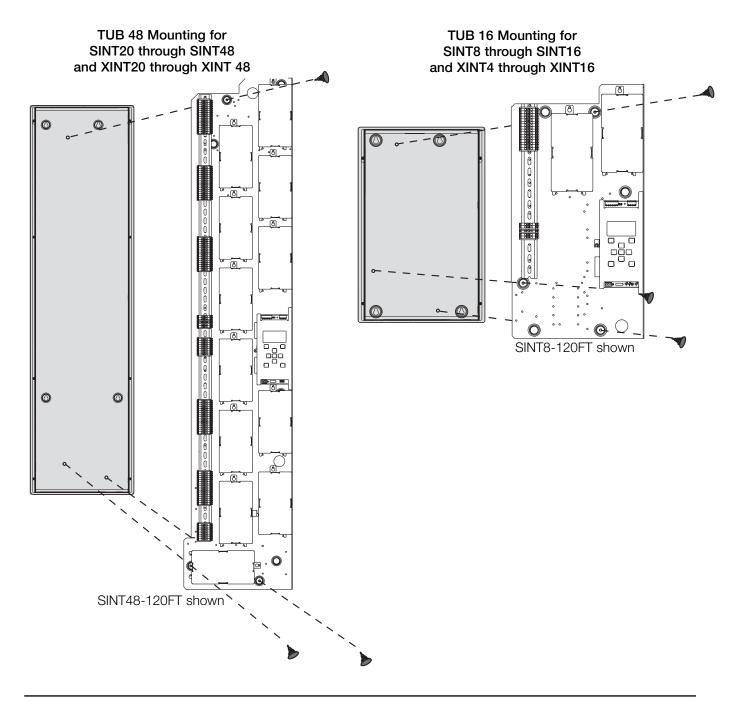


# Panel Mounting (continued)

# Rough-In Panel Interior Mounting (Rough-in Panels ONLY) (120/277/347 V $\sim$ only)

#### Mounting for SINT or XINT Plate:

- Insert interior into TUB.
- Rest interior on bottom of TUB.
- · Press interior flat into back of TUB.
- Insert 3 screws (provided) as shown into interior to secure to TUB.
- All mounting guidelines apply (see previous page).





# Feed-Through Panel: Feed and Load Wiring

- Use a trough when the switching panel is far away from the distribution panel. Splice neutrals in trough.
- Wire the switching panel similar to a lighting distribution panel. Run feed and load wiring.
- Use the switching panel to provide temporary lighting by leaving the bypass jumpers in place. (See page 16 for more details.)

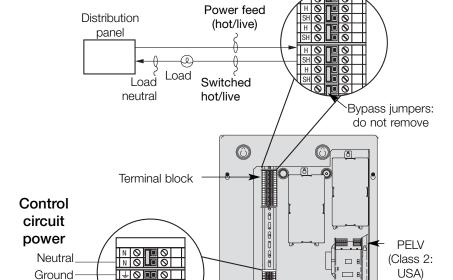
Typical load circuit

#### Wire Sizes

- Power Feed (Hot/Live): #14-#10 AWG (2.5-4.0 mm<sup>2</sup>)
- Switched Hot/Live: #14-#10 AWG (2.5-4.0 mm<sup>2</sup>)

#### **Control Circuit Power:**

- Supplies power for internal operation.
- Requires dedicated feed with same voltage and phase as panel.
- Must be 1/4" (6 mm) away from PELV (Class 2: USA) control wiring harness.
- Panel voltage (see pages 2-3) indicates feed voltage.
- For 230 V $\sim$  and 240 V $\sim$  panels, "Hot" is referred to as "Live". Therefore, terminals will be labeled L and SL.



XINT8-120FT shown

# Dual-Voltage Panel: Feed and Load Wiring (120/277 V ∼ only)

Dedicated

hot/live

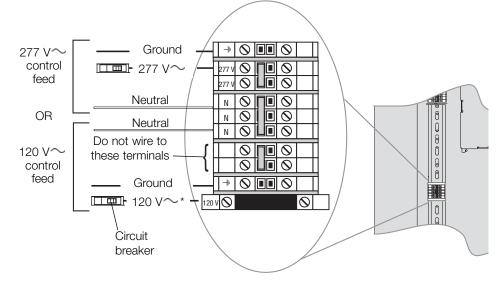
H O 10 O



Wire to either the 120 V $\sim$  or the 277 V∼ control feed terminals, not both. The terminals for the unused voltage will remain empty.

