

LowProfile.

Surge Protective Devices

LowProfile Series: 080 and 120

Installation, Operation and Maintenance Manual



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BEFORE INSTALLATION



WARNING: HAZARDOUS VOLTAGES PRESENT Improper installation or misapplication may result in serious personnel injury and/or damage to electrical system. Read the complete installation instructions before proceeding with installation. Remove all power to the electrical panel before installing or servicing the surge protective device (SPD).



IMPORTANT SAFETY INSTRUCTIONS All work must be performed by licensed and qualified personnel. The electrical system must be properly grounded in accordance with the U.S. National Electrical Code, state and local codes or other applicable codes for this SPD to function properly. Do not connect LowProfile (LP) to the line side of the main service breaker or disconnecting means. This device is suitable for installation where the available short circuit current is 200,000 rms symmetrical amperes at 600VAC or less.

1. System Configuration Verification

Confirm that the voltage(s) and service configuration shown on the LowProfile product label are consistent with the voltage and service configuration of the facility. A model number is on the label on the side of the LowProfile unit. Each model number corresponds to the configurations printed in the table below:

Example of LowProfile model number: TK-LP080-3Y208-FL

MODEL NUMBER	NOMINAL VOLTAGE	L-N VOLTAGE RANGE	L-L VOLTAGE RANGE	CONFIGURATION
TK-LPxxx-1S240-L	120/240	108-132	216-264	Split-Phase, 3-wire+ground
TK-LPxxx-3Y208-L	120/208	108-132	187-229	Three-Phase WYE, 4-wire+ground
TK-LPxxx-3Y480-L	277/480	249-305	432-528	Three-Phase WYE, 4-wire+ground

xxx denotes surge rating per phase (080, or 120) Enhanced Transient Filter: add suffix "-F"



WARNING: Check to ensure that a proper bond is installed between neutral and ground at the transformer upstream from all 3-phase WYE or split-phase LowProfile device (See NEC Article 250). If the transformer is not accessible, check the main service disconnect/panel for the N-G bond. Lack of a proper bond will damage LowProfile and void the warranty.

2. Wiring Connection Diagrams

Figures 1-2 show the electrical relationship between LowProfile and these two basic service configurations: Split phase, 3 wire and Three phase, 4 wire WYE.

FIG. 1: Split Phase, 3-Wire

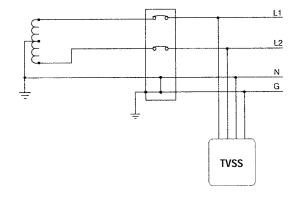
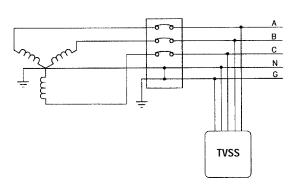


FIG. 2: 3-Phase, 4-Wire WYE



Connections to the SPD are clearly identified. Connections are made via pigtail leads supplied with the unit. For 3 phase units phases A, B and C are black wires, which are marked "A/L1", "B" and "C/L2" respectively. For split phase units, the phase connections are marked "A/L1" and "C/L2". The neutral is a white wire and the ground is a green wire.

3. Upstream Over-Current Protection Device

LowProfile must be connected in parallel with the electrical system. All LowProfile units come standard with component-level over-current fusing rated at 200,000 rms symmetrical amperes at 600VAC. The SPD can be connected directly to the electrical system bus and does not require an upstream over-current protection device.

4. Conductor Routing



CAUTION: LowProfile's performance will be limited severely if the conductors are (a) too long, (b) are of too small a wire gauge, (c) have too many bends or (d) have sharp bends.

The factors listed above should be addressed during the design of an installation to reserve a suitable place for LowProfile next to its point of connection to the electrical system. The selected mounting location should allow for the shortest possible conductor runs and a direct route with a minimum of bends. If bends are required, they should be sweeping bends. Do not make sharp 90° bends for appearance purposes because they will severely decrease the effectiveness of LowProfile.

Binding or twisting conductors together using tie-wraps or electrical tape increases the protection performance of the device.

5. Conduit Openings

All LP units come with a 3/4" conduit hub and chase nipple. There are three conduit openings located in top, top left, and top right sides of the enclosure. The hub can be installed in any of the three openings. The remaining unused openings can be covered with supplied knock-out seals.

