

XPS48－1204ML－20 shown

## Installation Guide Softswitch128тм（XPS）and GRAFIK Systemstм（XP）

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## 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

## Softswitch128тm (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 ${ }^{1,2}$

Omit for dual voltage
120 for 120 V ~
230 for $230 \mathrm{~V} \sim$ (CE)
240 for 220-240 V~ (non-CE)
277 for 277 V~

## Load Circuit Rating

16 A per circuit

## Custom Panel Suffix

Contact Lutron for options

## Rough-In Model Numbers

120/277 V~only
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 ${ }^{1,2}$

Omit for dual voltage
120 for 120 V ~
277 for 277 V~

## 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 $\mathrm{V} \sim$ only)
Feed Voltage
120 for 120 V ~
230 for 230 V ~ (CE)
240 for 220-240 V~ (non-CE)
277 for 277 V ~
347 for $347 \mathrm{~V} \sim$
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~
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~)
Custom Panel Suffix
Contact Lutron for options

## Frequency - All Model Numbers and Voltages

$50 / 60 \mathrm{~Hz}$

## Output Voltages

120 V~, 230 V~, 240 V~, 277 V~, or 347 V~
'Multiple voltages ( $120 \mathrm{~V} \sim$ and $277 \mathrm{~V} \sim$ ) 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.
${ }^{2}$ If voltage is not specified in the model number (e.g., XPS24-FT) product is rated $120 \mathrm{~V} \sim$ or 277 V~. Refer to Wiring section.

## Panel Model Number Guide (continued)

## GRAFIK Systems ${ }_{\text {тм }}$ (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 Voltage ${ }^{1,2}$

Omit for dual voltage
120 for 120 V ~
230 for 230 V ~ (CE)
240 for 220-240 V~ (non-CE)
277 for 277 V ~
347 for 347 V~

## Load Circuit Rating

16 A per circuit

## Custom Panel Suffix

Contact Lutron for options

## Rough-In Model Numbers

120/277 V~ 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 Voltage ${ }^{1,2}$
Omit for dual voltage
120 for 120 V ~
277 for 277 V~
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 ( $120 / 277 / 347 \mathrm{~V} \sim$ only)

## Feed Voltage

120 for 120 V ~
230 for 230 V ~ (CE)
240 for 220-240 V~ (non-CE)
277 for 277 V~
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~)
Custom Panel Suffix
Contact Lutron for options

Frequency - All Model Numbers and Voltages
$50 / 60 \mathrm{~Hz}$

## Output Voltages

$120 \mathrm{~V} \sim, 230 \mathrm{~V} \sim, 240 \mathrm{~V} \sim, 277 \mathrm{~V} \sim$, or $347 \mathrm{~V} \sim$
'Multiple voltages ( $120 \mathrm{~V} \sim$ and $277 \mathrm{~V} \sim$ ) 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.
If voltage is not specified in the model number (e.g., XPS24-FT) product is rated $120 \mathrm{~V} \sim$ or 277 V~. Refer to Wiring section.

## Panel Dimensions

## Mini Panel

Dimensions are in inches (mm).


## Panel Dimensions (continued)

## Standard Panel

Dimensions are in inches (mm).


## Panel Dimensions (continued)

Large Panel (120/277/347 V~ only)
Dimensions are in inches (mm).


## Panel Dimensions (continued)

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

Dimensions are in inches (mm).



Left Side


Right Side


Bottom View

## 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 $32-104{ }^{\circ} \mathrm{F}$ $\left(0-40^{\circ} \mathrm{C}\right)$.
- 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 $(1.8 \mathrm{~m})$ from audio or electronic equipment and associated wiring.
- Mount within $7^{\circ}$ 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

| Mini | 30 pounds $(13.9 \mathrm{~kg})$ |
| :--- | :--- |
| Standard | 80 pounds $(37 \mathrm{~kg})$ |
| Large | 135 pounds $(61.3 \mathrm{~kg})$ |
| Extra-Large | 200 pounds $(90.7 \mathrm{~kg})$ |

Recommended Mounting Heights*
(120/277/347 V~ Softswitch128 systems)
Mini $\quad 45 \mathrm{in} .(1143 \mathrm{~mm})$
Standard 25 in. ( 635 mm )
Large $\quad 10 \mathrm{in}$. ( 254 mm )
Extra-Large 7 in. ( 178 mm )
*Measure from floor to bottom of panel. Provides optimal viewing height for controller.