#### \*Note:

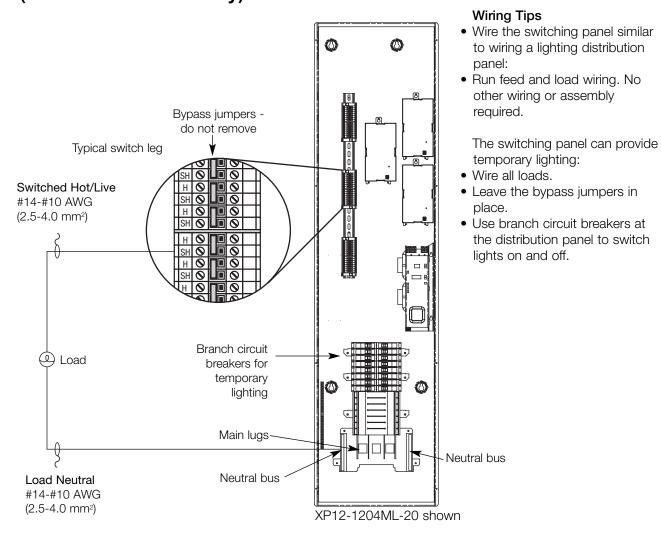
120 V ∼ Hot/Live terminal is protected by an internal fuse in case 277 V ∼ is mistakenly applied. A spare fuse is also supplied in the panel terminal block.



wiring

entrance

# Panel with Branch Circuit Breakers: Feed and Load Wiring (120/277/347 $V\sim\,$ only)



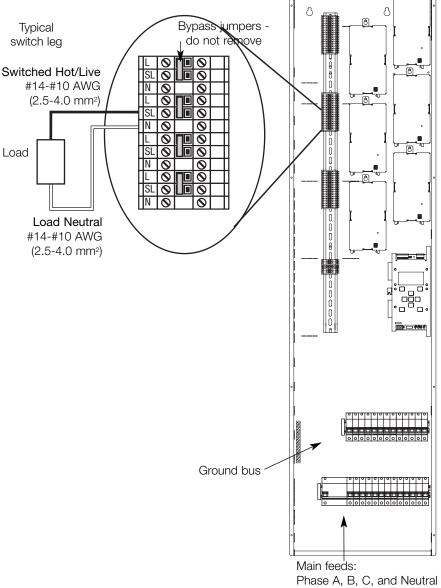
#### Feed Wiring

#### Wire Sizes

120 V $\sim$  #4 AWG to 250 KCMIL (MCM) (25-185 mm<sup>2</sup>)



# Panel with Isolation Switch: Feed and Load Wiring (230/220-240 V $\sim$ only)



#### Wiring Tips

- Wire the switching panel similar to wiring a lighting distribution
- Run feed and load wiring. No other wiring or assembly required.

The switching panel can provide temporary lighting:

- Wire all loads.
- Leave the bypass jumpers in
- Use branch circuit breakers at the distribution panel to switch lights on and off.

#### Wire Sizes

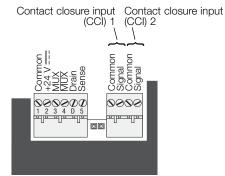
230 V~ #14-#2 AWG (2.0-35 mm<sup>2</sup>) 220-240 V~ #14-#10 AWG (2.0-4.0 mm<sup>2</sup>)



# **System Wiring Overview**

Review the options below for information on wiring your panel correctly into your specific system.

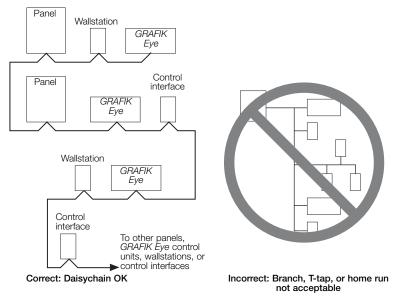
# **A.** Softswitch128™ (XPS) panel: Refer to the Softswitch128 Setup and Operation Manual for detailed wiring information.



