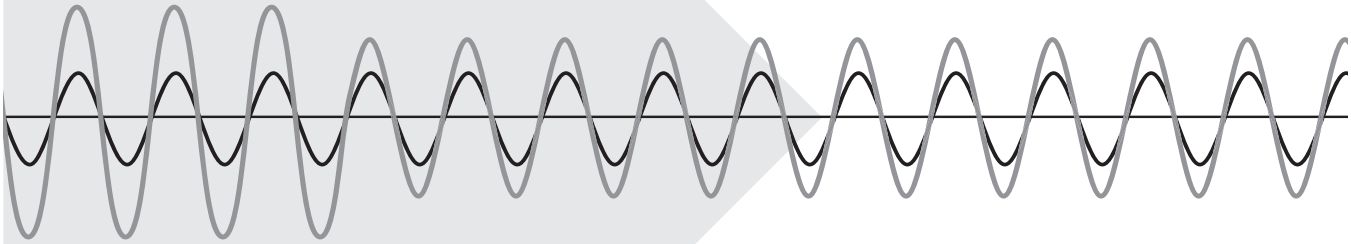
JSP™ SURGE PROTECTION

JSPR™ SURGE PROTECTION

Joslyn

Installation, Operation and Maintenance Manual

PN 750-0100-001 B00



Surge Protective Devices

JOSLYN®

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Guide to Installation and Assistance

Thank you for choosing the Joslyn® JSP™ Series Surge Protective Device (SPD). We look forward to fulfilling your facilitywide surge protection needs.

Should you have questions about installing the JSP Series please call Joslyn® Technical Support at 800.238.5000 or 804.236.3300 Monday through Friday, 8:00 a.m. to 5 p.m. (EST). Or, email us at joslyn@tnbpowersolutions.com.

This manual provides guidelines for the proper installation of the JSP Series of devices. Proper product selection and compliance with these guidelines will help your new suppression system provide years of reliable service. If installers are unsure about the facility electrical configuration or have other installation-related questions, it is recommended they consult with a master electrician or other qualified electrical professional.

When shortcuts are taken or installation procedures are not followed, the JSP Series may become damaged or may not provide adequate protection. It is extremely important to follow these installation procedures carefully.

△ W A R N I N G !
THE JSP SERIES WARRANTY IS VOIDED if the unit is damaged as a result of improper installation or the installer's failure to verify the following conditions prior to installation.

△ W A R N I N G !
HAZARDOUS VOLTAGES PRESENT: Improper installation or misapplication may result in serious personal injury or damage to the electrical system. Read the complete installation instructions before proceeding with installation. Remove all power to the electrical panel before installing or servicing the SPD.

△ W A R N I N G !
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. This device is suitable for installation where the available short circuit current is 200,000 rms symmetrical amperes up to 600VAC or less. For countries outside of the US follow applicable electrical specifications for the country the unit is being used in.

△ W A R N I N G !
Check to ensure that a proper bond is installed between neutral and ground at the transformer upstream from all 3-Phase Wye, 3-Phase High-Leg Delta or Split-Phase JSP Series device (See NEC Article 250). If the transformer is not accessible, check the main service disconnect/panel for the NG bond. Lack of a proper bond will damage JSP Series and void the warranty.

△ W A R N I N G !
Do not HIPOT the JSP Series units or the electrical system to which the JSP Series unit is connected without disconnecting the JSP Series units conductors including phases, neutral and ground.

Pre-Installation Checklist ☑

☐ Confirm that the voltage(s) and service configuration shown on the JSP Series product label are consistent with the voltage and service configuration of the facility. A model number is on the right side of the JSP Series unit. Each model number corresponds to the configurations printed in Table 1:

