



Ditch Witch Electric Strike System Overview

Any time you drill in an electric jobsite, electric strike system must be properly set up, tested, and used. The drill operator and tracker must wear protective boots and the drill operator must have gloves within reach meeting the following standards:

- Boots must have high tops and meet the electric hazard protection requirements of ASTM F2413-05, when tested at 18,000 volts. Tuck legs of pants completely inside boots.
- Gloves must have 17,000 AC maximum use voltage, according to ASTM specification D120-87. If working around higher voltage, use gloves and boots with appropriately higher ratings.

NOTICE: The strike system does not prevent electric strikes or detect strikes before they occur. **If alarms are activated, a strike has already occurred** and equipment is electrified.

Purpose:

To alert the operator, crew and bystanders when an electrical strike has occurred that is potentially dangerous. The drilling unit may or may not be electrified.

Components:

- Voltage stake – this is to be located away from the machine. It detects the voltage difference between the ground stake and the drilling machine.
- Current transformer – detects current flowing through the drill string.
- Reset/status button – used to recheck the status if the alarm sounds.
- Self-test – the self-test should be done every time the machine is used.
- Alarm – if the alarm sounds, assume a strike has occurred.
- Strobe light – provides a visual alert that a strike has occurred.

Function:

Dual detection system.

- Voltage detection via voltage limiter
- Current detection via current coil



The system will only activate alarm when voltage, current, or a combination of both voltage and current is above threshold limits.

- Voltage Threshold = 30 Volts AC
- Current Threshold:
 - Original analog system = 100 mA AC
 - Current digital system = 300 mA AC
- The ESID will alert you when an active electric line has been struck and more than 300 mA AC of current is being detected at the current transformer. Current traveling up the drill string is detected by a coil surrounding the drill pipe.
- The ESID will alert you when an active electric line has been struck and more than 30 VAC is detected between the drill unit and the voltage limiter stake. Voltage difference between the voltage limiter and the drilling unit is monitored by the ESID. When this voltage differential increases over 30 VAC the ESID will activate the alert.
- An alarm condition is when the total of “A” and “V” are equal to or greater than 100% in any combination.
 - 6% of voltage (30 Volts) is 1.80 Volts
 - 6% of amperage (300 mA AC) is 18 mA
 - 6 % (V) + 6 % (A) is 12 % of a strike

Testing of strike system:

Internal Self-Test

- Control Module – the ESID system checks the internal circuitry of the control module to ensure that all of its components are operating within tolerance.
- Voltage Limiter – the ESID system checks to ensure that there is a connection to ground through the voltage limiter which should be attached to the ground stake.
- Current Transformer – the current transformer is designed with a built-in coil wrapped around the transformer. The ESID system applies a small current to this small coil and ensures that the current applied is properly detected.

Test using ESID Strike Simulator (CMW Part #259-506)

- Voltage Limiter – the strike simulator leads are attached to metal on the frame of the machine and to the clamp on the voltage limiter. The simulator, when set to “voltage” and the test button depressed, will apply a voltage at low current across the leads. The strike system should detect the voltage difference from the machine to the voltage limiter. The strobe and alarm should activate and the display screen should indicate 90-110% for voltage.
- Current Transformer – the strike simulator leads are looped/wrapped through the current transformer and connected to each other. When the simulator is set to “current” and the test button depressed, a current will be applied through the leads. This creates a field that is detected by the current transformer. The current can be increased by looping/wrapping the leads



through the current transformer two or three times. The display screen should indicate 30-50% for current with only one loop; the strobe and alarm may activate intermittently and the display screen should indicate 80-110% with two loops; the strobe and alarm should be on continuously and the display screen should indicate 130-160% with three loops through the current transformer.

In the event of a strike:

On the Boring Unit or Grounded Mat

- DO NOT MOVE. Remain on boring machine or mat.
- Warn people nearby that an electric strike has occurred.
- Have someone contact electric company.
- Reverse boring direction and try to break contact. Do not touch drill pipe with hands or hand held tools.
- Press Electric Strike System status button.
- If alarm sounds again, stay where you are and wait for electric company to shut off power.
- If alarm does not sound and there is no other indication of a strike, wait at least one full minute before moving away from equipment. Utility might use automatic reclosers which will restart current flow. If alarm sounds again while waiting, stay where you are until electric company shuts off power.
- If alarm does not sound but all lights in strike indicator are on, assume strike is continuing and stay where you are until electric company shuts off power.
- Do not resume boring or allow anyone into the area until given permission by electric company.

Off Boring Unit or Bonded Ground Mats

- DO NOT TOUCH ANY EQUIPMENT connected to boring unit.
- Stay where you are unless you are wearing electric insulating boots. If you leave, do not return to area or allow anyone into area until given permission by electric company.