**Controller Terminals** 

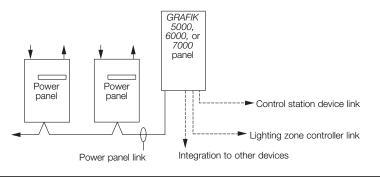
# B. GRAFIK Systems™ (XP) panel as a part of a GRAFIK Eye 4000 lighting system: Refer to the

GRAFIK Eye 4000 Installation, Setup, and Operation Manual and the system overview pictured here for detailed wiring information.

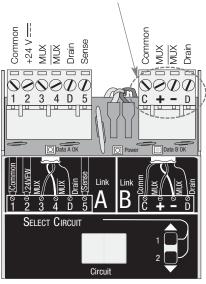


# C. GRAFIK Systems™ (XP) panel as a part of a GRAFIK 7000 lighting system: Refer to the

GRAFIK7000 Installation, and Maintenance Guide and the system overview pictured here for detailed wiring information.



Note: Single-link circuit selectors will not have Link B connector.



**Circuit Selector Terminals** 

# **Ratings**

# Softswitch128™ (XPS)

Use the charts below to determine feed and load wiring sizes for Softswitch128 panels. Note that load circuit wiring sizes are shown bottom right.

#### 120 V $\sim$ Panels with Branch Circuit Breakers

XPS	3	Switch	Feed	Max
Mo	del	Legs	Type	Feed
XPS	88	8		
XPS	312	12	3Ø 4W or	
XPS	316	16	1Ø 3W	200 A
XPS	S20	20		
XPS	S24	24	Main Lug Accepts:	
XPS	S28	28	_ #4 AWG to 250 _	
XPS	332	32	KCMIL (MCM)	
XPS	336	36	(25-120 mm <sup>2</sup> )	225 A
XPS	340	40		
XPS	342	42		

#### 277 V∼ Panels with Branch Circuit Breakers

XPS	Switch	Feed	Max
Model	Legs	Type	Feed
XPS8	8	3Ø 4W or 1Ø 3W	
XPS12	12	Main Lug Accepts:	
XPS16	16	#4 AWG to 250	250 A
XPS20	20	KCMIL (MCM)	
XPS24	24	(25-120 mm²)	
XPS28	28		
XPS32	32	Main Lug Accepts:	
XPS36	36	#4 AWG to 350	300 A
XPS40	40	KCMIL (MCM)	
XPS42	42	(25-185 mm <sup>2</sup> )	

#### 220-240 V $\sim$ and 230 V $\sim$ Panels with Branch Circuit Breakers

XPS	Switch	Feed	Max
Model	Legs	Type	Feed
XPS8	8	3Ø 4W	125 A
XPS12	12	Isolation Switch	
XPS16	16	Accepts:	
XPS20	20	#14-#2 AWG	
XPS24	24	(2.0-35 mm²)	

#### Feed-Through (FT) and Rough-In (RI) Panels (120 V $\sim$ , 277 V $\sim$ , 120/277 V $\sim$ )

	(0 .	,	, . = 0, =	,
FT	RI	Switch	Feed	Max
 Model	Model	Legs	Type	Feed
XPS8	SINT8	8		
XPS12	SINT12	12	1Ø 2W	
XPS16	SINT16	16		
XPS20	SINT20	20	#14-#10 AWG	
XPS24	SINT24	24	(2.5 -4.0	20 A
XPS28	SINT28	28	mm²)	
XPS32	SINT32	32		
XPS36	SINT36	36		
XPS40	SINT40	40		
XPS44	SINT44	44		
 XPS48	SINT48	48		

#### **Load Circuit Wiring**

Terminal blocks accept one #14-#10 AWG (2.5-4.0 mm²) wire. Preferred entry is from the top of the panel.

# Ratings (continued)

# GRAFIK Systems™ (XP)

Use the charts below to determine feed and load wiring sizes for *GRAFIK* Systems panels. Note that load circuit wiring sizes are shown bottom right.