Example of a SPD model number: JSP(R)160-3Y208-F

Sample Model Number Scheme

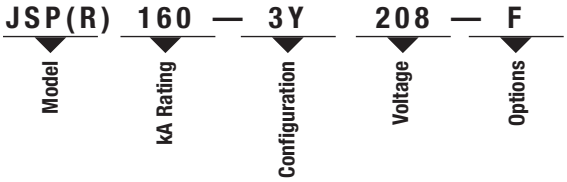


Table 1: Configuration Table

MODEL	NOMINAL VOLTAGE RANGE	L-N VOLTAGE RANGE	L-L VOLTAGE	CONFIGURATION
JSP(R)xxx-1P120[1]	120	90-132	90-132	1-Phase, 2-Wire + Ground
JSP(R)xxx-1P240[1]	240	180-264	180-264	1-Phase, 2-Wire + Ground
JSP(R)xxx-1S240[1]	120/240	90-132	180-280	Split-Phase, 3-Wire + Ground
JSP(R)xxx-3Y208[1]	120/208	312-382	540-660	3-Phase, 4-Wire + Ground
JSP(R)xxx-3Y380[1]	220/380	198-253	342-440	3-Phase, 4-Wire + Ground
JSP(R)xxx-3Y415[1]	240/415	216-264	373-457	3-Phase, 4-Wire + Ground
JSP(R)xxx-3Y480[1]	277/480	249-305	432-528	3-Phase, 4-Wire + Ground
JSP(R)xxx-3H240[1]	120/240	108-132 (A, C) 187-229 (B)	216-264	3-Phase, High-Leg 4-Wire + Ground
JSP(R)xxx-3Y600	347/600	313-394	540-660	3-Phase Wye, 4-Wire + Ground
JSP(R)xxx-3D240[1]	240	N/A	216-264	3-Phase Delta, 3-Wire + Ground
JSP(R)xxx-3D380	380	N/A	342-418	3-Phase Delta, 3-Wire + Ground
JSP(R)xxx-3D480	480	N/A	432-528	3-Phase Delta, 3-Wire + Ground
JSP(R)xxx-3D600	600	N/A	540-660	3-Phase Delta, 3-Wire + Ground

JSP Series Options

F	Transient filter that meets UL 1283 (Not recommended when using telecommunication rectifiers)
B	Surge Counter (not available on JSP 60–100kA units or the JSPR series)
S	NEMA 4X stainless steel enclosure
M	Advanced monitoring (available in 60–100kA units only)

[1]These are the only voltages available on the 60, 80, and 100kA systems.

NOTES:

- *xxx denotes surge rating per phase (60, 80, 100, 120, 160, 200, 240, 300, 400)*
- *JSPR units are only available in 120 and 160kA.*
- *The power system operation frequency is between 47–63Hz.*

☐ Confirm that the environmental conditions are consistent with the following ranges:

- Ambient Temperatures: Between -40° and +158°F (-40º to 70º C).
- Relative Humidity: Between 5% and 95% non-condensing.
- Altitude: Less than 13,000 feet (4000 m).

Service Configurations

Figures 1–5 show the electrical relationship between JSP Series unit and these five basic service configurations: Single-Phase, 2-Wire; Split-Phase, 3-Wire; 3-Phase, 4-Wire Wye; 3-Phase, 3-Wire Delta and 3-Phase, 4-Wire High-Leg Delta.

