ALLTEC

DynaShield®

Surge Protection Devices

ADSx(2F) Series

User Manual and Installation Instruction Guide
Surge Protection Device for AC Power Applications

The ADSx Series of AC Surge Protection Devices are ANSI/UL 1449 -3rd Edition defined as Type 1/2 protective devices. Type 1 SPDs are suitable for direct installation on the supply line of the service disconnect. Type 2 SPDs are installed on the load side of the service disconnect and may be ordered with UL1283 Listed EMI/RFI filter.

The SPDs are parallel mounted transient surge suppression devices intended to be installed either at an AC Main Service, Distribution Panel or a critical load. They may also be mounted directly within equipment enclosures such as SCADA Control Panel Systems.

The SPD should be part of a coordinated surge suppression system that includes primary protection at the main service entrance, secondary protection at distribution panels, and at point of use for sensitive electronic equipment. Proper system design should also include protecting all other copper data lines or control signals that leave or enter the equipment site building.

DANGER!

ONLY QUALIFIED PERSONNEL SHOULD INSTALL OR SERVICE THIS SYSTEM. ELECTRICAL SAFETY PRECAUTIONS MUST BE FOLLOWED WHEN INSTALLING OR SERVICING THIS EQUIPMENT. TO PREVENT RISK OF ELECTRICAL SHOCK, TURN OFF AND LOCK OUT ALL POWER SOURCES TO THE UNIT BEFORE MAKING ELECTRICAL CONNECTIONS OR SERVICING.

DANGER!

SEULEMENT LE PERSONNEL QULIFIE DOIT INSTALLER OU MAINTENIR CE SYSTEME. DES PRECAUTIONS DE SECURITE EN ELECTRICITE DOIVENT ETRE SUIVIS LORS DE L'INSTALLATION OU DE LA MAINTENANCE DE CET EQUIPMENT. POUR EVITER TOUL RISQUE DE CHOC ELECTRIQUE, DEBRANCHEZ ET VEROUILLER TOUTES LES SOURCES D'ALIMENTATION DE CET EQUIPMENT AVANT DE LE BRANCHER OU LE MAINTENIR.

DANGER!

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Thoroughly read and comprehend all instructions before commencing installation.

This equipment must be installed by qualified electrical personnel in accordance with all applicable codes which supersede these instructions.

Improper installation or misapplication of these devices may result in death or serious injury.

Failure to follow these instructions could result in damage to the electrical system or related equipment.

Apply appropriate Personal Protective Equipment and follow safe electrical work practices. See NFPA 70E.

Never install this unit if it has fallen, has been dropped or appears damaged in any way. Return device to factory for diagnostic testing.

CAUTION!

HAZARD OF EQUIPMENT DAMAGE

This device is suitable for use on a circuit capable of delivering NOT more than 200K RMS Symmetrical Amperes, AC Service Volts Maximum.

Unit contains no serviceable parts.

Do NOT attempt to test this device, damage may occur. Any alterations, tampering, misuse or unauthorized repairs of this product will void its original factory warranty.

Never install on an ungrounded system.

All international, national, and local electrical codes should be followed during installation. Electrical installation should only be performed by qualified personnel that are certified to service and install this equipment. To prevent risk of Electrical Shock, turn off and lock out all power sources to the unit before making electrical connections or servicing.

General Safety

This document provides detailed information on how to install and operate the ADSx Series of Surge Protection Devices (SPDs).

IMPORTANT

INSTALLATION OF THIS DEVICE SHOULD ONLY BE PERFORMED BY A LICENSED ELECTRICIAN.

Incorrect installation may significantly impair the performance of this Surge Protection Device. All installation procedures and guidelines MUST be followed exactly.

Before starting any installation procedures:

1. Verify service voltage configuration with an AC voltmeter to ensure that the correct SPD model has been selected.
2. Verify Earth Ground resistance is less than 25 ohms.
3. Secure all power from the panel to which the devices is being installed. Failure to do so could result in damage to the suppressor and poses a potential electrical shock hazard to personnel.
4. Ensure all connections are correct per the layout installation diagram (See Fig. 4) and secure before energizing SPD.

UNPACKING

Unpack the surge suppressor from its shipping container and visually inspect for shipping related damage. If unit(s) are received damaged, notify the shipping company immediately. Retain all shipping containers and packing materials for inspection.

LOCATION CONSIDERATIONS

Select a location as close as possible to the AC power source and securely mount it to any surface. Route conduit from the AC power source to the suppressor assembly. The unit is designed for indoor and outdoor installations in ambient temperatures of -40°C (-40°F) to +60°C (140°F) with a relative humidity of 0% to 95% (non-condensing). It is encouraged to avoid direct sun loading.