# 120 V ∼ Panels with Branch Circuit Breakers

	XP	Switch	Feed	Max
	Model	Legs	Type	Feed
	XP4	4		
	XP8	8		
	XP12	12	3Ø 4W or	
	XP16	16	1Ø 3W	200 A
	XP20	20		
	XP24	24	Main Lug Accepts:	
_	XP28	28	#4 AWG to 250	
	XP32	32	KCMIL (MCM)	
	XP36	36	(25-120 mm <sup>2</sup> )	225 A
	XP40	40		
	XP42	42		

# 277 V $\sim$ Panels with Branch Circuit Breakers

XP	Switch	Feed	Max
Model	Legs	Type	Feed
XP4	4		
XP8	8	3Ø 4W or 1Ø 3W	
XP12	12	Main Lug Accepts:	
XP16	16	#4 AWG to 250	250 A
XP20	20	KCMIL (MCM)	
XP24	24	(25-120 mm <sup>2</sup> )	
XP28	28		
XP32	32	Main Lug Accepts:	
XP36	36	#4 AWG to 350	300 A
XP40	40	KCMIL (MCM)	
XP42	42	(25-185 mm²)	

# 220-240 V $\sim$ and 230 V $\sim$ Panels with Branch Circuit Breakers

XPS	Switch	Feed	Max
Model	Legs	Type	Feed
XPS8	8	3Ø 4W	
XPS12	12	Isolation Switch	
XPS16	16	Accepts:	125 A
XPS20	20	#14-#2 AWG	
XPS24	24	(2.0-35 mm <sup>2</sup> )	

# Feed-Through (FT) and Rough-In (RI) Panels (120 $V\sim$ , 277 $V\sim$ , 120/277 $V\sim$ )

	(	,	,	,
FT	RI	Switch	Feed	Max
Model	Model	Legs	Type	Feed
XP4	XINT4	4		
XP8	XINT8	8	1Ø 2W	
XP12	XINT12	12		
XP16	XINT16	16	#14-#10 AWG	i
XP20	XINT20	20	(2.5-4.0	20 A
XP24	XINT24	24	mm²)	
XP28	XINT28	28		
XP32	XINT32	32		
XP36	XINT36	36		
XP40	XINT40	40		
XP44	XINT44	44		
XP48	XINT48	48		

#### **Load Circuit Wiring**

Terminal blocks accept one #14-#10 AWG (2.5-4.0 mm²) wire. Preferred entry is from the top of the panel.

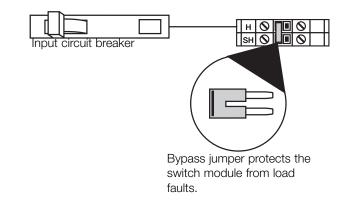


# **Temporary Lighting**

You do not need to install a temporary distribution panel. Connect load wires into the appropriate terminal blocks. Each input breaker can supply power to a load while the bypass jumper protects the module from load faults.



**Warning!** Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause over-voltage damage to the equipment. Do NOT remove bypass jumpers at this point--they protect the modules from load faults.



# **Activate Loads in Bypass**

- A. Complete load wiring.
- B. Check that the bypass jumpers are in place.

  These jumpers protect from load faults and must be used to check load wiring when it is installed or modified.

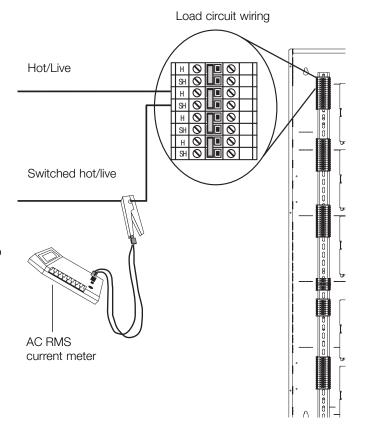


**Warning!** Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause damage to the equipment.

C. Turn a load's input circuit breaker ON.

The load should energize, the breaker should not trip, and total load current must be within the circuit breaker's limit and less than or equivalent to 16 A

D. Repeat step C for each circuit with completed load wiring.



# **Complete Installation**

You have completed your panel installation.