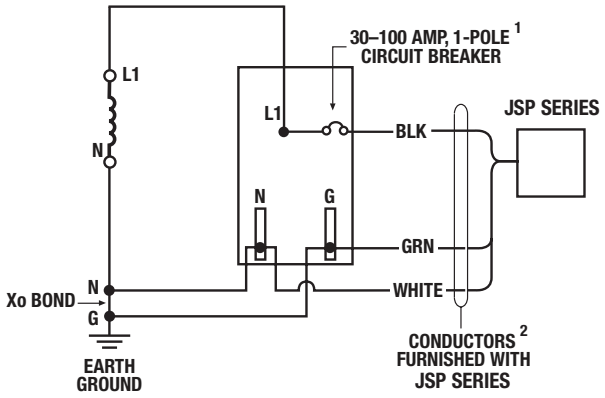


Figure 1
Single-Phase, 2-Wire

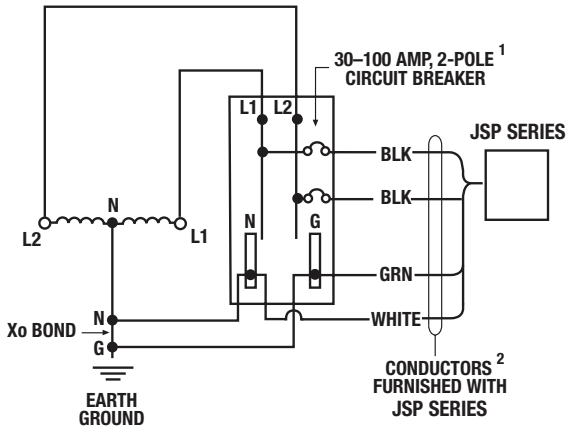


Figure 2
Split-Phase, 3-Wire

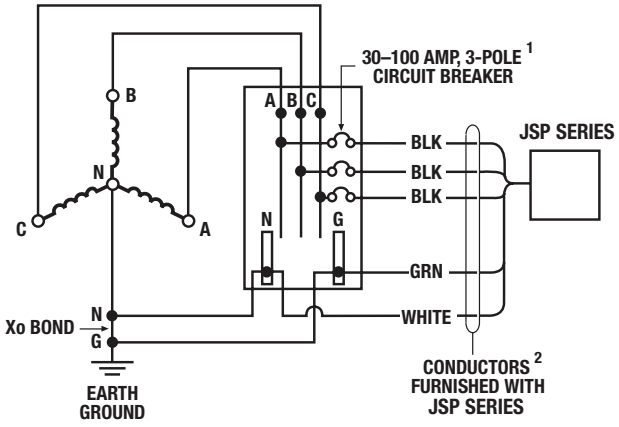


Figure 3
3-Phase, 4-Wire Wye

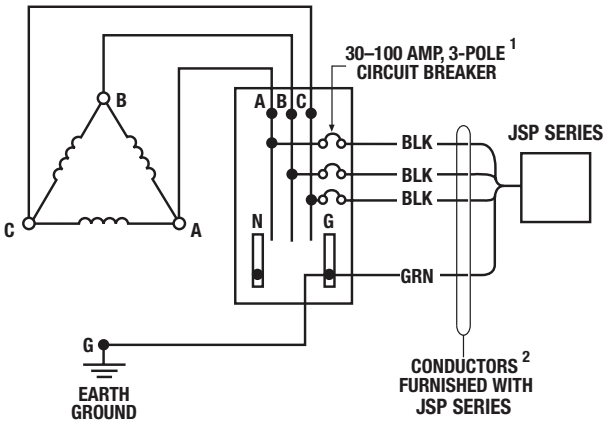


Figure 4
3-Phase, 3-Wire Delta

Continued

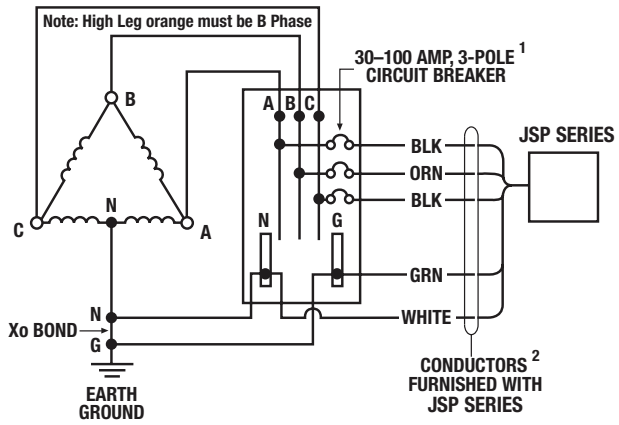


Figure 5
3-Phase, 4-Wire High-Leg Delta

1 All JSP Series units can be connected without an upstream breaker/fuse.
2 JSP 60 through 100kA and all JSPR units are furnished with #10AWG leads.

Conductor Sizing & Routing

△ CAUTION: The JSP Series unit'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. For optimum performance never exceed 10' conductor lengths.

The factors listed above should be addressed during the design of an installation to reserve a suitable place for the JSP Series unit 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 JSP Series unit.

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

The conductor length should be as short as possible to ensure the maximum level of protection. Wires are marked with (Phase A, B, C, Line 1, Line 2, Neutral or Ground) depending on the model.

Conductor Sizing & Routing (JSP)

Joslyn recommends installing the JSP unit by following conductor size for phase, ground and neutral connections. The conductor length should be as short as possible to ensure the maximum level of protection.

Table 2: Maximum Recommended Conductor Size

JSP Models	Conductor size
JSP-120	#6AWG
JSP-160	#6AWG
JSP-200	#4AWG
JSP-240	#4AWG
JSP-300	#4AWG
JSP-400	#4AWG

- *60 through 100kA units are shipped with #10AWG leads. Leads should be shortened during installation in order to minimize conductor length.*
- *120 through 400kA units are shipped with compression box lugs. The set screws on the box lugs should be torqued to 20 in-lbs.*
- *Terminals are identified with markers (Phase A, B, C, Line 1, Line 2, Neutral or Ground)*

Upstream Overcurrent Protection Device

The JSP Series unit is a Type 1 SPD which is suitable for use in both Type 1 and Type 2 SPD applications. The JSP Series unit is a one-port SPD and is to be connected in parallel with the electrical system. It may be connected via a circuit breaker, molded case switch, fused switch, or connected directly to the bus of the panelboard or switchboard it is protecting. If direct bus connection is used, Joslyn® recommends installing the JSP Series unit behind a disconnect switch or other disconnecting means for ease of serviceability.