## Rough-In Panel Interior Mounting (Rough-in Panels ONLY) (120/277/347 V~ 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).



## Wiring

## 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.)


## Wire Sizes

- Power Feed (Hot/Live): \#14-\#10 AWG (2.5-4.0 mm²)
- Switched Hot/Live: \#14-\#10 AWG (2.5-4.0 mm²)


## 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 $230 \mathrm{~V} \sim$ and $240 \mathrm{~V} \sim$ panels, "Hot" is referred to as "Live". Therefore, terminals will be labeled $L$ and SL.


## Typical load circuit



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

4
Wire to either the 120 V ~ 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.


## Panel with Branch Circuit Breakers: Feed and Load Wiring (120/277/347 V~ only)



Feed Wiring
Wire Sizes

| $120 \mathrm{~V} \sim$ | \#4 AWG to $250 \mathrm{KCMIL}(\mathrm{MCM})\left(25-185 \mathrm{~mm}^{2}\right)$ |
| :--- | :--- |
| $277 \mathrm{~V} \sim$ | \#4 AWG to $250 / 350 \mathrm{KCMIL}(\mathrm{MCM})\left(25-120 / 185 \mathrm{~mm}^{2}\right)$ |
| $347 \mathrm{~V} \sim$ | \#4 AWG to $250 / 350 \mathrm{KCMIL}(\mathrm{MCM})\left(25-120 / 185 \mathrm{~mm}^{2}\right)$ |

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



## Wire Sizes

230 V~ \#14-\#2 AWG (2.0-35 mm²)
$220-240 \mathrm{~V} \sim$ \#14-\#10 AWG (2.0-4.0 mm²)

## System Wiring Overview

Review the options below for information on wiring your panel correctly into your specific system.
A. Softswitch128тм (XPS) panel: Refer to the

Softswitch128 Setup and Operation Manual for detailed wiring information.

B. GRAFIK Systems ${ }_{\text {tм }}$ (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.


To other panels, GRAFIK Eye control units, wallstations, or control interfaces
Correct: Daisychain OK


Incorrect: Branch, T-tap, or home run not acceptable


Circuit Selector Terminals
C. GRAFIK Systemstm (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.


## Ratings

## Softswitch128тм (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~Panels <br> with Branch Circuit Breakers

| XPS | Switch <br> Legs | Feed <br> Type | Max <br> Feedel |
| :--- | :--- | :--- | :--- |
| XPS8 | 8 |  |  |
| XPS12 | 12 | 304 W or |  |
| XPS16 | 16 | $103 W$ | 200 A |
| XPS20 | 20 |  |  |
| XPS24 | 24 | Main Lug Accepts: |  |
| XPS28 | 28 | \#4 AWG to 250 |  |
| XPS32 | 32 | KCMIL (MCM) |  |
| XPS36 | 36 | (25-120 mm²) | 225 A |
| XPS40 | 40 |  |  |
| XPS42 | 42 |  |  |

277 V~ Panels
with Branch Circuit Breakers

| XPS <br> Model | Switch <br> Legs | Feed <br> Type | Max <br> 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 mm²) |  |


| $\mathbf{2 2 0 - 2 4 0} \mathbf{V} \sim$ and $\mathbf{2 3 0} \mathbf{V} \sim$ Panels |  |  |  |
| :--- | :--- | :--- | :--- |
| with Branch Circuit Breakers |  |  |  |
| XPS | Switch | Feed | Max |
| Model | Legs | Type | Feed |
| XPS8 | 8 | $3 \varnothing 4 W$ |  |
| XPS12 | 12 | Isolation Switch |  |
| XPS16 | 16 | Accepts: | 125 A |
| XPS20 | 20 | $\# 14-\# 2$ AWG |  |
| XPS24 | 24 | $\left(2.0-35 \mathrm{~mm}^{2}\right)$ |  |


