

PROTEK SRS Drill INTERRUPTER

Section I -- 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 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 or be modified with an external ground wire. 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 used.

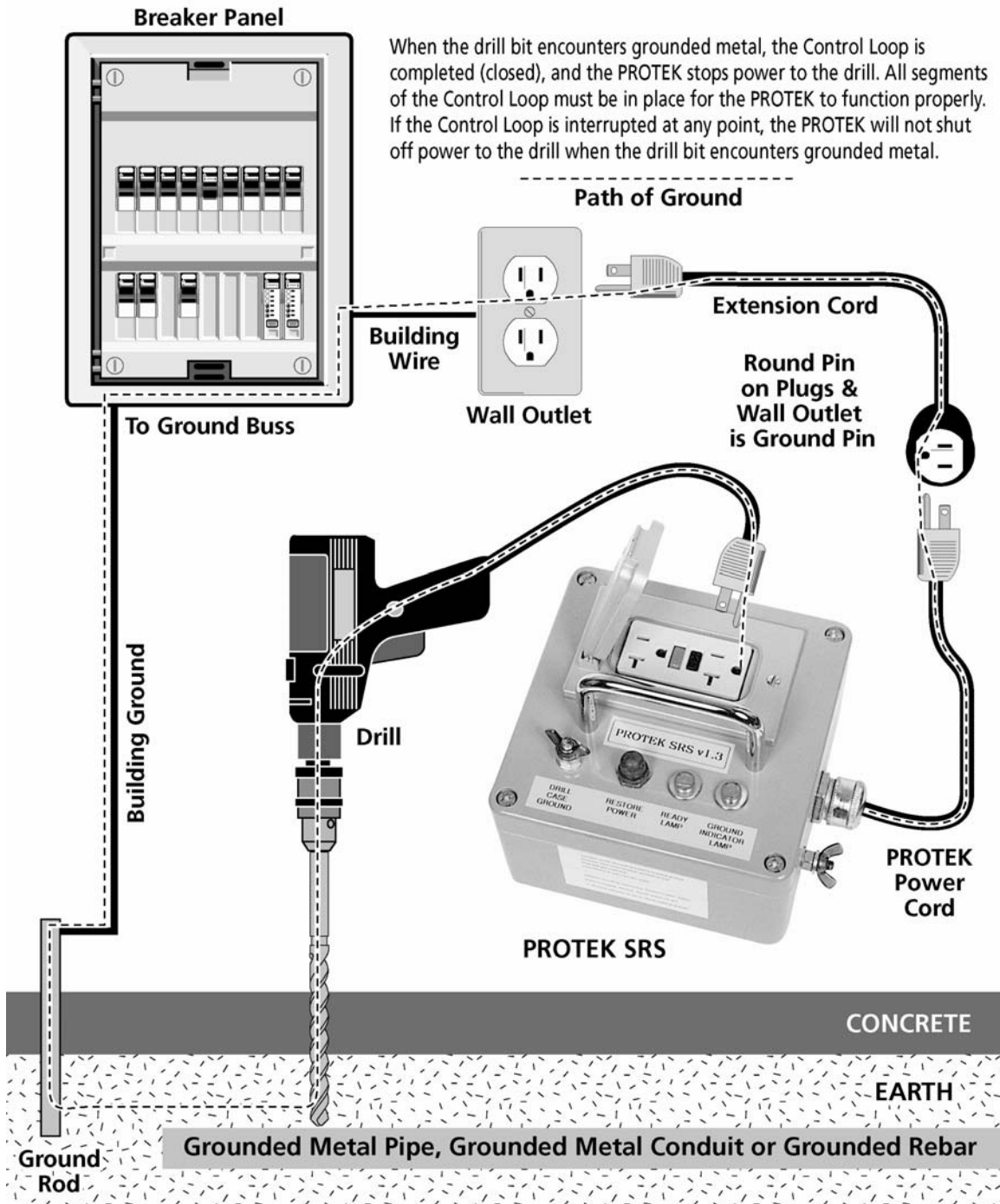
The PROTEK SRS places a small (12 volt AC) electrical potential on the ground wire of the drill's power cord, drill frame, and drill bit. When the drill bit contacts grounded metal, such as a section of conduit, the control current travels through the conduit, through the building's ground system, through the ground buss of the electrical breaker panel, and back to the PROTEK. Instantly, when the drill bit closes this control loop by contacting grounded metal, relays in the PROTEK SRS trip - shutting off power to the drill and shunting drill bit current to ground.

*** Please see Control Loop drawing ***

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 grounded. Metal desks, some above-ground piping, steel reinforcement rods which are 'floating' in the concrete, some metal ductwork, and old corroded piping with poor electrical conductivity properties are all examples of metal objects which might 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.
- The ground wire in the PROTEK SRS is broken.

Control Loop



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.