OVERCURRENT PROTECTION

For ease of maintenance, it is recommended that the SPD be connected to the service panel using a multi-pole 20 A or 30 A circuit breaker.

MOUNTING

The SPD uses a NEMA 4X enclosure, suitable for use in indoor or outdoor installations. Locate the SPD on the wall next to the service panel. Locate the available disconnect means and remove the closest knockout. If the SPD shall be connected to the knockout via conduit, plan the route to minimize bends and wire lengths. The conduit needs to match the Type rating of the enclosure (Type 4X), unless installed in dry indoor location. Refer to the dimensional information for mounting hole dimensions, clearances and weight. Mount SPD to wall using 3/8” mounting hardware.

Units

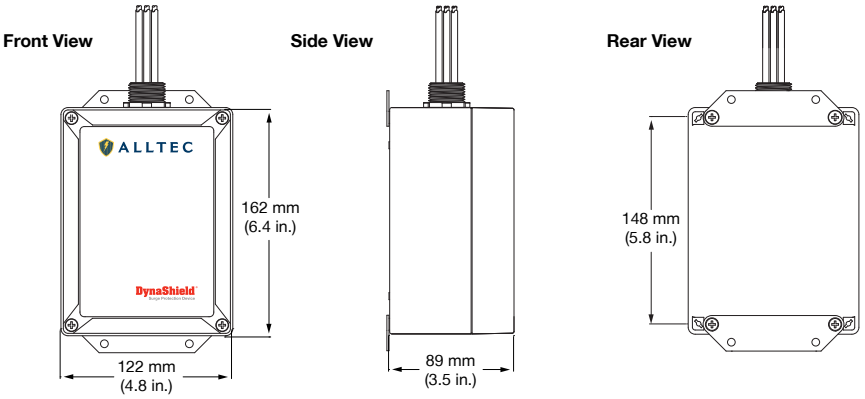


Figure 1. Dimensional Drawing [ADSx050(2F) & ADSx100(2F) Models]

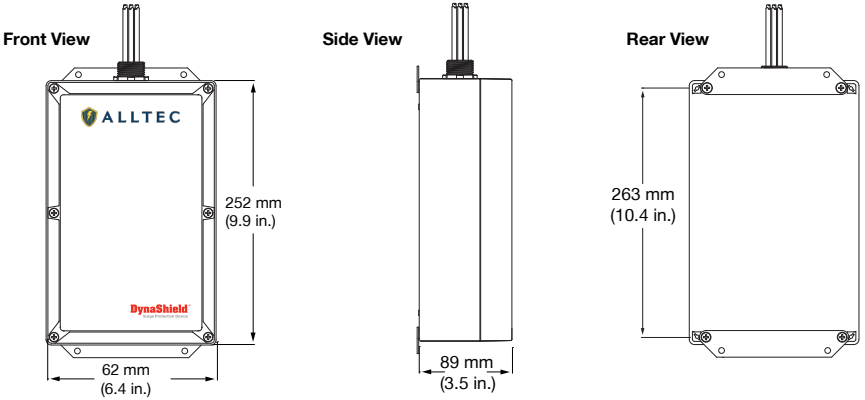
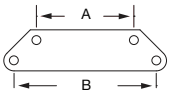


Figure 2. Dimensional Drawing [ADSx200(2F) & ADSx300(2F) Models]

MOUNTING BRACKETS

ADSx models are supplied with two mounting brakets with mounting holes. Attach mouting brackets to rear of unit as required by installation location.



For ADSx050 & ADSx100 Models
A: 60.3 mm (2.4 in.)
B: 89 mm (3.5 in.)

For ADSx200 & ADSx300 Models
A: 100 mm (3.9 in.)
B: 130 mm (5.1 in.)

Figure 3. Mounting Brackets

Mounting Instructions

Optimize device performance by keeping connecting wires as short and straight as possible.

1. Plan the wiring path(s) prior to commencing the installation procedure.
2. Locate the SPD as close to the available disconnecting means to minimize the length of the connecting wires.
3. Securely mount the SPD unit using the four (4) mounting holes provided in the enclosure's mounting flanges.

The ADSx Series products are installed and connected in parallel "shunt" across the AC supply to be protected. Connecting wires do not carry the supply current. They only conduct the short duration current associated with the suppression of transient surge events.