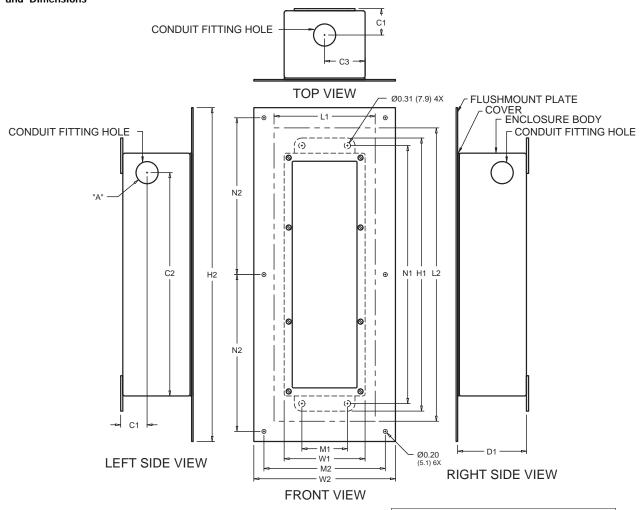
6. Mounting

LowProfile can be mounted in a variety of methods. The basic method is to wall mount using the mounting feet attached to the base of the enclosure. LowProfile can also be mounted even (or flush-mount) to the exterior wall surface. Mount LowProfile using construction methods and hardware appropriate for your site. Install the conduit hub, chase nipple and pull conductors as specified above or according to the engineer's design. See Figure 3 for enclosure and mounting dimensions.

7. Flush-Mount Plate

LowProfile comes with a flush-mount plate for optional flush-mount installation. Typically a cutout, larger than the LowProfile enclosure, is created in the drywall or other finish material. See Figure 3 for the recommended cutout gap (dimensions L1 and L2). Use the flush-mount plate to hide the gap between the enclosure and the cutout edges. Prior to installation, attach the plate to the enclosure using the existing cover screws.

Fig. 3 Conduit Openings, Enclosure Mounting, and Dimensions



							CONDUIT	FITTING	
	OVERALL	DIMENSIONS	- IN (mm)	MOUNTING HOLES		TRADE SIZE		LOCATIONS	
MODEL SERIES	H1	W1	D1	M1	N1	А	C1	C2	C3
TK-LP080/120	13.50 (342.9)	4.00 (101.6)	3.50 (88.9)	2.25 (57.2)	12.75 (323.9)	3/4 (19.0)	1.31 (33.3)	11.04 (280.4)	2.00 (50.8)
							WALL CUTOUT		
	H2	W2		M2	N2		L1	L2	
FLUSHMOUNT PLATE	16.50 (419.1)	7.00 (177.8)		6.00 (152.4)	7.75 (196.9)		5.00 (127)	15.50 (368.3)	

CONNECTION AND WIRING INSTRUCTIONS

1. Phase, Neutral, and Ground Connections

NOTE: In order to connect the LowProfile unit, it will be necessary to remove the cover of the unit. Use care when removing the cover, as there are wires, which run from components on the cover to inside the enclosure of the SPD. The monitor board (located on the backside of the cover) has a cable harness connected to it which routes into the enclosure.



CAUTION: Prior to installation ensure the system configuration and voltage is equivalent to the LowProfile unit being installed.

Following all applicable National Electrical Code standards as well as state and local codes, connect phase, neutral and ground to LowProfile. Ensure that the conductor lengths are kept as short and straight as possible.

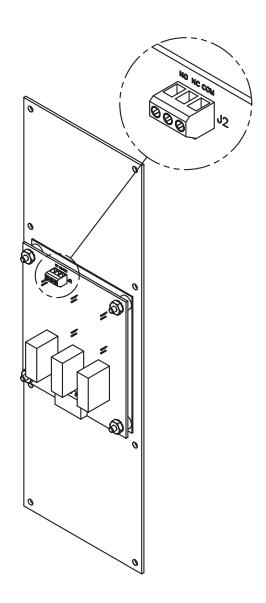
2. Connecting Form C Dry Contacts

All LowProfile units come standard with one set of Form "C" dry relay contacts for the SPD status. These contacts are for connection to a user-provided remote alarm and monitoring circuit. The relay contacts are rated 150VDC/125VAC with maximum switching power of 30WDC/60VA AC. See Figure 4 for the form C contact configuration and terminal location on the monitor board. The annotations on the diagram match the markings on the terminal block.

When input power is present on all phases, terminals "NC" and "COM" are an open circuit and terminals "NO" and "COM" are a closed circuit. The contacts change state when the unit has encountered failure to one or more phases.

The installer must provide the appropriate raceway and wiring for the monitoring circuit, observing the restrictions and conduit openings illustrated in an earlier section of this manual. The installer must route the monitoring conductors to the terminal blocks on the lid-mounted main monitoring board. Route the wires to allow the lid to be opened and closed properly. Tighten screws on terminals to 3.5 in-lbs (0.4 Nm). This terminal block will accept wire sizes #28AWG to #16AWG.

Fig. 4 Remote Monitoring Terminal Block (Contacts shown in shelf state. Contacts change state upon application of input voltage)



3. Neutral to Ground Filter Jumper

All LowProfile models with enhanced filter (model numbers end with "-F" suffix) come with a green jumper wire, which loops out of the epoxy and connects the filter from neutral to ground. In certain medical applications or circuits which employ GFCI protection, this Neutral to Ground filter connection should be removed.



