

PANEL-TYPE TRANSIENT VOLTAGE SURGE SUPPRESSORS INSTALLATION & OPERATING INSTRUCTIONS

DESCRIPTION

Knock-out mounted and cabinet type hard-wired Transient Voltage Surge Suppressors for use at main panel or sub-panel locations.

APPLICATION

Protects electronic equipment from damaging voltage transients. These high energy impulses are caused by electrical disturbances conducted through utility powerlines or internal sources such as adjacent equipment switching on the same branch circuit or service panel feed. These impulses can result in catastrophic damage to connected electronic equipment. More likely is less obvious damage in the form of information errors and erratic operation, which eventually lead to permanent damage.

Pass & Seymour's panel mount Transient Voltage Surge Suppressors, when installed at the main service entrance or sub-panel locations, will help limit transient voltage disturbances to a level tolerable to the connected equipment. Supplementary protection is also recommended in the form of receptacle or portable cord connect/direct plug-in devices and can be provided by Pass & Seymour. Please contact Pass & Seymour for additional device or Catalog Number information.

STANDARDS

Light duty units are UL1449 and OWHX Listed (1224-SL). Medium duty units are UL1449 and CUL Listed (1224-SM, 1220-TWM, 2748-TWM, 240-TDM). Heavy duty units are UL1449, UL1283, CUL and CSA Listed (1224-SH, 1220-TWH, 2748-TWH, 240-TDH, 480-TDH).

LIMITED FIVE YEAR WARRANTY

Pass & Seymour will remedy any defect in workmanship or material in Pass & Seymour products which may develop under proper and normal use within five (5) years from date of purchase by a consumer:

(1) by repair or replacement, or, at Pass & Seymour's option, (2) by return of an amount equal to consumer's purchase price. Such remedy is IN LIEU OF ANY AND ALL EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Such remedy by Pass & Seymour does not include or cover cost of labor for removal or reinstallation of the product. ALL OTHER FURTHER ELEMENTS OF DAMAGE (INCIDENTAL OR CONSEQUENTIAL DAMAGES) FOR BREACH OF ANY AND ALL EXPRESSED OR IMPLIED WARRANTIES INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXCLUDED HEREBY. (Some states do not allow disclaimer or exclusion or limitation of incidental or consequential damages, so the above disclaimers and limitation or exclusion may not apply to you.) ANY IMPLIED WARRANTIES INCLUDING WHERE REQUIRED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED TO THE FIVE YEAR PERIOD SET FORTH ABOVE. (Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.)

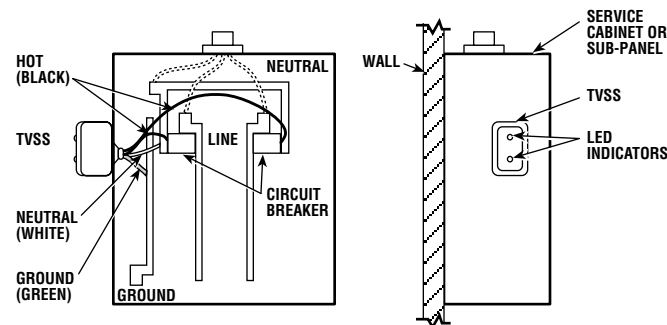
To insure safety, all repair to Pass & Seymour products must be made by Pass & Seymour, or under its specific direction. Procedure to obtain performance of any warranty obligation is as follows: (1) Contact Pass & Seymour, Syracuse, New York 13221, for instructions concerning return or repair, (2) return the product to Pass & Seymour, postage paid, with your name and address and a written description of the installation or use of the Pass & Seymour product, and the observed defects or failure to operate, or other claimed basis for dissatisfaction.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

ALL DEVICES SHOULD BE INSTALLED BY A LICENSED ELECTRICIAN. ALL WIRING MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND ANY APPLICABLE LOCAL CODES.