Installation Instructions

Before starting the installation, measure the Line voltage with an AC voltmeter to ensure the correct device has been selected for the current application. The MCOV (maximum continuous operating voltage) must not exceed the maximum limits for the following service voltages:

120 Vac = 180 MCOV	277 Vac = 320 MCOV
127 Vac = 180 MCOV	480 Vac = 550 MCOV
220 Vac = 320 MCOV	600 Vac = 690 MCOV
240 Vac = 320 MCOV	

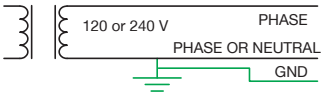
STANDARD ELECTRICAL CONFIGURATIONS

1Ø	2Ø Split	3Ø Wye	3Ø Delta
120 Vac	120/240 Vac	120/208 Vac	-
-	-	127/220 Vac	-
-	-	220/380 Vac	-
240 Vac	-	240/415 Vac	240 Vac
-	-	277/480 Vac	480 Vac
-	-	347/600 Vac	600 Vac

ELECTRICAL CONNECTIONS

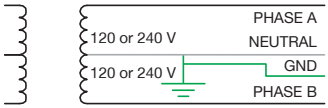
Ensure that all power is removed before beginning installation. Verify that the voltage rating is appropriate for connection to the intended power source. Connect the green/yellow Ground wire and the white neutral wire. Then connect the black (phase A), Red (phase B), and Blue (phase C) wires, keeping all conductors as short and straight as possible, ideally less than 18 inches. The grounding conductor should be the same size as the associated power conductors. Grounding and power conductors should be routed in the same conduit. If metallic conduit is used, adequate electrical continuity must be maintained at all connections, including electrical enclosures.

Single Phase, 2 Wire + Ground (120 or 240 V)



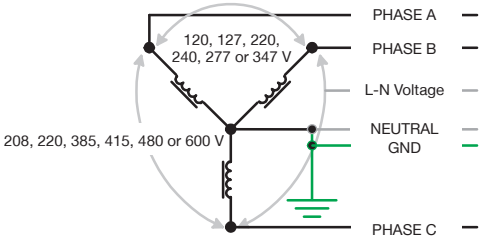
Requires a 1 Pole Breaker

Split Phase, 3 Wire + Ground (120/240 V)



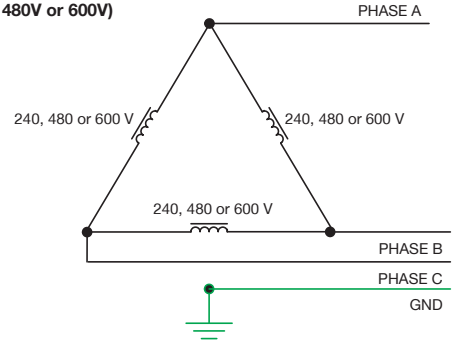
Requires a 2 Pole Breaker

Three Phase Wye, 4 Wire + Ground
(120/208 V, 127/220 V, 220/385 V, 240/415 V, 277/480 V or 347/600V)



Requires a 3 Pole Breaker

Three Phase Delta, 3 Wire + Ground
(240V, 480V or 600V)



Requires a 3 Pole Breaker

Figure 4. Electrical Connections

SYSTEM GROUNDING AND BONDING

For proper SPD performance, the service entrance grounding electrode system must comply with the NEC (National Electric Code) by having all available electrodes properly bonded together and connected to the power system grounding (building steel, driven rods, concrete encased electrode). For optimum SPD performance, an earth ground resistance of < 5 Ohms is recommended. See NEC table 250-122 for the appropriate grounding conductor size.

ALARM CONTACTS

If desired, connect the SPD summary alarm contacts.

1. Loosen screws on front of unit, remove cover and turn over.
2. Locate the terminal connections and connect using #18 - #22 AWG wires. Route wires out thru pipe nipple.
3. Close cover taking care not to pinch any wires or ribbon cable.
4. Tighten screws.

Wiring for the Alarm Contacts must meet or exceed the rating of the wiring provided for the mains.

OPTIONAL INSTALLATION:

1. It is possible for an end-user to add their own nipple to the bottom of the enclosure, so the Alarm Contact wiring can be brought straight out.
2. The nipple needs to match the Type rating of the enclosure (either Type 4 or 4X), unless installed in dry indoor location.
3. The alarm contact wiring ratings need to be suitable for the voltage and current available at the alarm contacts.

