

# PROTEK SRS Drill INTERRUPTER

## General Information

**What the PROTEK SRS does** -- The PROTEK SRS Drill Interrupter is designed to stop power to a drill upon contact between the drill bit and grounded metal, such as piping, conduit, or reinforcement steel - helping the operator avoid drilling through the grounded metal object.

**Requirements** -- The PROTEK SRS operates on 110-120 volts, 60 Hertz AC, and requires a grounded wall outlet. The drill must be a three-wire grounded drill. All extension cords must be three-wire, grounded cords.

**How it works** -- The PROTEK SRS relies on a current loop (control loop) involving the grounding system in the PROTEK, the drill, the building electrical ground system, the wall outlet, and any extension cords.

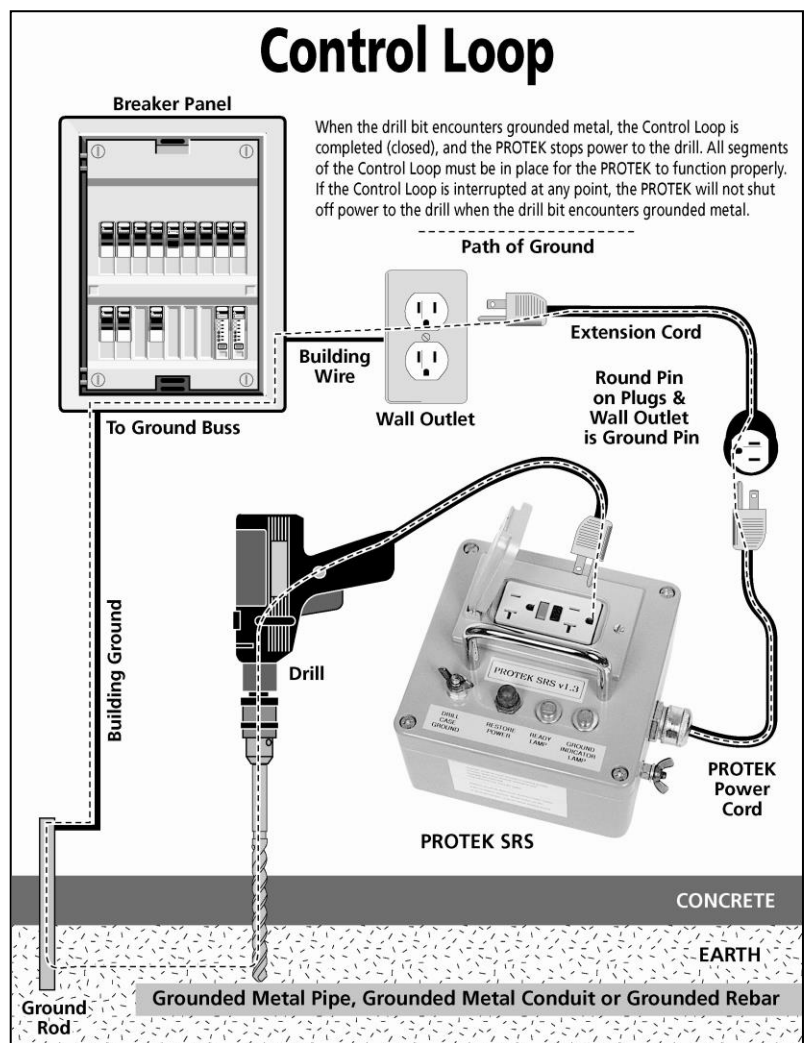
The PROTEK SRS places a 12-volt AC electrical potential on the ground wire of the drill's power cord, drill frame, and drill bit. When the drill bit contacts grounded metal - such as grounded conduit or rebar - the control current travels through the metal object and then through the building's electrical grounding system back to the PROTEK, which causes the PROTEK to trip and shut off power to the drill.

If any part of the control loop is missing, intermittent, or improperly connected, the PROTEK SRS cannot stop the drill when the pipe or conduit is encountered.

### **Examples of factors which would disrupt the control loop include:**

- The wall outlet is not grounded.
- An extension cord with a broken or missing ground wire is used.
- The metal object encountered by the bit is not electrically grounded. (Desks, workbenches, loose metal, exposed piping, "floating" rebar, and most post-tension cables are a few examples of metal objects which may not be electrically grounded.)
- The drill is a two-wire, double-insulated drill.
- The ground wire in a three-wire, grounded drill is broken or intermittent.

**What the PROTEK SRS cannot do** -- The PROTEK SRS cannot guarantee that a drill bit will not penetrate a metal pipe, conduit, or reinforcement rod. The PROTEK SRS can, and does, help a drill operator avoid drilling through most grounded metal objects.



