



**SIEMENS**

*Ingenuity for life*

Selection and Application Guide

## Residential Surge Products

Protect your home from costly power surges

### Did you know...

Lightning-related incidents account for more than \$1 billion in insurance claims annually? Protect your home from lightning (and utility) related surges with Siemens' complete line of surge protection products. Whether you are building a new home, or want to protect your current home, Siemens offers at-the-source protection for all of your valuable appliances and electronics.

[usa.siemens.com/surge](http://usa.siemens.com/surge)



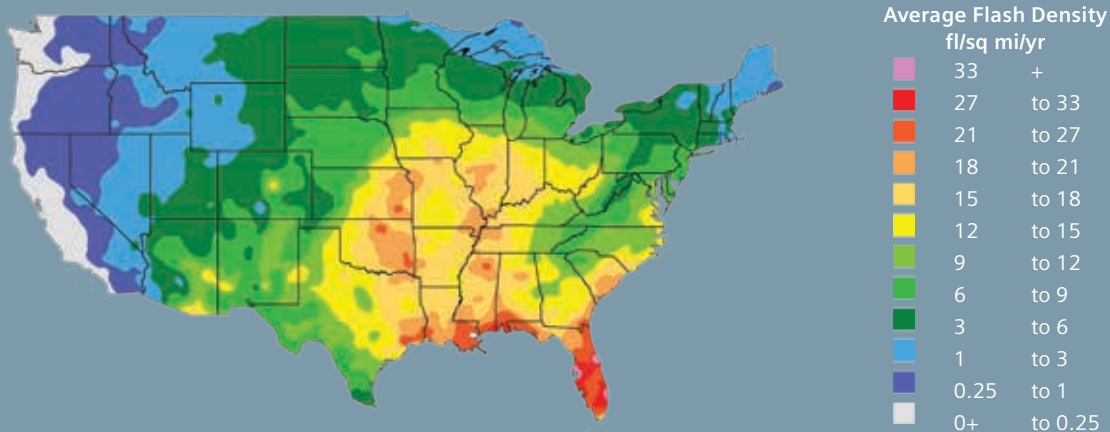


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# Vaisala National Lightning Detection Network® (NLDN®)

## Cloud-to-Ground Lightning Incidence in the Continental U.S. (1997-2011)



## What is surge?

- Electrical surges are sudden and unexpected spikes in voltage that travel throughout your home/office electrical systems.
- Some surges come from within your own home/office, such as turning on a vacuum cleaner or sending a document to your printer. Other surges come from outside your home, as in electric utility switching, downed power poles, cut power lines, and lightning strikes. Surge can even enter through cable televisions and telephone wiring.

### Why do you need surge protection?

- A five-year survey of power quality in North America indicates that per house hold there are 35 disruptive or destructive power disturbances per year.
- Deregulation of the electric utility industry is expected to decrease the quality of utility power in the near future.
- Annually, 30% of power outages are lightning related.
- Five percent of all insurance claims are lightning related, amounting to over \$1 billion per year.

- These electrical disturbances can ruin or severely damage motor driven appliances, electronics, disrupt satellite signals, degrade the performance of sensitive audio/ video components, and wreak havoc with telecommunication systems.

***It's far less expensive to invest in protection than it is to replace costly appliances.***

### How to protect your home?

The first line of defense is the point of entry where electricity enters a home through the main electrical service panel, where surges and voltage spikes from lightning strikes enter the electrical system.

Point of entry protection devices, or surge arresters, drive surges to ground before they can enter the premises providing whole house protection!

In addition to the vital point of entry protection, point of use devices provide enhanced protection for electronic devices by having a much lower limiting voltage.

### Tiered protection plan:

- Protecting with the surge arresters at the point of entry
- Enhanced protection on electronic equipment at the point of use



# Product Introduction



**Siemens' FirstSurge** - a whole line of 120/240V single phase hard-wired surge products designed to protect the entire electrical system of a home. FirstSurge offers protection levels at 60kA (FirstSurge Power), 100kA (First Surge Plus), and 140kA (FirstSurge Pro). These three devices replace part # SPD4HOME, rated only at 40kA. In addition FirstSurge offers fully-equipped load center options (P3054B1200S140, P4060B1200S140, S3054B1200S060, S4060B1200S060), as well as the more localized solutions of phone and cable television surge protection. Collectively, the FirstSurge family offers a wider range of options and higher ratings than other available solutions today. The devices can be purchased in retail (clamshell) packaging or in traditional wholesale packaging. Technical specifications can be found within.



# FirstSurge™

## Total Home Surge Protection



### Total Home Protection

Siemens believes today's residential surge protectors come up short when protecting today's modern home filled with smart appliances and electronics.