If the SPD is connected to a dedicated OCPD, a 60A breaker is recommended (30A minimum, 200A maximum).

Mounting (JSP)

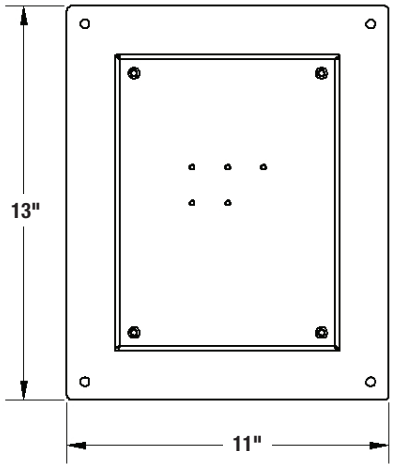
Mount the JSP to the building structure using construction methods and hardware appropriate for your site. Install the conduit and pull the conductors as specified in Table 2.

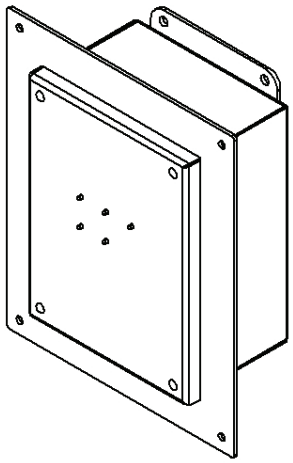
Mounting (JSPR)

Mount the JSPR to the building structure using construction methods and hardware appropriate for your site.

Mount the JSPR into the wall. Electrician can mount to the back wall, if the back wall is made of structural material such as masonry or plywood. (Drywall is not a structural material). If back wall is not made of structural material, the electrician can create brackets to hold the SPD to the adjacent studs.

After the drywall has been installed, install Flush Mounting Plate (FMP) by first removing the JSPR enclosure lid. Place the FMP over enclosed body. Attached the FMP to the wall using the enclosed hardware kit. Screw the lid back on to the enclosure body.





JSPR 120, 160 Weight: 30 lbs. (13.6 kg)

Indoor vs. Outdoor Installations

NEMA 4 enclosures are suitable for indoor or outdoor use. NEMA 4X (stainless steel) enclosures are suitable for corrosive environments as well. For direct sunlight applications, Joslyn suggests shading the monitoring components. All conduits and fittings must be rated and properly installed so that the final installation maintains the NEMA rating.

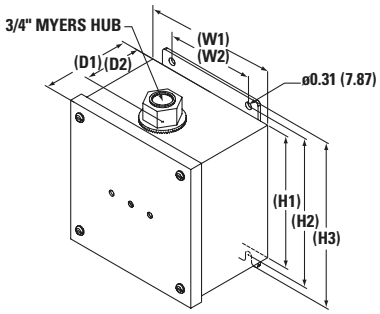
Conduit Openings (JSP)

If desired, punch holes at this time for the conduit or nipple or wait until the JSP unit is mounted to the building structure. Punch holes only in the designated areas as shown in the following illustration.

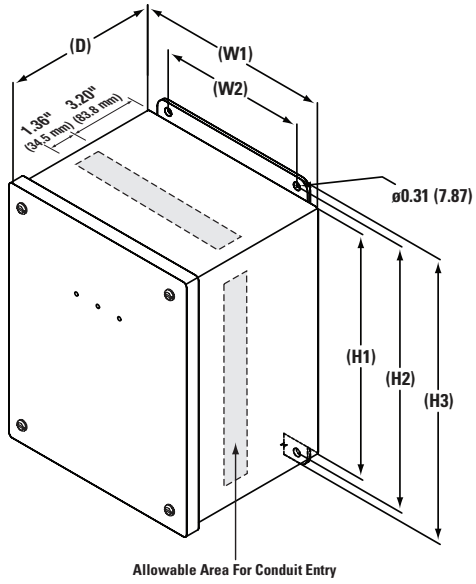
Conduit Openings (continued)

△ CAUTION: Careful consideration must be made when selecting an area for conduit entry. There are several components inside the enclosure that may interfere with the conduit entry path, therefore, ensure the path is clear of all objects before drilling. Damages caused by installation errors are not covered under the product warranty. See Figures 6A and 6B for conduit openings and enclosure dimensions.

