

Owner's Manual

SPC-20

SEQUENCING POWER CONDITIONER



Please be sure to read this manual before using this FSR electronic product. Additionally, to be sure of obtaining full protection under the terms of the Limited Warranty in the event that your original ownership documents are lost, fill out and return the Warranty Registration Card immediately. Also verify that the serial number on the Warranty Card matches the serial number on your unit.

POWER PRODUCT GROUP

FSR

Phone: 973-785-4347 Fax: 973-785-3318 Web: www.fsrinc.com E-Mail: sales@fsrinc.com

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INTRODUCTION

Thank you for your purchase of an **FSR SEQUENCING POWER CONDITIONER (SPC-20)** and congratulations on your choice. This equipment, not only sequences the power turn on, it also provides maximum protection from the types of hazards faced by delicate analog and digital pro audio and video equipment.

Your SPC-20 provides the most complete and comprehensive protection from power line-related transient voltages, noise and wiring faults available. It combines a high voltage surge and transient suppressor with an RFI/EMI interference filter. The fast-acting suppression circuit responds in less than a nanosecond, clamping transient voltages to safe levels, the filter works to prevent noise from fluorescent lights, certain dimmers, radio transmitters, and similar sources of “electronic pollution” from contaminating the AC line and from there, leaking into sensitive audio, video, or computer circuits.

What sets the FSR SPC Series apart from other sequencers and conditioners is the use of TRIACS as the switching element instead of relays, which are prone to failure. Also another distinguishing feature is the quantity, quality, and configuration of its suppression devices. These include MOV's,

gas discharge tubes, fast-blow fuses, and high voltage inductors and capacitors. This unique combination can safely absorb and dissipate large spikes from nearby lightning strikes and other sources as well as highly attenuate audible high frequency noise.

NOTE: SPC-20 requires that a safety ground be present for proper operation. Any attempt to operate the SPC-20 without a safety ground is considered improper operation and could invalidate the warranty.

Effects of Lightning

Lightning is a natural phenomenon of overwhelming force that represents the most difficult circumstance faced by a power protection product. The degree of protection a SPC-20 can offer depends on the intensity of the strike. If lightning strikes a distant power line and causes a relatively small disturbance to reach your location, the spike suppressors in the SPC-20 will absorb the excess voltage invisibly and harmlessly. However, if lightning strikes the actual building where the SPC-20 is installed (or somewhere very nearby) some damage may be unavoidable due to the extremely high voltage and current present. If this does occur, most likely damage will be limited to the SPC-20 itself and will affect only certain spike suppression components (called varistors or MOV's.) In this “suicide” mode, the SPC-

20 may sustain minor damage but generally will protect all equipment plugged into it from much more serious and costly damage as long as the equipment is properly grounded. Proper grounding requires the use of three-prong AC cords, and that the building's outlets are actually grounded to earth as specified by local building codes.

Any SPC-20 known to have taken a direct lightning hit should be checked by a qualified technician or the FSR factory to determine whether the MOV's need replacement. **If the surge circuits indicator is not lit, there is definitely some damage. Some spike suppression capability may still be available, but there is no guarantee of this.**

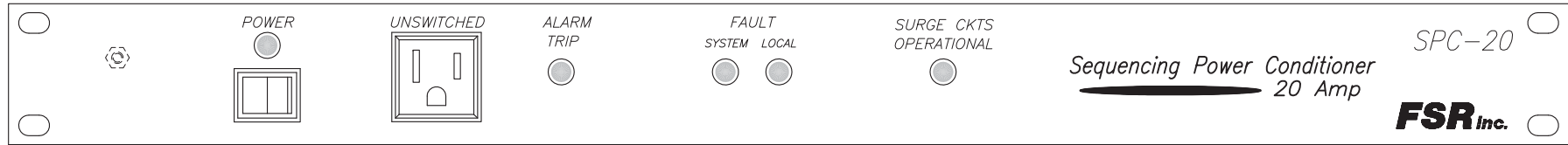
For optimum protection, you should not rely exclusively on the SPC-20 to protect against a direct lightning hit. The first line of defense against lightning should be a lightning arrestor installed on your building's electrical service entrance. If your building does not have one, contact your local power company or a contractor to have one installed.

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SPC-20 FRONT PANEL



SYSTEM POWER SWITCH AND LED: when the system LED is off, pressing the system switch will start the turn-on procedure, and the LED will illuminate. When the system LED is on, pressing the system switch will start the turn-off procedure, and the LED will turn off. This LED blinks on power up and power down until the cycle is complete.