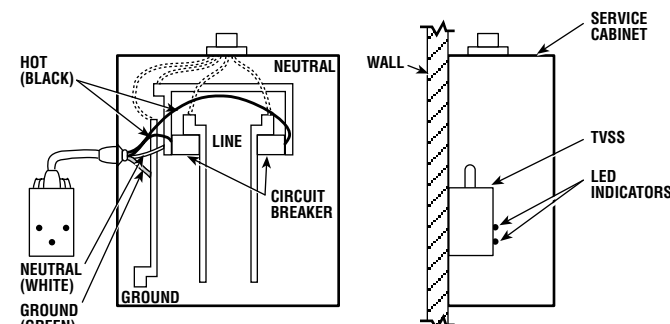
CATALOG NUMBER 1224-SL

1. Insure that all power is removed before beginning installation.
2. Mount the surge suppressor through a knockout on the service panel. The unit should be positioned for a minimum of wire length between itself and the input power terminals of the service panel. Remove nut from threaded nipple of surge suppressor, place nipple through knockout and reapply nut.
3. Connect black wires to line buss bars through a circuit breaker rated 30 amperes or less, capable of delivering not more than 42,000 amperes of RMS symmetrical current. Circuit breakers should be located as close as possible to the input power terminals of the service panel.
4. Connect the white wire to the neutral bar and the green wire to the ground bar. Keep wires as short as possible. Avoid bending the wires at sharp angles.
5. Apply power. The surge suppressor is protecting when the two green lights are illuminated. If green lights do not come on, remove power and check all connections to the unit. If lights still do not come on, contact Pass & Seymour/Legrand at 800-223-4185.
6. Periodically monitor the status of the green lights. Loss of protection is indicated by a green light (or lights) turning off. There are no user serviceable parts, contact Pass & Seymour/Legrand for replacement.



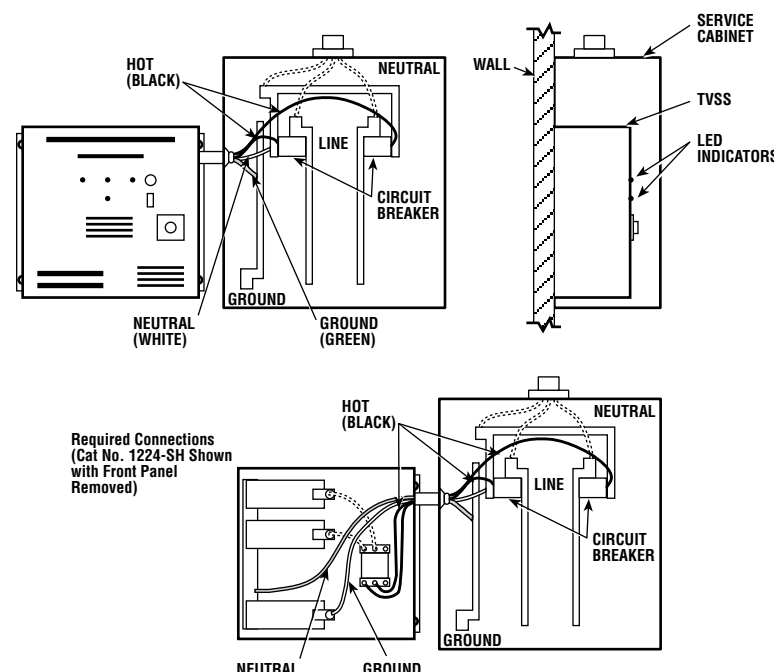
CATALOG NUMBERS 1224-SM, 1220-TWM, 2748-TWM, 240-TDM

1. Insure that all power is removed before beginning installation.
2. Mount the surge suppressor as close as possible to the service panel. The unit should be positioned for a minimum of wire length between itself and the input power terminals of the service panel.
3. Remove the fitting from the conduit provided and cut the conduit so that it will fit between the TVSS and the knockout selected on the service panel. Feed all wires through the conduit into the panel and tighten all fittings.
4. Connect black wires to the line 1 and 2 or phase A, B, and C buss bars through circuit breakers rated 20 amperes or less, capable of delivering not more than 65,000 amperes of RMS symmetrical current. Circuit breakers should be located as close as possible to the input power terminals of the service panel. For Catalog Number 240-TDM, insure that the black wire marked "Phase B" is connected to the high leg, failure to do so will result in damage to the surge suppressor.
5. Connect the white wire to the neutral bar and the green wire to the ground bar. Keep wires as short as possible. Avoid bending the wires at sharp angles.
6. If not using remote supervisor circuit (RSKIT), cut and dress the blue, orange, and yellow wires into the conduit. If utilizing the RSKIT, see the directions for connection under Catalog Number RSKIT.
7. Apply power. The surge suppressor is protecting when the green lights are illuminated and the red light is off. If green lights do not come on, remove power and check all connections to the unit. If lights still do not come on, contact Pass & Seymour/Legrand at 800-223-4185.
8. Periodically monitor the status of the green and red indicators. Loss of protection is indicated if a green light or lights turn off, or if the red light turns on. Loss of protection is also indicated by activation of an audio alarm. There are no user serviceable parts, contact Pass & Seymour/Legrand for replacement.