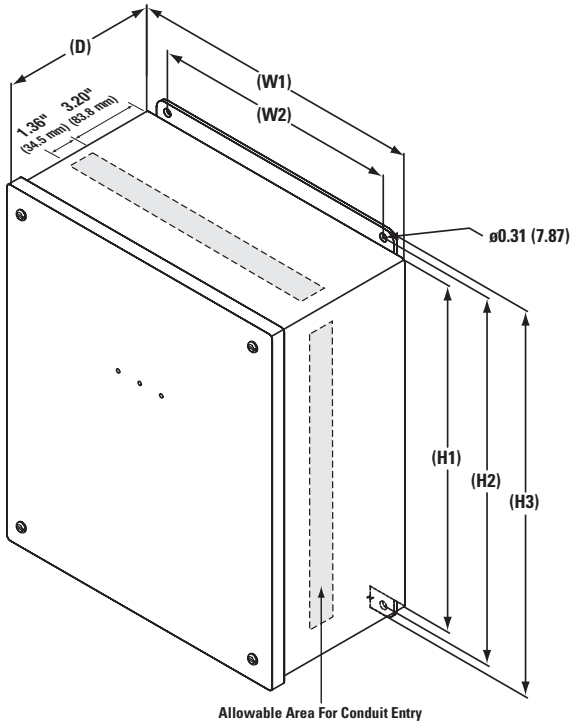
Figure 6A
Conduit Openings and Enclosure Mounting Dimensions (JSP)



JSP 60–100



JSP 120–160

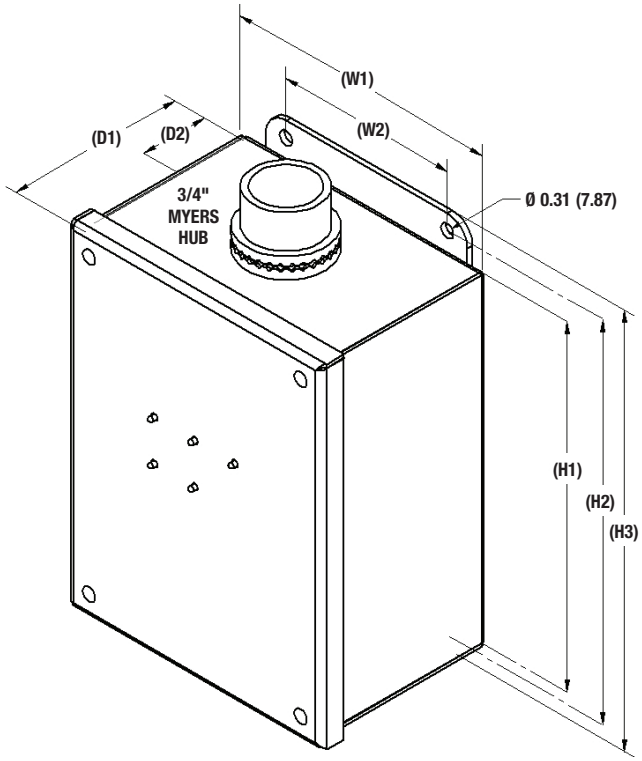


JSP 200–400

DIMENSIONAL SPECIFICATIONS

Dim	JSP 60, 80, 100	JSP 120, 160	JSP 200, 240, 300, 400
H1	6.00 (152.4)	10.00 (254.0)	14.00 (355.6)
H2	6.75 (171.5)	10.75 (273.1)	14.75 (374.7)
H3	7.50 (190.5)	11.50 (292.1)	15.50 (393.7)
W1	6.00 (152.4)	8.00 (203.2)	12.00 (304.8)
W2	4.00 (101.6)	6.00 (152.4)	10.00 (254.0)
D	–	6.20 (157.5)	6.20 (157.5)
D1	4.16 (105.7)	–	–
D2	2.00 (50.8)	–	–
All measurements in inches (mm)			

Figure 6B
Enclosure Mounting Dimensions (JSPR)



Dim	JSPR 120, 160
H1	10.00 (254.0)
H2	10.75 (273.1)
H3	11.50 (292.1)
W1	8.00 (203.2)
W2	6.00 (152.4)
D1	4.20 (106.9)
D2	2.00 (50.8)
Weight	30 (13.6)

All measurements in inches (mm) and pounds (kg)

Electrical Connections

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

Following all applicable National Electrical Code standards as well as state and local codes, connect phase, neutral* (white wires) and ground (green wires) to the JSP Series unit.