For Onsite Factory Commissioning, call Lutron Technical Support and select Startup to schedule a field service visit. Allow for 10 working days between day of call and scheduled visit.

If you purchased Telephone Startup (Softswitch128/XPS only), stop here and complete the Control Location, Panel, and Control Station Tables that are located in the back of the Setup and Operation Manual. Once the tables are complete, call Lutron Technical Support and select Startup. Please call 24 hours prior to desired system startup.

In the U.S., Canada, and the Caribbean: 1.800.523.9466

In Mexico: +1.888.235.2910 In Europe: +44.207.702.0657 In Asia: +65.6220.4666 In Japan: +81.355.758.411

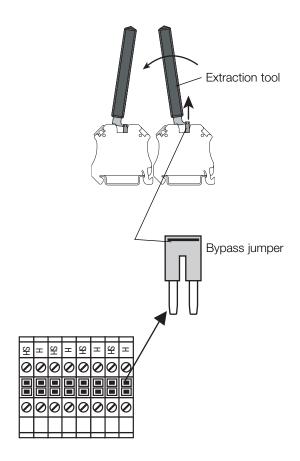
In all other countries: +1.610.282.6701

# **Remove Bypass Jumpers**

- **A.** After all load wiring has been checked, turn circuit breakers OFF.
- **B.** Remove and store the bypass jumpers for possible future use.
- C. Turn circuit breakers ON.



**Caution!** Reuse the bypass jumpers whenever work is being done on a load. Damage caused by short-circuits and miswiring is not covered by the product warranty.



Panel installation, control station wiring, and load activation are now complete.

Next Step: Refer to the Setup and Operation Manual to set up the functions and operation of the panel.



# **Notes**



# Warranty

#### Lutron Electronics Co., Inc. One Year Limited Warranty

For a period of one year from the date of purchase, and subject to the exclusions and restrictions described below, Lutron warrants each new unit to be free from manufacturing defects. Lutron will, at its option, either repair the defective unit or issue a credit equal to the purchase price of the defective unit to the Customer against the purchase price of comparable replacement part purchased from Lutron. Replacements for the unit provided by Lutron or, at its sole discretion, an approved vendor may be new, used, repaired, reconditioned, and/or made by a different manufacturer.

If the unit is commissioned by Lutron or a Lutron approved third party as part of a Lutron commissioned lighting control system, the term of this warranty will be extended, and any credits against the cost of replacement parts will be prorated, in accordance with the warranty issued with the commissioned system, except that the term of the unit's warranty term will be measured from the date of its commissioning.

#### **EXCLUSIONS AND RESTRICTIONS**

This Warranty does not cover, and Lutron and its suppliers are not responsible for:

- 1. Damage, malfunction or inoperability diagnosed by Lutron or a Lutron approved third party as caused by normal wear and tear, abuse, misuse, incorrect installation, neglect, accident, interference or environmental factors, such as (a) use of incorrect line voltages, fuses or circuit breakers; (b) failure to install, maintain and operate the unit pursuant to the operating instructions provided by Lutron and the applicable provisions of the National Electrical Code and of the Safety Standards of Underwriter's Laboratories; (c) use of incompatible devices or accessories; (d) improper or insufficient ventilation; (e) unauthorized repairs or adjustments; (f) vandalism; or (g) an act of God, such as fire, lightning, flooding, tornado, earthquake, hurricane or other problems beyond Lutron's control.
- 2. On-site labor costs to diagnose issues with, and to remove, repair, replace, adjust, reinstall and/or reprogram the unit or any of its components.
- 3. Equipment and parts external to the unit, including those sold or supplied by Lutron (which may be covered by a separate warranty).
- 4. The cost of repairing or replacing other property that is damaged when the unit does not work properly, even if the damage was caused by the unit. EXCEPT AS EXPRESSLY PROVIDED IN THIS WARRANTY, THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF ANY TYPE, INCLUDING ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. LUTRON DOES NOT WARRANT THAT THE UNIT WILL OPERATE WITHOUT INTERRUPTION OR BE FRROR FREF.

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