CATALOG NUMBERS 1224-SH, 1220-TWH, 2748-TWH, 240-TDH, 480-TDH

1. Insure that all power is removed before beginning installation.
2. Install the side mounting flanges to the holes provided in the side of the surge suppressor (hardware included), so that the mounting holes are against the wall.
3. Determine where the surge suppressor is to be mounted, allowing for minimum lengths of wire between itself and the input power terminals of the service panel. Punch or cut proper size hole in the side of the surge suppressor closest to the knockout to be utilized in the service panel. Mount surge suppressor and connect to service panel via conduit.
4. Connect black wires (line or phase) to the screw terminals connections of the rotary disconnect switch through circuit breakers capable of delivering not more than 200,000 amperes of RMS symmetrical current. Circuit breakers should be located as close as possible to the input power terminals of the service panel. Run 1/0-14 AWG wire from the service panel through the conduit into the surge suppressor. It is recommended that green colored wire be used for ground, white colored wire for neutral, and black colored wires for line or phase connections.
5. Connect black wires (line or phase) to the screw terminal connections of the rotary disconnect switch. Connections should be made to the terminals opposite those with wires connected to the line or phase modules. Connect the green (ground) wire to the screw terminal marked "Transient Ground." Connect the white (neutral) wire to the screw terminal marked "N." Keep all wires as short as possible. Avoid bending the wires at sharp angles. To obtain the UL1449 surge voltage rating marked on the device, wiring must enter the device as shown in the accompanying diagram. Utilizing any other wiring location will yield different suppression levels.
6. If utilizing the remote supervisor circuit RSKIT, see the directions under Catalog Number RSKIT.
7. Apply power. The surge suppressor is protecting when the green lights are illuminated and the red light is off. If the green lights do not come on, check to make sure the rotary disconnect switch on the front panel is in the "on" position. If it is, remove power to the surge suppressor and the service panel and check all connections. If lights still do not come on, contact Pass & Seymour/Legrand at 800-223-4185.
8. Set the front panel alarm enable/disable switch to the desired location.
9. Periodically monitor the status of the green and red indicators. Loss of protection is indicated if a green light or lights turn off and the red light turns on. Loss of protection is also indicated by an audio alarm if the front panel switch is set to the enable position.
10. The protection modules in these units are replaceable, contact Pass & Seymour/Legrand for replacement numbers.



CATALOG NUMBER MFKIT

NOTE: This catalog number is for use only with Pass & Seymour/Legrand Catalog Numbers 1224-SM, 1220-TWM, 2748-TWM, and 240-TDM. It should be used when flush mounting of these catalog numbers is desired.

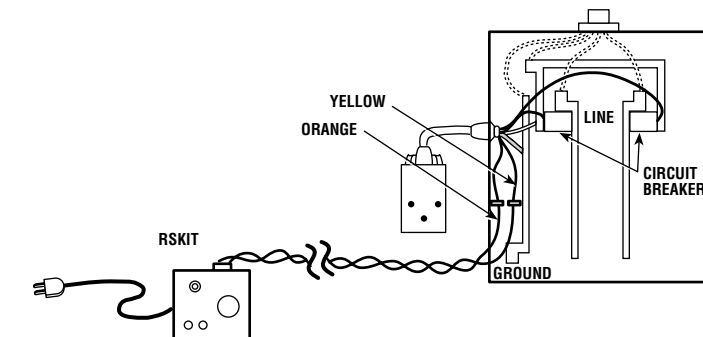
1. After determining where the surge suppressor is to be mounted, mount the surge suppressor (mounting hardware not included) such that it will protrude from the flush mount wall from 1/8" to 3/8".
2. Cut a hole in the flush mount wall. Rough opening should be 4.5" wide by 8.0" high, and the hole should be placed so that the surge suppressor is at the bottom of this opening (insures access to conduit fitting).
3. Place flush trim over unit and secure to wall (mounting hardware not included).