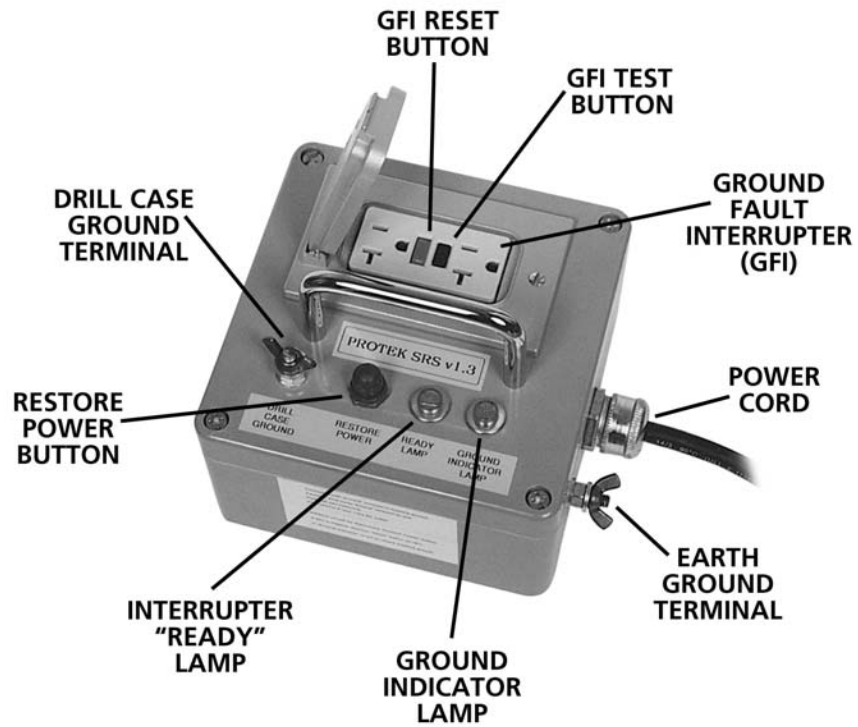
Shock protection -- The PROTEK SRS utilizes a built-in "ground-fault-interrupter (GFCI)" to offer the drill operator an extra measure of shock protection. The GFCI shock protection circuitry works independently from the PROTEK SRS pipe protection circuitry.

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.

PROTEK SRS

Drill Interrupter



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SECTION II - NORMAL PROTEK SRS OPERATION

- 1) Plug the 3-wire, grounded drill into the PROTEK.
- 2) If redundant grounding is desired, attach a 12 ga. or larger wire between the Drill-Case Ground Terminal and a grounding post or grounded case screw on the drill. Connect the "Earth Ground" terminal to the building's grounding system.
- 3) Plug the PROTEK into a 3-wire, grounded, 117 volt AC wall outlet or extension cord.
- 4) Initialize the trip-protection circuit by depressing the "Restore Power" button.
- 5) 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.
- 7) 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.
- 8) 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. 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.
- 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 ground wire in the drill's power cord, or for an improper or ineffective drill-case-ground connection. If this part of the control loop is broken or missing, the PROTEK SRS will not trip.
- 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 not electrically grounded.
- 5) Broken PROTEK SRS. Return to factory for repair.

Special Situations

Moist earth is an excellent conductor of electricity. Occasionally, while drilling a slab, the PROTEK SRS may trip after going through the bottom of a hole. If the unit trips before the hole is completed, it usually means one of two things: the bit has touched a grounded metal object, or the bit has encountered moisture. If the operator is certain that the PROTEK has tripped due to moist earth, the operator may have the option, depending upon facility protocol, of bypassing the PROTEK by plugging the drill directly into the extension cord and completing the hole.

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.

The PROTEK SRS was originally designed to stop power to a drill upon bit contact with grounded metal such as conduit, water pipes, and rebar. In theory, the SRS should stop power to a drill upon bit contact with **grounded metal post-tensioned cabling**. As of this time, Lorien Instruments has not conducted definitive testing of the PROTEK SRS on grounded post-tensioned cable systems and makes no claim of suitability for that purpose.

Occasionally, when soft copper pipe or old, corroded pipe is encountered, the momentum of the drill bit will allow it to penetrate the pipe wall even though power to the drill has been interrupted. While this is a rare event, this possibility always exists. The PROTEK cannot guarantee that pipes will not be broken. It can and does help prevent broken pipes.

Current Rating -- The maximum current load of a power tool used with the PROTEK SRS should not exceed 15 amps. When operated with 12 gauge or larger grounding jumpers, the minimum continuous shunt-current rating of the PROTEK SRS is 20 amps.

Caution -- Always wear gloves when operating the PROTEK drill interrupter. A slight, low-voltage shock may be felt from the drill bit, the drill case, the "Drill Case Ground" terminal, or exposed metal surfaces on the GFCI cover when handled without gloves. This 12 volt AC, low-current condition is caused by the PROTEK's control circuit and is not harmful to a normally healthy person.

Note -- Depressing the GFCI test button excessively may shorten the lifespan of this component. Lorien Instruments recommends testing the GFCI on a daily basis.

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 each PROTEK SRS and will repair any defective PROTEK SRS at its Texas manufacturing facility free of charge with proof of purchase within one year of the date of purchase. Negligence or abuse of a PROTEK SRS will void the warranty.

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), and telephone number to:

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

FOR FURTHER ASSISTANCE - CALL OR WRITE:

Lorien Instruments, Inc.
P.O. Box 605
Muenster, TX 76252
(940) 759-2525
(888) 658-8030 Toll Free
www.lorien.com