WARNING: Prior to proceeding, ensure the LowProfile unit does not have voltage applied to its input terminals

Removal is accomplished by cutting the green jumper wire. Once cut, both ends should be properly separated and insulated to prevent the ends from making inadvertent electrical contact.

4. Verification and Power Up

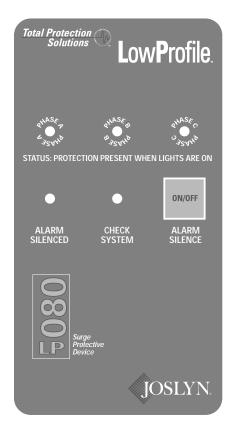


WARNING: It is recommended that the cover of the LowProfile unit along with its associated cabling be installed prior to applying power. The monitoring harness, which exits the epoxy and connects to J1 on the monitor board, contains line voltage when power is applied to the unit.

Apply power to LowProfile by closing the switch feeding the SPD.

Verify that all "Phase Protection Status" indicating lights are illuminated. The "Check System" indicating light illuminates only upon failure of one or more phases (indicating an alarm condition). Audible alarm should not operate under normal conditions. The audible alarm can be "muted" by pressing the "ALARM SILENCE" button, which subsequently will illuminate the "ALARM SILENCED" light. Pressing the "ALARM SILENCE" button again will enable the alarm.

Fig. 5 SPD Diagnostic



TROUBLESHOOTING

Your LowProfile system does not require scheduled maintenance. The unit's heavy-duty construction is designed to provide years of uninterrupted service. The unit contains no serviceable parts.

INDICATION	PROCEDURE
One or more phase protection status indicating lights are off, check system indicating light is on and form C alarm contacts have changed state	Verify that the input power feeding LowProfile is energized using a voltage tester. If power is present, contact factory for assistance: 800-647-1911

TECHNICAL ASSISTANCE

Our staff is ready to support you and answer any questions. Monday through Friday, 8:00 a.m. to 5:00 p.m. (EST) at 800-647-1911

RETURNS AND WARRANTY PROCEDURES

LowProfile products are warranted for the life of the unit. In the event that any module or subassembly within the SPD fails to perform, call our Technical Support at 800-647-1911 to obtain a Return Material Authorization number. We will immediately ship a replacement for the defective parts free of charge (installation labor and site preparation excluded). Return the defective parts to Joslyn within 30 days of receiving the replacement. Failure to return the defective parts will result in billing for the replacement parts. To help expedite the return procedures, please have the following information at hand when you contact Joslyn:

INFORMATION	EXAMPLE
Model Number	TK-LP240-3Y208-L
Serial Number	15478-0104-001
Date of Purchase	January 2, 2004
Sales Order Number	15478
Description of Failure	"Check System" indicating light illuminated
Desired Action from Joslyn	Replace

WARRANTY STATEMENT

During the applicable warranty period, any Total Protection Solutions™ surge protective device which fails due to defect in materials, workmanship, or any electrical anomaly, including lightning, shall be repaired or replaced at Joslyn's discretion. In the event of a return, the device must be shipped FOB Joslyn place of business within the applicable warranty period. The applicable warranty period for this Joslyn surge protective device is outlined below in the <u>Warranty Period</u> section. The warranty period for any repaired devices or replacement devices will be only the remaining portions of the original limited warranty.

A Return Material Authorization (RMA) number must be obtained from the Company's Customer Service department before returning any Products.

The Company shall have no liability under this warranty for problems or defects directly or indirectly caused by misuse of the Product, alteration of the Product (including removal of any warning labels), accidents, improper installation, application, operation or improper repair of the Product.

THIS WARRANTY REPRESENTS THE ENTIRE WARRANTY OF THE COMPANY. ALL OTHER WARRANTIES EXPRESS OR IMPLIED, ORAL OR WRITTEN, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

THE LIABILITY OF THE COMPANY, AT ITS SOLE OPTION, UNDER THIS WARRANTY IS EXPRESSLY LIMITED TO THE REPLACEMENT OR REPAIR OF THE DEFECTIVE PART THEREOF. IN NO EVENT SHALL THE COMPANY BE LIABLE OR RESPONSIBLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND OR CHARACTER, NOR SHALL ITS LIABILITY EVER EXCEED THE PURCHASE PRICE PAID TO JOSLYN FOR SUCH DEFECTIVE PRODUCT.

This warranty is not transferable and may only be enforced by the original purchaser. Claims under this warranty must be submitted to Joslyn within thirty (30) days of discovery of any suspected product defect.

Warranty Period

LowProfile

30 Years from original date of purchase



INSTALLATION NOTES	