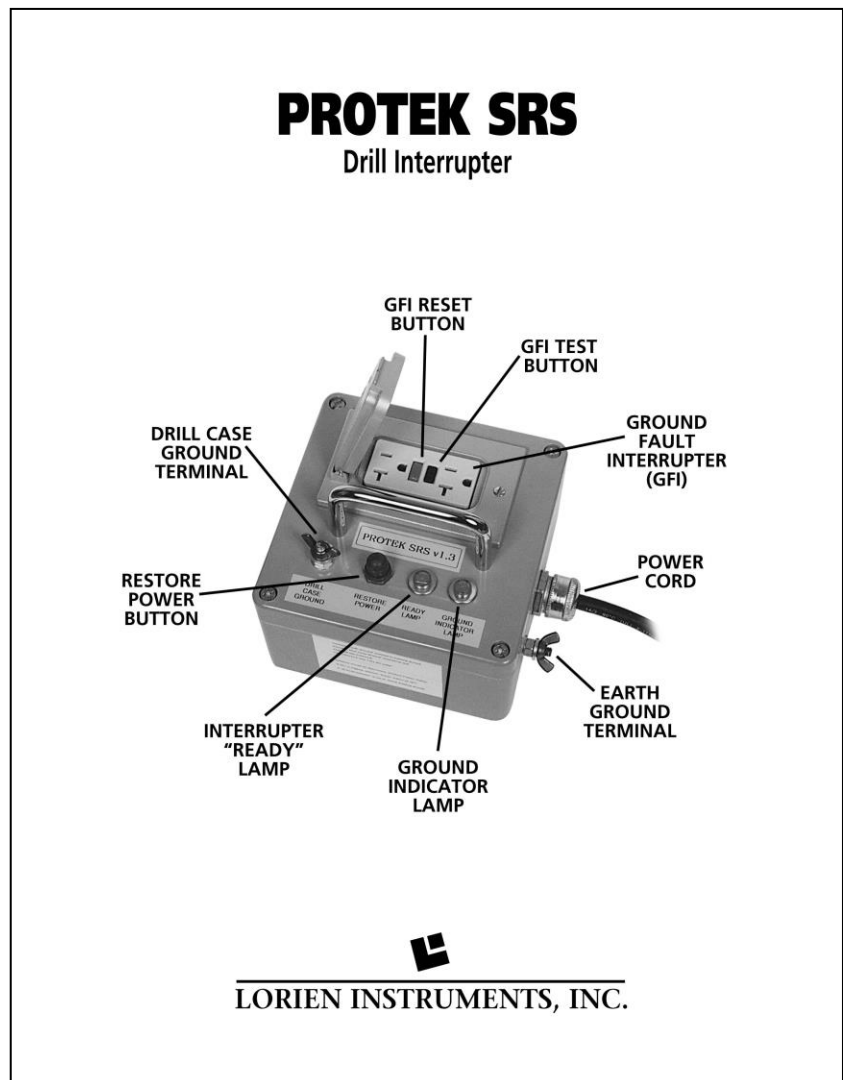
Experience has shown that the proper use of a PROTEK SRS is effective in reducing damage to metal pipes and conduit in the vast majority of situations in which rotary-hammer drills are utilized. Due to the extreme variability in building design, however, the PROTEK SRS should only be considered as an aid to drill operators to help avoid drilling through grounded metal piping, conduit, and reinforcement steel. All normal precautions should be taken - including the use of building plans, estimation of piping and conduit routing, and the use of the PROTEK SRS - to help reduce the possibility of pipe or conduit breakage while drilling.

Factors which can contribute to the failure of a properly-used PROTEK SRS to stop a drill in time to avoid damaging a pipe include the drill bit encountering old, corroded piping; very thin-walled copper tubing; poorly installed pipe fittings; or non-standard piping installations.

**Shock protection** -- The PROTEK SRS utilizes a built-in "ground-fault-interrupter (GFCI)" to offer the drill operator an extra measure of shock protection. The GFCI shock protection circuitry works independently from the PROTEK SRS pipe protection circuitry.

There are two different ways in which the PROTEK SRS can "trip". When grounded metal is encountered, the PROTEK SRS pipe protection circuitry "trips". When a shock hazard exists, the GFCI shock protection circuitry "trips". The PROTEK SRS pipe protection circuitry is reset by depressing the gray "Restore Power" button. The GFCI shock protection circuitry is reset by depressing the "Reset" button on the GFCI outlet. The GFCI shock protection circuitry helps protect the tool operator against "line-to-ground" faults only, such as when a drill short-circuits to its case or when a drill's power cord short-circuits. The GFCI cannot protect the operator from drilling directly into a "hot" electrical wire.

**Testing the PROTEK SRS** -- The PROTEK SRS should be tested each and every time it is used by plugging the PROTEK SRS into the wall outlet or extension cord, and plugging the drill into the PROTEK SRS. If both indicator lights are "on", touch the drill bit to a grounded metal water pipe or conduit. The unit should trip, and power should to the drill should be interrupted.