This is why we developed our FirstSurge™ commercial class total home surge protectors. These electrical system surge protectors are sized for where you live. They will let you know when there is something wrong or when they are worn out.

Based upon thunderstorm frequency, geographic location, and home size, we developed a surge exposure map correlating with FirstSurge™ current capacities known to provide years of protective service for each shaded area.

### Sized For Where You Live

Model	Surge Capacity
FirstSurge™ Power (FS060)	60,000 A
FirstSurge™ Plus (FS100)	100,000 A
FirstSurge™ Pro (FS140)	140,000 A



### Know You're Protected: 3 Stage Commerical Grade Notification

When there is a problem, Siemens FirstSurge™ takes the guesswork out of knowing when it is time to be replaced. What will you see and hear when this occurs?

- Audible Alarm: Beeps
- Green LED(s): Extinguish
- Red Service Light: Flashes

### Ground Reference Monitoring (GRM)

FirstSurge™ is GRM-equipped notifying you a rare safety hazard exists due to a compromised electrical system neutral to ground bond. What will you see and hear when this occurs?

- Audible Alarm: Beeps
- Green LED(s): Remains Lit
- Red Service Light: Flashes



# FirstSurge™

## Total Home Surge Protection

### Features & Benefits

- UL 1449 Listed, Type 2, Surge Protective Device (SPD)
- Rated for 120/240 split phase panels up to 400A
- Surge Current Capacities:
  - 60,000 A
  - 100,000 A
  - 140,000 A
- 3-stage Commercial Grade Notification
- Ground Reference Monitoring (GRM)
- Installs onto any brand load center
- Type 4 rated outdoor enclosure
- 10 year product and connected equipment warranty\*

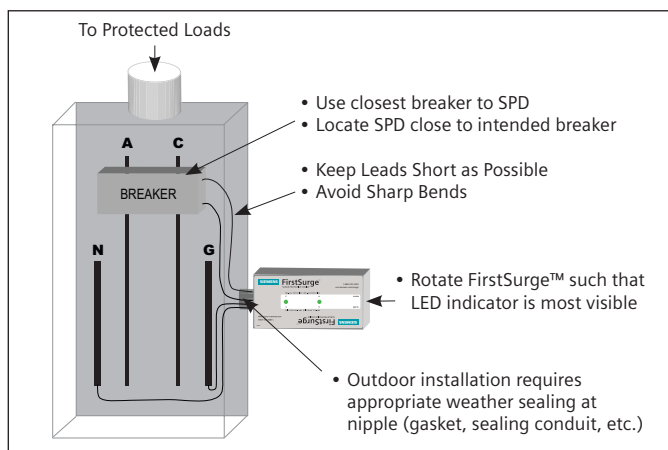
\*See warranty for details

### Installation Instructions:

FirstSurge™ is a Type 2 SPD. It is suitable for use downstream of the service disconnect.

Pre-plan your installation. You need to accomplish the following:

- Meet all National and Local codes (NEC® Article 285 and UL1449 address SPDs).
- Confirm System voltage to SPD voltage (120V SPD will fail instantly on 240V, 277V, etc.).
- Mount SPD as close to panel or equipment as possible to keep leads short. (long leads hurt performance).
- Ensure leads are as short and straight as possible, including neutral and ground. Use a breaker position that is close to the SPD and the panel's neutral and ground.
- Recommended breaker size is 20A.
- Make sure system is grounded per NEC® and clear of faults before energizing SPD. (inadvertent system problem may fail SPD).
- Never Hi-Pot test Any SPD. (will prematurely fail SPD).



Technical Specifications		
Surge Spike Capacity	FirstSurge™ Power (FS060)	60,000 A
	FirstSurge™ Plus (FS100)	100,000 A
	FirstSurge™ Pro (FS140)	140,000 A
Line Voltage	120/240 Split Phase, 50/60 Hz	
UL 1449 3rd Ed VPR	L-N: 600 V L-G: 600 V N-G: 600 V L-L: 900 V	
Rated Voltage (MCOV)	150V – L-N, L-G, and N-G; 300V – L-L	
SCCR	100kA	
Response Time	<1 nanosecond	
Enclosure	NEMA 4X Indoor and Outdoor Rated	
Selection Information		
FirstSurge™ Power	FS060	
FirstSurge™ Plus	FS100	
FirstSurge™ Pro	FS140	
FirstSurge™ Flush Mount Kit	XMFMKIT	