JSPR units come with 36" of #10AWG conductors. Each phase conductor is labeled (Phase A, B or C). Ensure that the conductor lengths are kept as short and straight as possible. On all high-leg delta systems, the high-leg (208V LN) must be connected to the Phase B of the SPD. (Color coded orange according to NEC).

**The 3-Wire + Ground Delta JSP Series units do not have a neutral conductor.*

Connecting Form "C" Dry Contacts

Units that come with Form "C" dry relay contacts provide status of the surge protective device. These contacts are for connection to a user-provided remote alarm and monitoring circuit. The relay contacts are rated 65VDC/150VAC with maximum switching power of 30WDC/60VA AC. The Form "C" contacts come pre-wired with 36" of #20AWG conductors on the JSP 60 to 100kA models and on all JSPR models.

When input power is present on all phases, terminals "NO" (Normally Open) and "COM" (Common) are an open circuit and terminals "NC" (Normally Closed) 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.

Remote Monitoring

Figure 7
Wire Connections
Contacts shown in de-energized state (alarm condition).

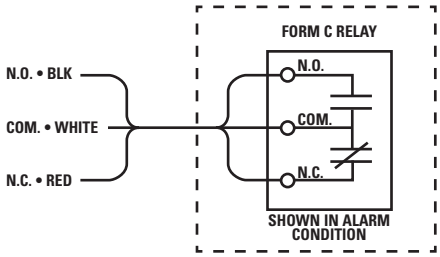
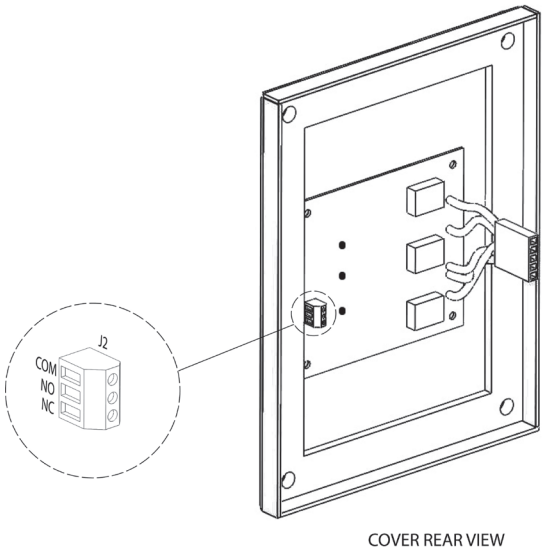


Figure 8
Terminal Block
Contacts shown in energized normal state (no fault condition).



Models: JSP60kA to JSP100kA with -M option and JSPR Series

For these models, the Form "C" contacts come pre-wired with 36" of #20AWG conductors.

See Figure 7 for the Form "C" wiring and contact configuration.

Use butt splices within the panelboard to connect the Form "C" leads to the user's monitoring circuits. Alternatively, install a junction box between the JSP Series and the panelboard to connect Form "C" leads to user's monitoring circuits. If the Form "C" contacts are not used, user has the option of either cutting off the leads or coiling up the leads and saving them for potential future use. Consult applicable local codes to ensure proper installation.

Models: JSP120kA to JSP400kA

For these models, the Form "C" contacts must be wired by the installer.

See Figure 8 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.

The installer must route the monitoring conductors to the terminal blocks on the door mounted main monitoring board. Route the wires to allow the door 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–#16AWG. #18–#20AWG is recommended.

Verification and Power Up

△ W A R N I N G ! It is recommended that the cover of the JSP Series unit along with its associated cabling be installed prior to applying power. The monitoring harness, which exits the epoxy and connects to the input connector on the monitor board, contains line voltage when power is applied to the unit.

Apply Power to the JSP Series unit by closing the overcurrent protection device or switch feeding the suppressor.

