HOT STICK USA, INC.

DATASHEET

Made with the First Responder in Mind

- Early warning of high voltage AC
- Safe and simple to use
- Exceptionally sensitive. Patented circuits give outstanding range.
- Affordable, sturdy, reliable
- Portable, battery-powered
- A must for the first responder

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Introduction

The Hot Stick USA AC provides warning of exposed high voltage AC from a safe distance. The AC Hot Stick will give early audible and visual warning of the presence of AC voltages without the need to contact the surface which carries the dangerous AC potential. The AC Hot Stick will beep and an LED will flash with an increasing rate as the unit is brought closer to the source.

The tool has found many applications especially with first responders, fire, police and ambulances responding to vehicular accidents; with search and rescue operations in urban and rural settings as well as with cleanup crews working on downed trees after wind and ice storms. But also industrial user and anybody else who may unknowingly be exposed to the dangers of electrical shock or electrocution will appreciate the AC Hot Stick.

While the instrument will not be able to "*see*" the AC voltage if grounded metal shields or conductors surround the source fully and prevent the signal from emanating, floating grounds or incomplete shielding will be noticed quickly.

Its simple-to-use, built-in self tests, sturdy construction and small improvements made over time based on our customer comments have made the AC Hot Stick a safety tool, recognized and respected by its many users.

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Description

The AC Hot Stick consists of a high sensitivity AC amplifier for the frequency range below 100 Hz. The special logarithmic amplifier is capable of receiving AC signals over a very wide amplitude range. Such signals, emanating from an unshielded, voltage-carrying surface, can be made audible and visible as a warning.

The warning signals (*beeps and LED flashes*) will increase when the signal increases as the AC Hot Stick approaches the source. This makes it possible to locate the source quickly. In the presence of high tension wires the sensitivity can be reduced by selecting the Low sensitivity or the Front Focused mode. The sensing section of the AC Hot Stick is located in the red striped area. When used in the High or the Low sensitivity mode the unit will respond to signals from all sides (*is omni-directional*). When the Front Focused mode is selected the unit responds only to signals received from the front of the AC Hot Stick. This reduces the sensitivity and concentrates pickup into a small frontal area. This permits pinpointing of the source and distinguishing between adjacent wires.

The detector will not respond to DC voltages from car batteries or from the third rail in light rail transit vehicles operating on DC. The unit features a complete self-test circuit: Immediately after turn-on, a built-in low frequency oscillator will operate for about 3 seconds simulating power line signals. This provides a separate test signal to the input. Rapid beeping indicates proper operation of the set.

A low voltage watchdog circuit monitors the built-in batteries. It will make the unit beep continuously and prevent its use in case of weak batteries. The set does not require warm-up and is operational about 10 seconds after turn-on. In normal use with intermittent operation, a set of standard AA alkaline batteries will typically provide one year of service. If left on continuously the batteries will run down in about 300 hours. In order to assure operation and to prevent battery leakage, the batteries should be changed annually.

After unscrewing the lanyard the batteries are accessible. Battery change should be done only in a safe atmosphere. The electronics circuitry is mounted on a printed circuit board housed in a sturdy, fully insulating plastic pipe. The set is splash-water proof. It has been designed to be intrinsically safe for operation in potentially explosive atmospheres. Hermetically sealed switches and quality components are providing reliable operation and long life even in severe environments.

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Applications

Urban Search & Rescue:

Detection of unknown sources of unshielded and potentially hazardous AC voltages. Verification of proper power disconnect.

Fire:

Identification of nearby high voltages and dangers from electrical wires during size-up, and after fires, during overhaul and investigations.

Vehicular Extrication:

Quick check of site and vehicle for potential exposure to AC voltage. Verification and monitoring of power disconnect.

Confined Space Rescue:

To verify power shut-off and proper lockout at the entry site and of machinery and equipment posing hazard through accidential activation.

Hazmat:

Avoid dangers of electrical shock or explosion caused by electrical shorts/ arcs.

Disaster Operations:

After earthquakes, wind and ice storms or floods to identify energized wires on roads or structural parts in collapsed buildings and flooded sites. Quick check of extent of power outage.