1. Use voltmeter to check voltages and ensure correct SPD. See Data Sheet for specs and wire-outs.
2. Determine Mounting location – weather resistant equipment may be required.
3. If SPD has optional Flush Mount Kit, pre-plan its installation. See Figure 3. (If flush mounting, be careful to not drop SPD into wall).
4. Remove power from panel/source. Confirm panel/source is deenergized.
5. Identify breaker location and SPD location. Position SPD such that LEDs are best visible. If Flush Mount Kit was ordered, follow Flush Mount instructions and then proceed at #6.
6. Mount SPD – weather resistant applications require additional sealing, etc. (not included)
  - Remove an appropriately sized knockout from panel.
  - Connect conductors as appropriate – short and straight as possible.
7. Label or mark conductors as appropriate (neutral: white, ground: green, energized: black).
8. Make sure system is bonded per NEC® and is clear of hazards or faults before energizing (N-G bonding not per NEC® will fail SPDs: #1 cause of SPD failures).
9. Energize and confirm proper operation of green LED indicators. If any connected phase LED does not illuminate, remove power, check all connections and test again. If any connected phase LED still does not illuminate, contact Siemens Technical Support at: 1-888-333-3545.
10. The SPD is equipped with an audible alarm which will sound in the event of an alarm condition. This indicates a problem with the SPD which requires further evaluation. There is no test or silence switch. De-energizing the SPD will silence the alarm.

# FSPHONE & FSPHONE4X



## Phone Surge Protection

Siemens FSPHONE is a 2-pair, hardwired surge protector for telephone, DSL or modem connected electronics in residential and light commercial applications. The FSPHONE protects against electrical power surges that can enter through the main telephone connection and is equipped with a failshort device to permanently ground the telephone line in the event of a power cross. The FSPHONE is designed for indoor applications or can be mounted inside another weatherproof enclosure for outdoor mounting applications.

The FSPHONE4X consists of the FSPHONE plus a weatherproof enclosure to facilitate indoor or outdoor applications. The enclosure is molded of temperature and humidity resistant thermoplastic to resist cracking and discoloration. The cover can be secured with a tie wrap or similar locking device.

For total home protection please use FirstSurge™ to protect your incoming AC Power lines and FSPHONE to protect your coaxial connections.

## Features & Benefits

- UL listed
- Hardwired Modem/Fax/DSL protection
- Easy to install
- Exceptionally fast response time
- Low insertion loss
- Available with or without enclosure
- 5-Year product warranty\*

\* See website for warranty terms and conditions.

Technical Specifications	
Catastrophic Surge Circuit	Yes
Spike Capacity	200 Amps
Let Through Voltage	<270 V
Overcurrent Protection	Yes
Response Time	<1 nanosecond
Environmentally Sealed	Yes
Agency Approvals & Warranty	
UL/cUL Listings	497C
Meets Telcordia (formerly Bellcore) GR-974-CORE Requirements for Telecommunications Line Protectors	Yes
Product Warranty	5 Years
Catalog Number	
FSPHONE	2 pair protection module
FSPHONE4X	2 pair protection module & 1 Weatherproof Enclosure

UL Model No. - SATH2

# FSPHONE & FSPHONE4X

## Installation Instructions:

Do not install during active storm conditions.

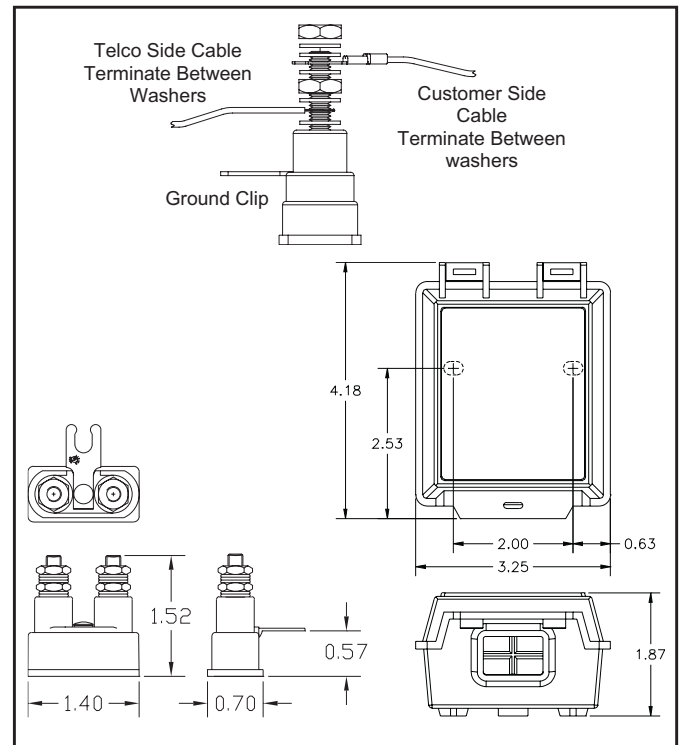
This device can be used indoor (FSPHONE), or outdoor when installed in weatherproof housing (FSPHONE4X). Failure to follow installation instructions can result in personal injury and/or equipment damage not covered by warranty.