CATALOG NUMBER RSKIT

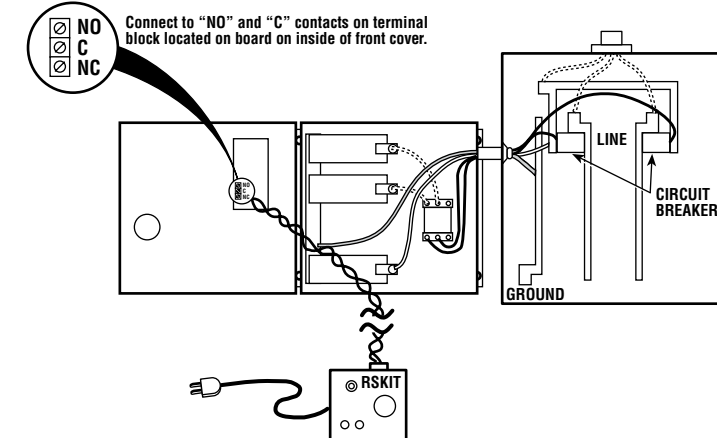
NOTE: This device can be used with all M and H suffix devices.

1. Insure that all power is removed before beginning installation.
2. Locate RSKIT in convenient location, up to a maximum of 500 feet from the surge suppressor to be monitored.
3. Connect wires to RCA type male connector (not supplied). Allowable wire gauge is 12-26 AWG. Plug connector into jack marked "Fault Input."
4. Run wires to surge suppressor. Wires can be twisted during length of run between RSKIT and surge suppressor.
5. For M suffix devices, connect to yellow and orange wires. For H suffix devices, connect wires to terminal block on inside of unit, marked "NO" and "C." Wires may be brought in through conduit used to connect unit to service panel or through their own punched or cut hole.
6. Apply power to surge suppressor and RSKIT, which may be plugged into any 120VAC receptacle. Device is operational if green indicator is lit. H suffix units may be tested by pressing the test switch on the surge suppressor, this will cause the red indicator to light, the green indicator to go off, and the alarm to energize if alarm disable switch is set to enable.
7. Recommended wire size for relay terminal block is 18 AWG. 14-22 AWG may be used.
TORQUE: GREEN Terminal blocks: 3.5 in/lbs.
GRAY Terminal blocks: 4.5 in/lbs.

M SUFFIX DEVICES



H SUFFIX DEVICES



Pass & Seymour



| Catalog Number | Nominal Voltage | System Application | Max Surge Capability | Available Interrupt Current | UL 1449 Suppressed Voltage Ratings (Vpk) | | | | Visual Indicators | | Audio Alarm | Alarm Disable Switch | Test Switch | Form C Contact | EMI/RFI Filtering | Rotary Disconnect | Connection Means | | Transformer Configurations | | |
|----------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------|-----------------------------|------------------------------------------|----------------|--------------|-------------------|-------------------|-------|-------------|----------------------|-------------|----------------|-------------------|-------------------|------------------|----------------|----------------------------|----------|--|
| | | | | | Line to Neutral | Line to Ground | Line to Line | Neutral to Ground | Red | Green | | | | | | | Type | Gauge | | | |
| 1224-SL | 120VAC | Single Phase, 3W plus Ground | 40KA | 42kAIC | 400 | N/A | 700 | N/A | 0 | 2 | | | | | | | Wire | 10 | | | |
| 1224-SM | | | 100KA | 65kAIC | 400 | 800 | 800 | 400 | 1 | 2 | X | | | X | X | | Wire | 12 | | | |
| 1224-SH | | | 200KA | 200kAIC | 400 | 400 | 700 | 400 | 400 | 1 | 1 | X | X | X | X | X | X | Screw Terminal | | 1/0 – 14 | |
| 1220-TWM | 120/208VAC | Three Phase, Wye, 4W plus Ground | 100KA | 65kAIC | 400 | 800 | 800 | 400 | 1 | 3 | X | | | X | X | | Wire | 12 | | | |
| 1220-TWH | | | 200KA | 200kAIC | 400 | 400 | 700 | 400 | 400 | 1 | 1 | X | X | X | X | X | X | Screw Terminal | | 1/0 – 14 | |
| 2748-TWM | 277/480VAC | Three Phase, Wye, 4W plus Ground | 100KA | 65kAIC | 800 | 1500 | 1500 | 800 | 1 | 3 | X | | | X | X | | Wire | 12 | | | |
| 2748-TWH | | | 200KA | 200kAIC | 700 | 700 | 1500 | 700 | 700 | 1 | 1 | X | X | X | X | X | X | Screw Terminal | | 1/0 – 14 | |
| 480-TDH | 480VAC | Three Phase, Delta, 3W plus Ground | 200KA | 200kAIC | N/A | 1500 | 1500 | N/A | 1 | 1 | X | X | X | X | X | X | Screw Terminal | 1/0 – 14 | | | |
| 240-TDM | 120/240VAC | Three Phase, Delta, High Leg, 4W plus Ground | 100KA | 65kAIC | A-N,C-N: 400 B-N: 800 | | | | 1 | 3 | X | | | | | | X | X | Wire | 12 | |
| | | A-G,C-G: 800 B-G: 1500 | | | | | | | | | | | | | | | | | | | |
| | | N-G: 400 A-B: 1500 | | | | | | | | | | | | | | | | | | | |
| | | A-C: 800 B-C: 1500 | | | | | | | | | | | | | | | | | | | |
| RSKIT | Operates from 120VAC. Interfaces with any of the above surge suppressors available with the "Form C Contact" option. | | | | | | | | | | | | | | | | | | | | |
| MFKIT | Allows for flush mounting of Catalog Numbers 1224-SM, 1220-TWM, 2748-TWM, 240-TDM. | | | | | | | | | | | | | | | | | | | | |