Power Restoration:

Warning of energized wires hidden by fallen trees or caused by back-feeding from motor generators.

Industrial:

During plant modification or industrial rescue to prove power disconnect, identify alternate sources or ungrounded machinery.

Trench Rescue:

Locate potential sources of electrical shock during rescue operations.

Law Enforcement:

Detect presence of AC voltage, avoid electrical hazards at accident scences or during search, prisoner detention, and surveillance.

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Detection Range

The red striped area of the AC Hot Stick indicates the sensing section of the electronics circuitry. The AC Hot Stick has the unique capability to warn the user of the presence of high voltage from a safe distance. At what distance between the source and the sensing section a warning will occur depends on a number of factors.

The detection range depends primarily on:

- **The setting of the mode switch** on the AC Hot Stick
- **The magnitude of the AC voltage:** the higher the voltage the earlier the warning.
- **The size of the area which carries voltages:** a vehicle on AC potential will be noticed earlier than the exposed blades of an AC outlet where conduit and outlet box are metal enclosures and grounded.
- **The distance of the source and/or AC Hot Stick from shielding surfaces:** free hanging wires and the AC Hot Stick held above the ground will yield a greater distance than if wire and/or AC Hot Stick are on wet soil or covered by wet leaves.

See **specifications** (*below*) for typical detection ranges

EMERGENCY

This unit is meant for professional use only. It is an aid in detecting unshielded, live wires and dangerous AC potentials. It is not a substitute for voltage measuring devices. Treat all wires as if they are voltage carrying. The unit will not detect DC voltages or AC voltages when conductors are fully enclosed and shielded as in a grounded metal conduit or solid metal enclosures.

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Specifications

Sensitivity, externally switchable:

3 settings

Detection Range:

the detection range or sensitivity is defined as the distance between the AC Hot Stick and the wire conductor with the AC Hot Stick positioned for maximum indication. Signal "*detection* " shall be defined as a beeping rate of at least one indication every 2 seconds. Typical Detection Distance in meters /(*feet*).

Typical Detection Distance in meters /(*feet*):

Voltage	Frequency	Setup	Mode Switch Setting		
			High Sensitivity	Low Sensitivity	Focused Setting
120 VAC 220 VAC	60 Hz 50 Hz	Single conductor (*6′ above ground*)	4.6m (*15′*)	0.9m (*3′*)	150mm (*0.5′*)
120 VAC 220 VAC	60 Hz 50 Hz	Conductor laying on wet soil	0.9m (*3′*)	150mm (*0.5′*)	25mm (*0.1′*)
7.2 kV 16 kV	60 Hz 50 Hz	Overhead distribution line (*single insulator*)	65m (*210′*)	21m (*70′*)	6m (*20′*)
46 kV	60 Hz	Overhead transmission line (*several insulators*)	>150m (*>500′*)	>60m (*>200′*)	>20m (>70′)

Signal Indication

- audible (*beep*) and visual (*LED*)
- beep rate will increase (*or decrease*)

Frequency Range

C voltages 20 Hz to 100 Hz

Self-Test:

built-in, 3-second self-test after turn-on.

Insulation:

PVC plastic housing. (*Note: Direct contact with high tension wires should be avoided*)

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Safety:
Designed for intrinsically safe operation

Batteries:
4× AA alkaline batteries, NEDA 15A, Duracell MN1500 or equivalent

Battery Life:
continuous use: 300 hours, typical use: 1 year

Battery Check:
built-in low voltage warning

Battery Change:
requires removal of lanyard

Water Resistance:
splashwater-proof

Temperature Range:
Operating:
−30 to +50°C (*−22 to +122°F*)
Storage & transport:
−40 to +70°C (*−40 to +158°F*)

Size:
45 mm (*1 3/4″*) diameter × 521 mm (20 1/2 ″) long

Weight, including batteries:
570 grams (*1 lb. 4 oz.*)

Shipping weight:
910 grams (*2 lbs.*)

Ordering information

AC Hot Stick BN 9005/02
includes padded pouch and 4× AA alkaline batteries (*installed*)

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