Figure 9
JSP Diagnostics

For Compact JSP units (60, 80, and 100kA)

Verify that all “Protection Available” indicating lights are illuminated. The “Protection Available” indicating lights extinguish only upon failure of one or more phases (indicating an alarm condition).

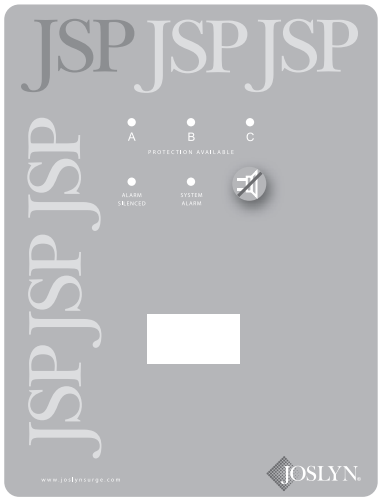
For Standard JSP units (120, 160, 200, 240, 300, and 400) or -M (60, 80 and 100kA) and JSPR Units

Verify that all “Protection Available” indicating lights are illuminated. The “Protection Available” lights extinguish 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 audible alarm.

△ CAUTION: Pressing the “ALARM SILENCE” button when the alarm has not triggered will prevent the audible alarm from sounding during a failure.

Figure 10
JSP with Counter Option Diagnostics



For JSP units with surge counter option (Not available on 60, 80 and 100kA or JSPR units)

The number of surges detected by the SPD is displayed on an eight digit LCD display on the front of the JSP door. The LCD counter is battery backed to maintain the number of surges even during a power loss. Press the reset button on the counter to reset the surge count.

Troubleshooting

Your JSP Series unit 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, service required indicating light is on, or Form "C" alarm contacts have changed state.	Verify that the input power feeding the JSP Series unit is energized using a voltage tester. If power is present, contact factory for assistance: 800.238.5000

Installation 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 800.238.5000 or 804.236.3300 joslyn@tnbpowersolutions.com

JSP Series units are warranted for a period of 10 years from date of purchase. In the event that any module or subassembly within the SPD fails to perform as specified during the warranty period, call our Technical Support at 800.238.5000.

Standards and Listings

The following standards and listings apply to the JSP Series product line:

- Listed by UL to UL 1449 3rd Edition (2009 Revision) for Type 1 and Type 2 SPD application, cUL, and UL 1283
- Meets Requirements for UL 96A
- Compliant to IEEE C62.41.1-2002, C62.41.2-2002 and C62.45-2002
- NFPA 70 [NEC], Article 285
- RoHS Compliant
- CE, IEC 61643-11-2011
- EMC Directive 2004/108/EC
- Low Voltage Directive 2006/95/EC

Return and Warranty Procedures

A Return Material Authorization (RMA) number must be obtained from T&B Customer Service department before replacement products can be shipped.

INFORMATION	EXAMPLE
Model Number	JSP(R)120277/4803GY
Serial Number	15478-0113-001
Date of Purchase	January 2, 2013
Description of Failure	"Service Required" indicating light illuminated
Desired Action from Joslyn	Replace

Warranty Statement

Thomas & Betts Power Solutions, LLC, A Member of the ABB Group ("Seller") warrants that your Joslyn surge protective device (the "Product"), shall meet applicable industry standards and specifications and be free from defects in materials and/or workmanship. Should any failure of the Product to conform to this warranty appear within the standard warranty period, Seller shall either repair or replace the defective Product, or part thereof, upon return to Seller's manufacturing facility in Richmond, Virginia with transportation charges prepaid. The applicable warranty period as outlined herein.

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

THIS WARRANTY REPRESENTS THE ENTIRE WARRANTY OF SELLER. 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 Seller under this warranty is expressly limited to the replacement or repair of the defective part thereof, at Seller's sole option.

IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND OR CHARACTER, NOR SHALL SELLER'S LIABILITY EVER EXCEED THE PURCHASE PRICE PAID FOR SUCH DEFECTIVE PRODUCT.

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

Warranty Period

JSP Series (AC) – (All)
10 Year
15 Year Optional

Notes

Model #

Date of Purchase

Date Installed

Installer

Thomas & Betts Power Solutions
5900 Eastport Blvd. • Richmond, VA 23231-4453 USA
Tel: (804) 236-3300 • Toll free: (800) 238-5000 • Fax: (804) 236-4841
tnbpowersolutions.com/joslynsurge

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