Nominal Voltage – this is the nominal line to neutral or line to line voltage that the surge suppressor is intended to be connected to. Failure to match surge suppressors to nominal system source voltages can permanently damage the device or provide inadequate surge suppression.

System Application – the electrical transformer source configuration the surge suppressor was designed to be connected to.

Maximum Surge Capability – the maximum surge current the device can withstand non-repetitively without a change in measured limiting (clamping) voltage of more than plus or minus 10%. This number is also a reflection of the number of lower current pulses the device can withstand without a change in measured limiting voltage. The higher this number is the more lower current transients the device can withstand.

Available Interrupt Current (AIC) – the highest current at rated voltage that a device is intended to interrupt under standard test conditions. (NEMA Surge Protection Institute)

UL1449 Suppressed Voltage Rating – Underwriters Laboratories Standard 1449, "Transient Voltage Surge Suppressors," contains a section that mandates the measurement of let-through (clamping) voltage under a certain repeatable transient condition, for each mode in which surge suppression is claimed. This allows for comparison among various manufacturers of let-through voltage in a way that is meaningful to the end user.

Visual Indicators – provides a method for determining the status of the surge suppression components. When all surge suppression components are operational, the green lights will be lit and the red light (if provided) will be off. Loss of surge suppression in any mode will cause a green light or lights to go out and the red light to come on. Periodic monitoring of these status indicators is necessary to insure prompt replacement of surge suppression in case of failure.

Audio Alarm – provides supplementary indication of failed surge suppression components. The alarm will sound whenever surge protection is lost.

Alarm Disable Switch – this switch has two positions. The "enable" position allows the alarm to sound upon loss of surge protection. The "disable" position turns the alarm off if protection has been lost, or inhibits the alarm from sounding if this position has been selected prior to failure of surge suppression components.

Test Switch – allows for operational testing of the red indicator light and the audio alarm. Pressing this switch will turn the red light on and energize the audio alarm if alarm disable switch is set to enable.

Form C Contact – provides a normally open, normally closed, and common set of contacts for use with RSKIT, or for other user defined functions. The relay that controls these contacts is energized when all surge suppression components are functional. It will deenergize upon loss of protection.

EMI/RFI Filtering – provides for a degree of protection against conducted radio frequency and electromagnetic noise present on electrical power distribution wiring. Attenuation levels up to 40db are possible between frequencies of 100KHz and 30MHz.

Rotary Disconnect – allows for removal of electrical power in the event that servicing is required.

Connection Means – required type of electrical connection to the surge suppressor. If the connection requirement is for screw terminal, the allowable wire gauges are shown.

Transformer Configurations – pictorial representation of the transformer configuration the surge suppressor is intended to be connected to.