UNSWITCHED OUTLET: this outlet is active at all times the equipment is plugged in.

TRIP LAMP: a ground closure on the remote trip input (rear panel remote control strip) will sequence the system down and latch on the trip lamp. After the remote trip input is cleared, the trip lamp can be reset by pressing the momentary system power switching.

SYSTEM FAULT LAMP: this supervisory indicator will illuminate to indicate that an enabled AC circuit is not receiving AC power (faulty output circuit), or that a disabled AC circuit continues to receive power (incorrect system wiring, shorted output circuit, etc.). A system fault indication will be provided when a fault indication is detected in the SPC-20 or any expansion stages.

LOCAL FAULT LAMP: this supervisory indicator will illuminate to indicate that a fault has occurred at this local unit. A local fault on any unit in the system will also activate the system fault lamp.

NOTE: System and Local Fault lamps can be illuminated if any of the three switched rear AC outlets are unloaded. All outlets should be connected to a load for proper lamp indication.

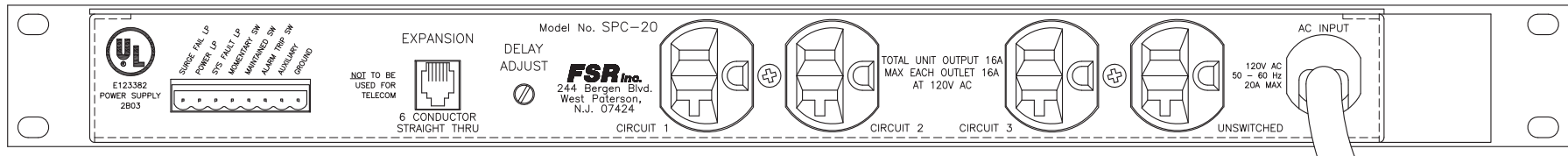
SURGE CIRCUITS OPERATIONAL: provides supervisory indication that the surge suppression circuitry is fully functional.

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SPC-20 REAR PANEL



Rear Panel Control Functions:

NOTE: All remote control and expansion port connections are short circuit and overload protected.

REMOTE CONTROL PORT: This pluggable screw terminal provides for remote operation of the SPC-20 as follows:

SURGE FAULT LAMP: Provides 12 volts at 100 ma when the surge circuits are worn out. It is in a high impedance state when off.

POWER LAMP: Provides 12 volts at 100 ma when the system is on. High impedance when the system is off.

SYSTEM FAULT OUTPUT: This output goes high (+12V) when there is a fault on the local or expansion units. Output rated at 100 ma.

NOTE: While each lamp output is rated at 100 ma total current draw from all three together should not exceed 150 ma.

SYSTEM MOMENTARY SWITCH: This input may be used to remotely control power-up/down of the system from momentary contact switch. Multiple control locations may be used by connecting switches in parallel.

SYSTEM MAINTAINED SWITCHED: This input may be used to remotely control power-up/down of the system from a security key switch or other maintained closure source. Only one control location may be used with a maintained switch input.

ALARM TRIP SWITCH: A closure on the remote trip input from the fire alarm or other emergency shutdown system will latch the trip lamp and initiate a power-down sequence. This input will override all local and remote inputs for the duration of the closure. To clear the trip if a momentary switch is used to power up the system, just press the system on/off switch off and then on. A system using a maintained switch will automatically power up once the trip input is cleared.

AUXILIARY: This output provides a ground closure when the rack circuit is enabled. Output rated at 100 ma.

GROUND (GND): All switch inputs and lamp outputs are referenced to ground.

EXPANSION PORT: Control for expansion units. It requires a standard 6 conductor telephone type (RJ) cable wired straight through (pin 1 to pin 1 etc.). **DO NOT PLUG IN A TELEPHONE.**

DELAY ADJUST: Trim control enables the user to set the initial delay (going from circuit 1 to circuit 2 over a range of 1 to 50 seconds. All subsequent delays will be one to three seconds, dependent on the adjustment.

NOTE: See specifications section for details about the timing sequence.

CIRCUIT 1 OUTLET: This half of the duplex outlet will provide 120 VAC upon activation of the system on switch.

CIRCUIT 2 OUTLET: This half of the duplex outlet will provide 120 VAC after the initial delay time.

CIRCUIT 3 OUTLET: This half of the duplex outlet will provide 120 VAC after the faster delay.

UNSWITCHED: This half of the duplex outlet is powered all the time the unit is plugged in. Both this outlet and the one on the front have surge protection as well as line filtering.