## **SECTION II - NORMAL PROTEK SRS OPERATION**

- 1) Plug the 3-wire, grounded drill into the PROTEK.
- 2) Plug the PROTEK into a 3-wire, grounded, 110-120 volt AC wall outlet or extension cord.
- 3) Initialize the trip-protection circuit by depressing the "Restore Power" button.
- 4) If the GFCI is tripped, depress the "Reset" button on the GFCI. Note: the Protek must be plugged-in to an energized wall outlet or extension cord before a tripped GFCI can be reset.
- 5) Both the "Ground Indicator Lamp" and the "Ready Lamp" should be lit. If the "Ground Indicator" lamp is not lit, check the connection to building ground.
- 6) The PROTEK SRS should trip instantly when the drill bit touches grounded metal. Restore power to the drill by depressing the gray "Restore Power" button.

## **SECTION III - Ground Indicator Lamp does not light**

If the "Ground Indicator Lamp" will not light, it typically means that the PROTEK SRS is not properly grounded. This is usually caused by one of the following:

- 1) Broken or missing ground wire between the PROTEK SRS and the wall outlet. The PROTEK SRS power cord, extension cord, and the wall outlet all must have good ground wires and plugs.
- 2) No power at the outlet. Plug the tool directly into the outlet to see if there is power to the outlet.
- 3) Broken PROTEK SRS. Recheck steps 1 and 2. If unit fails to work properly, return to factory for repair.

## **SECTION IV -- PROTEK SRS fails to trip properly**

If both indicator lights are "on" and the PROTEK SRS fails to trip properly during testing, try the following:

- 1) Depress the "Restore Power" button.
- 2) Depress the "Reset" button on the GFCI outlet.
- 3) Check for a broken, intermittent, or missing ground wire in the drill's power cord and plug. The PROTEK trip circuit only works with grounded drills.
- 4) Be certain that the metal which the bit encounters is grounded. Many metal desks, workbenches, door frames, and other above-ground metal objects are often not electrically grounded.
- 5) Broken PROTEK SRS. Return to factory for repair.

## **SECTION V – Redundant grounding**

- 1) If redundant grounding is desired, attach a 14 gauge or larger wire between the **Drill-Case Ground** terminal on the PROTEK and a grounding point on the drill case or chassis that is electrically grounded to the drill bit.
- 2) The **Earth Ground** terminal on the PROTEK may be directly wired to the building's grounding system, if desired. The Earth Ground terminal should be connected to an effective grounding source, such as an unpainted metal water pipe or section of properly-installed metal conduit.

## **Special Situations**

**Moist earth** is an excellent conductor of electricity, so the PROTEK SRS may trip if the drill bit encounters moist earth after going through the bottom of a hole.

**Core Drilling** - When using the PROTEK with a core drill, contact between nearby grounded metal surfaces and the water which is used to lubricate or cool the core bit may cause the PROTEK to trip without the core bit encountering grounded metal directly.

**Post-Tensioned Cabling** – Field experience has shown that the PROTEK SRS can be effective in reducing damage to some PT cabling. PT cables must be grounded in order for the PROTEK to stop power to the drill. If the cables are not grounded, but if the ends of the cables are exposed, the operator can use 14 gauge or larger wires to physically jumper between the cable(s) and the “Earth Ground” terminal on the PROTEK SRS. This attachment grounds the cables to the PROTEK, and the unit should trip when the drill bit encounters the PT cabling.

**Portable Generators** – when using portable generators to power the PROTEK, the generator’s grounding terminal should be wired directly to the building ground system (if possible). The key concept to remember is that there needs to be an electrical grounding connection between the metal that you are trying to avoid (conduit, rebar, PT cabling, piping, etc.) and the grounding terminal on the generator (or directly to the PROTEK SRS **Earth Ground** terminal).

**Corroded piping** - Occasionally, when soft copper pipe or old, corroded pipe is encountered, the momentum of the drill bit and the weight of the operator will allow the bit to penetrate the pipe wall, even though power to the drill has been interrupted.

**Current Rating** -- 15 amps.

**Caution** -- Always wear gloves when operating the PROTEK. A slight, low-voltage shock may be felt when handling the drill bit and the "Drill Case Ground" terminal, especially when the operator is wet from perspiration. The PROTEK’s 12-volt AC, low-current control loop voltage is usually not detectable by touch and is not harmful.

**Warranty** -- Each PROTEK SRS is thoroughly tested and inspected at the factory prior to shipment. Lorien Instruments, Inc. offers a one year warranty on parts and labor on the PROTEK SRS. Standard warranty terms apply.

**Repair instructions** -- All PROTEK units are repaired at Lorien's main facility in Texas. Ship the broken unit, along with a contact name, your return billing address, your return shipping address (not a P.O. Box), email address, and telephone number to:

**Lorien Instruments, Inc.**  
Attn: Repair Department  
101 County Road 492  
Muenster, Texas 76252  
(940) 759-2525

### **FOR FURTHER ASSISTANCE -**

**Lorien Instruments, Inc.**  
P.O. Box 8  
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(940) 759-2525  
[www.lorien.com](http://www.lorien.com)