FSPHONE – For indoor use:

1. FSPHONE protects 2 pairs (1 pair per protector module) and is intended for indoor use only, without additional housing.
2. Attach securely to mounting surface.
3. Install ground wire, and if applicable, service shield, under top center nut of mounting bracket and tighten nut securely.
4. Connect one pair (tip and ring) under the bottom nut on each protector module, tip on one post, ring on the other.
5. Connect the customer wiring, tip and ring, under the top nut on the same protector module (protector is wired in parallel)
6. Check all wiring for loose connections and shorting or broken wires.

FSPHONE4X – For outdoor use:

1. Mount weatherproof housing securely to flat surface.
2. Conductors will enter and exit from the flexible gromet located at bottom of enclosure.
3. Follow instruction above for FSPHONE connections.
4. Secure enclosure with tie wrap or similar locking device.
5. The FSPHONE4X is a Parallel Device.





# FSCATV

## Direct Protection For Coaxial Connected Electronics



### Cable TV Surge Protection

Siemens FSCATV shields coaxial connected electronics in residential and light commercial applications against electrical transient damage, including lightning, from entering through the main cable connection.

FSCATV includes a section of coaxial cable with female to female splice for line side application. The Siemens warranty covers product defects for 5 years. To have complete protection for your equipment, home, or business, it is important to protect AC power lines and all data lines the equipment is connected through.

### Features & Benefits

- UL Listed
- Rated for CATV, DSS, TV, VCR, and Cable Modem
- Easy to install
- Standard Female to Female F connector
- Low insertion loss
- Automatic recovery
- 5 Year product warranty\*

\* See website for warranty terms and conditions.

### Installation Instructions:

Do Not Install During Active Storm Conditions.

The FSCATV is intended to provide surge protection for customer premises and head end equipment. Proper grounding per CEC code is required. Failure to follow these instructions can result in personal injury and/or equipment damage.

DC Voltage Breakdown Rating (100V/s): 150 - 300VDC

1. Properly ground the unit by connecting grounding wire to ground screw on the surge protector and the ground point nearest to the incoming coax cable line.
  2. Use the supplied coax cable extension line (if necessary) to connect the incoming cable service to side A of the FSCATV and connect side B to the equipment being protected.
- (See Figure 1 or 2)

Technical Specifications	
Frequency Range	DC thru 1.5 GHz
Catastrophic Surge Circuit	Yes
Spike Capacity	5000 Amps, 8/20 $\mu$ Sec
Impedance	75 Ohms
Overcurrent Protection	Yes
Return Loss	30dB @ 1 GHz
Insertion Loss	<0.1dB
Agency Approvals & Warranty	
UL/cUL Listings	497C
Meets IEEE C62.41.1 Requirements	Yes
Product Warranty	5 Years
Catalog Number	
FSCATV	F-Type Inline Coax Protector