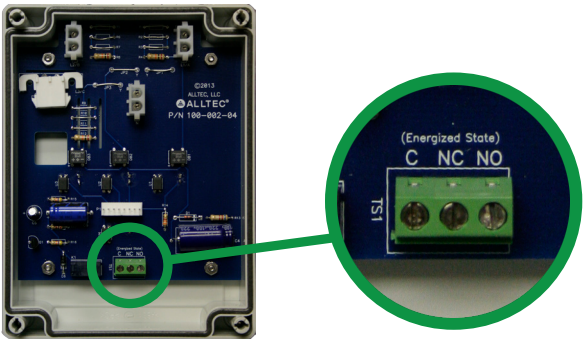


Figure 5. Alarm Contact Connections

Wiring Instructions

1. Connect the Green/Yellow Ground wire to the system ground bus.
2. Connect the White Neutral wire to the neutral bus.
3. Connect the Black (phase A), Red (phase B), and Blue (phase C) wires to each phase.
4. Apply external AC power to the SPD, check that Blue LEDs are illuminated per the diagrams below.

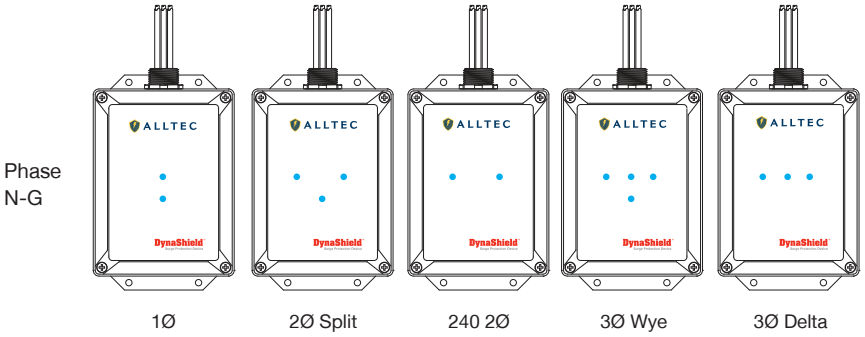


Figure 6. Normal Operating Condition

NOTE:
BEFORE ENERGIZING THE SPD: ENSURE ALL CONNECTIONS ARE CORRECT.

STATUS INDICATORS - PHASE LED INDICATOR(S)

When the SPD is securely connected and operating properly, the Blue Phase LEDs will be illuminated. Replacement of the SPD is required if any Blue phase LED is not illuminated.

Apply power. The SPD is fully operational when the BLUE LED on the front panel are illuminated. If the Blue LED are extinguished, check to ensure power is applied. If the alarm contacts indicate an abnormal condition exists, remove power and contact ALLTEC customer service at 1-800-203-2658 or www.alltecglobal.com.

ADSx Model part numbering system

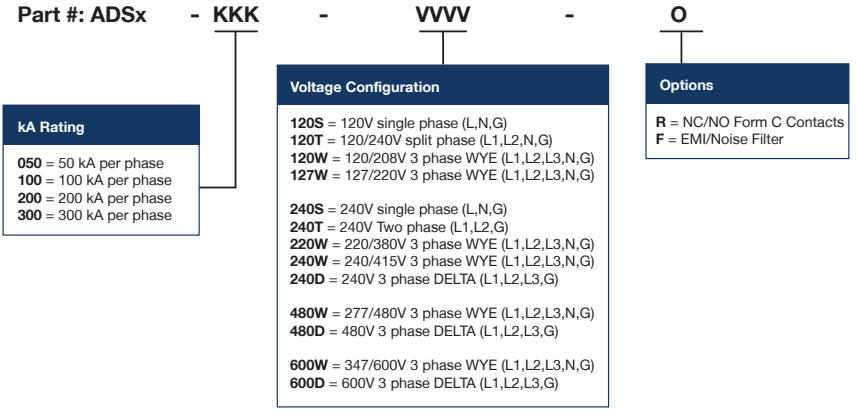


Figure 7. Part Numbering System

DESCRIPTIONS

ADSx(2F*)T-KKK-VVVV-EL
ADSx = Model Name
K = kA Rating
V = Voltage Configuration
O = Options
* Delta Configurations do not come with a filter, so the '2F is dropped from the part number

kA Rating (Surge Capacity)
3 numeric charactors define the kA rating per phase.

Voltage Configuration
3 numeric & 1 alpha character defines the SPD phase type.

Options
Alpha character (R) defines options.

Examples
ADSx2F-050-120T-F: Type 2, Filter, 50kA, 120/240 Vac Two Phase Split
ADSx2F-100-127W: Type 2, No Filter, 100kA, 127/220 Vac Three Phase Wye
ADSx2F-200-220W-F: Type 2, Filter, 200kA, 230/400 Vac Three Phase Wye
ADSx-200-240D-R: Type 2, 200kA, 240 Vac Three Phase Delta, NC/NO Form C Contacts
ADSx-300-480D: Type 2, 300kA, 480 Vac Three Phase Delta

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