| Feed-Through (FT) and Rough-In (RI) |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| FT <br> Model | RI Model | Switch Legs | Feed Type | $\begin{aligned} & \hline \text { Max } \\ & \text { Feed } \end{aligned}$ |
| XPS8 | SINT8 | 8 |  |  |
| XPS12 | SINT12 | 12 | 102 W |  |
| XPS16 | SINT16 | 16 |  |  |
| XPS20 | SINT20 | 20 | \#14-\#10 AWG |  |
| XPS24 | SINT24 | 24 | (2.5-4.0 | 20 A |
| XPS28 | SINT28 | 28 | $\mathrm{mm}^{2}$ ) |  |
| XPS32 | SINT32 | 32 |  |  |
| XPS36 | SINT36 | 36 |  |  |
| XPS40 | SINT40 | 40 |  |  |
| XPS44 | SINT44 | 44 |  |  |
| XPS48 | SINT48 | 48 |  |  |

## Ratings (continued)

## GRAFIK Systemsтм (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.

| $\mathbf{1 2 0}$ V~ Panels |  |  |  |
| :--- | :--- | :--- | :--- |
| with Branch Circuit Breakers |  |  |  |
| XP | Switch | Feed | Max |
| Model | Legs | Type | Feed |
| XP4 | 4 |  |  |
| XP8 | 8 |  |  |
| XP12 | 12 | 304 W or |  |
| XP16 | 16 | $103 W$ | 200 A |
| XP20 | 20 |  |  |
| XP24 | 24 | Main Lug Accepts: |  |
| XP28 | 28 | \#4 AWG to 250 |  |
| XP32 | 32 | KCMIL (MCM) |  |
| XP36 | 36 | (25-120 mm²) | 225 A |
| XP40 | 40 |  |  |
| XP42 | 42 |  |  |

277 V~ Panels
with Branch Circuit Breakers

| XP | Switch <br> Legs | Feed <br> Type | Max <br> Feed |
| :--- | :--- | :--- | :--- |
| XP4 | 4 |  |  |
| XP8 | 8 | 3Ø 4W or 1 $1 \varnothing$ 3W |  |
| XP12 | 12 | Main Lug Accepts: |  |
| XP16 | 16 | \#4 AWG to 250 | 250 A |
| XP20 | 20 | KCMIL (MCM) |  |
| XP24 | 24 | (25-120 mm²) |  |
| 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~ and 230 V~ Panels with Branch Circuit Breakers

| XPS | Switch <br> Legs | Feed <br> Type | Max <br> Feeded |
| :--- | :--- | :--- | :--- |
| XPS8 | 8 | $3 \varnothing$ 4W |  |
| XPS12 | 12 | Isolation Switch |  |
| XPS16 | 16 | Accepts: | 125 A |
| XPS20 | 20 | \#14-\#2 AWG |  |
| XPS24 | 24 | $\left(2.0-35 \mathrm{~mm}^{2}\right)$ |  |

Feed-Through (FT) and Rough-In (RI) Panels (120 V~, 277 V~, 120/277 V~)

| FT <br> Model | RI <br> Model | Switch <br> Legs | Feed <br> Type | Max <br> Feed |
| :--- | :--- | :--- | :--- | :--- |
| XP4 | XINT4 | 4 |  |  |
| XP8 | XINT8 | 8 | 102 W |  |
| XP12 | XINT12 | 12 |  |  |
| XP16 | XINT16 | 16 | \#14-\#10 AWG |  |
| 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 $\left(2.5-4.0 \mathrm{~mm}^{2}\right)$ 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.


Bypass jumper protects the switch module 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
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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 .


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. <br> 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.

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## TO MAKE A WARRANTY CLAIM

To make a warranty claim, promptly notify Lutron within the warranty period described above by calling the Lutron Technical Support Center at (800) 523-9466. Lutron, in its sole discretion, will determine what action, if any, is required under this warranty. To better enable Lutron to address a warranty claim, have the unit's serial and model numbers available when making the call. If Lutron, in its sole discretion, determines that an on-site visit or other remedial action is necessary, Lutron may send a Lutron Services Co. representative or coordinate the dispatch of a representative from a Lutron approved vendor to Customer's site, and/or coordinate a warranty service call between Customer and a Lutron approved vendor.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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