UL Model No. - Surgeassure™ SAVFFF

Figure 1. Typical Cable Modem Installation

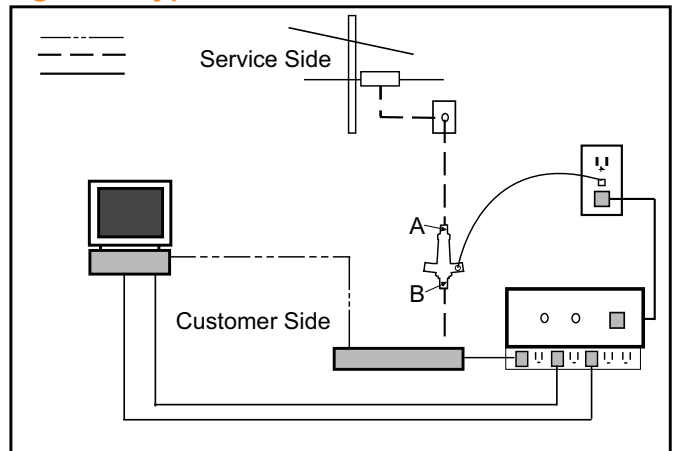
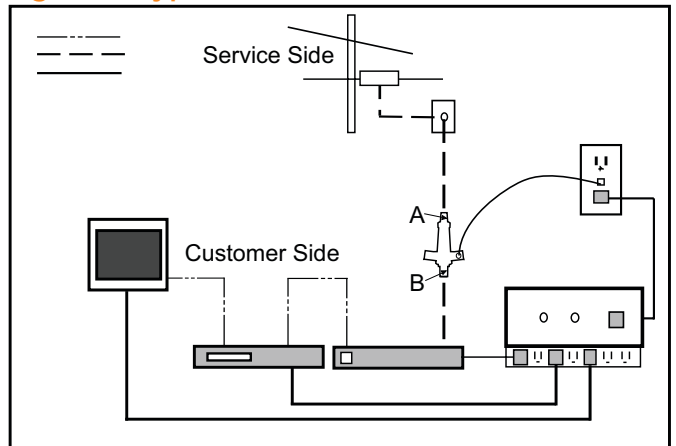
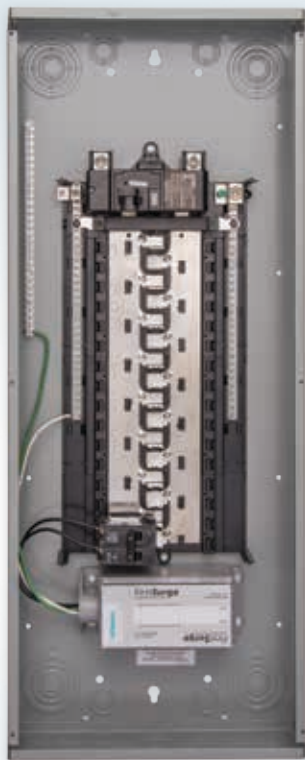


Figure 2. Typical Cable TV Installation



# Surge Load Centers



**Available in:**

- 1 phase, 3 wire, 120/240V
  - 100KAIC max rated
  - Flush or surface mount
    - NEMA 1 indoor enclosure
    - Peak surge rating of either 60kA or 140kA
  - 54 or 60 circuits
  - PL or ES Series (warranty information found on DLC)
- \*No special installation steps required



**Siemens Surge Load Centers** offer a First-Surge device pre-installed on (4) select load center models. A simple solution for added value in new construction.

Catalog Number	Main Breaker	Amp Rating	No. of Spaces	No. of Circuits	Bus Bar Material	Surge Protection	% Neutrals	% Ground
P3054B1200S140	200	225	30	54	Copper	140kA	140%	100%
P4060B1200S140	200	225	40	60	Copper	140kA	140%	100%
S3054B1200S060	200	225	30	54	Aluminum	60kA	100%	50%
S4060B1200S060	200	225	40	60	Aluminum	60kA	100%	50%

# Circuit Breaker and Surge Protective Device (SPD)



## The Siemens Circuit Breaker and Surge Protective Device (SPD)

is comprised of a highly effective TVSS integrated with (2) 1-pole circuit breakers. This device incorporates the robust features of a secondary circuit breaker surge arrester with a lower clamping voltage ratings.

Two green LED indicator lights are provided to show that surge protection is provided for all circuits connected to the panelboard. As a Siemens exclusive feature, the device notifies the owner of loss of surge protection by tripping one or both of the circuit breakers.

The circuit breaker and SPD utilize Siemens-built 150V AC, 40mm, metal oxide varistors (MOVs). The maximum impulse rating for the SPD module is 40kA. The standard interrupting rating for the circuit breakers is 10k AIC. The circuit breakers are SWD and HACR rated.

All Type QP circuit breakers and SPD are plug-on style, with load terminals provided. The devices are rated for 120/240V AC and are calibrated for 40 degrees C maximum ambient applications.

## Features

15 Amp 20 Amp	<b>Catalog Number</b> QSA1515SPD QSA2020SPD
<b>Amperage</b>	15 or 20 Amp
<b>Number of poles</b>	(2) 1-Pole circuit breakers
<b>Initial clamping level</b>	240 Volts
<b>Transient energy rating</b>	360 Joules, line-to-neutral 720 Joules, line-to-line
<b>Transient suppression</b>	500 Volts peak, line-to-neutral
<b>Voltage rating</b>	1000 Volts peak, line-to-line
<b>Peak current rating (impulse)</b>	40,000 amperes
<b>Discharge voltage characteristic</b>	@ 1,500A, 600 Volts, line-to-neutral @ 5,000A, 800 Volts, line-to-neutral
<b>Discharge current withstand rating</b>	10,000 amperes, line-to-neutral
<b>Circuit breaker interrupting rating</b>	10,000A, 120/240V AC
<b>House wiring system warranty amount</b>	\$20,000
<b>Warranty period</b>	24 months
<b>Listings/certifications</b>	UL, CSA, Meets UL 1449 3rd edition



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