20 AMP LINE CORD: must be plugged into a true 20 amp outlet.

NOTE: THE TOTAL CURRENT, FROM ALL RECEPTACLES, THAT MAY BE DRAWN FROM THIS UNIT IS 16 AMPS (UL REQUIREMENT).

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SPC-20 SPECIFICATIONS

AC INPUT 120VAC, 60 Hz, 20Amps max.

AC INPUT: Full line conditioning and RFI suppression

AC SWITCHING: Solid state zero crossing (no relays that bounce, arc, and pit)

AC OUTLETS: Surge suppression on all outlets

AC OUTLETS: Total of five outlets, two (one on the front panel and one on the rear panel) are active, the other three are switched on/off in sequence. **Total output current must not exceed 16 Amps. Each AC outlet is rated at 16 Amps but remember that the total current out of the SPC-20 must not exceed 16 Amps.**

SURGE PROTECTION: Spike protection modes: Line to neutral, neutral to ground, line to ground
Spike protection voltage: Max clamping voltage 340V peak, L-N, N-G, L-G
Response time: 1 nanosecond
Maximum surge current: >100,000 AMPS (8x20 usec pulse)
Maximum spike energy: >1000 joules
Noise attenuation: Differential 13 dB @ 150 kHz increasing to 45 dB @ 30 Mhz
Common mode: 15 dB @ 150 kHz, increasing to >45 dB @ 30 Mhz

SWITCHING DELAY: 1 to 50 seconds adjustable on the rear panel. This is the delay from circuit 1 to circuit 2. All subsequent delays will be one to three seconds, dependent on the adjustment.

Example:

When the SPC-15 power is powered up, via either the front panel power switch or via remote triggering and you have chosen to set the delay to 20 secs:

The SPC-15 "circuit 1" turns on within 1 sec.

Then, the SPC-15 "circuit 2" turns on in 20 secs.

Then, the SPC-15 "circuit 3" turns on in 22 secs.

Then, the first SPC-15X expansion module turns on in 24 secs.

Then, the second SPC-15X expansion module turns on in 26 secs. and so on for additional SPC-15X modules.

When the SPC-15 power is powered down, via either the front panel power switch or via remote triggering, all delays happen in reverse:

The last SPC-15X expansion module turns off first. Additional SPC-15X expansion modules will continue to turn off in sequence at 2 second intervals.

Then, 2 secs later, after all the SPC-15X expansion modules have sequenced off, the SPC-15 "circuit 3" turns off

Then, 20 seconds later, the SPC-15 "circuit 2" turns off

Then, within one sec, "circuit 1" turns off

REMOTE CONNECTOR: Includes all connections for remote control of the unit (pluggable screw terminal connector)

REMOTE CONTROL: Momentary or maintained closure will operate this equipment. A lamp feedback signal (voltage) is also provided.

EXPANSION CONNECTOR: Feeds the first expansion unit if used data connector 6 wide RJ 12) wire this connector straight through.

NOTE: THIS IS NOT TO BE USED AS A TELECOM INPUT. DO NOT PLUG A TELEPHONE INTO THIS CONNECTOR

SIZE: 19" wide, 1.75" high and 8.5" deep

WEIGHT: 14 lbs

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LIMITED WARRANTY

The FSR SPC-20 is warranted against failures due to defective parts or faulty workmanship for a period of three years after delivery to the original owner. During this period, FSR will make any necessary repairs without charge for parts or labor. Shipping charges to the factory or repair station must be prepaid by the owner; return-shipping charges (via UPS Ground) will be paid by FSR.

This warranty applies only to the original owner and is not transferable. Also, it does not apply to repairs done other than by the FSR factory or authorized Repair Stations.

This warranty shall be cancelable by FSR at its sole discretion if the SPC-20 unit has been subjected to physical abuse or has been modified in any way without written authorization from FSR. FSR's liability under this warranty is limited to repair or replacement of the defective unit. FSR will not be responsible for incidental or consequential damages resulting from the use or misuse of its products. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Warranty claims should be accompanied by a copy of the original purchase invoice showing the purchase date (if a Warranty Registration Card was mailed in at the time of purchase, this is not necessary). Before returning any equipment for repair, please read the important information on service below.

SERVICE

Before returning any equipment for repair, please be sure that it is adequately packed and cushioned against damage in shipment, and that it is insured. We suggest that you save the original packaging and use it to ship the product for servicing. Also, please enclose a note giving your name, address, phone number and a description of the problem.

NOTE: all equipment being returned for repair must have a Return authorization (RA) Number. To get a RA Number, please call the FSR Service Department (973-785-4347). Please display your R/A Number prominently on the front of all packages.

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