

WATCHMAN[®]

AREA VOLTAGE DETECTOR

Featuring WAVi[®] Voltage Indication Technology

Operating & Instruction Manual



Making the Invisible Visible[®]

HDE[®] HD ELECTRIC COMPANY
A Textron Company



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GENERAL DESCRIPTION

The Watchman Work Area Voltage Detector uses WAVi® voltage indication technology to detect strong electric fields surrounding high voltage conductors and power distribution equipment. It is typically placed in the vicinity of power lines or high voltage equipment. The Watchman provides an extra level of safety for trained personnel working on or near high voltage systems.



POINTS TO UNDERSTAND BEFORE PROCEEDING

The Watchman Area Voltage Detector detects electric fields. Make sure you understand these points before proceeding:

- Electric fields surround every energized AC conductor.
- The closer you are to a conductor, the stronger the field will be.
- Higher voltage means a stronger electric field and a greater warning distance. Lower voltage means a reduced warning distance.
- Electric fields are NOT blocked by plastics, dry wood or clothing.
- Electric fields ARE blocked by ANY conductor such as a metal cabinet or door, wet wood, metal fences, green trees, a growing shrub or hedge and tall wet grass.
- The detector will not find cables buried under the ground. The ground is a conductor and will block electric fields.
- Insulation on a wire does not block the electric field and does not affect warning distances.
- Underground primary cables are both insulated AND shielded. The shield is a conductor, is grounded, and will block the electric field.
- Molded cable terminators such as elbows are, like the cables they are installed on, both insulated and shielded and will block electric fields.
- Your body will block electric fields. Placing yourself between a high voltage source and the Watchman Detector may prevent it from detecting the high voltage.
- Do not use the Watchman Detector while holding it in your hand. Wrapping your fingers around the Detector will block electric fields, preventing it from working properly.

SAFETY

- Always use proper high voltage procedures, including personal protective equipment, when working near or around high voltage equipment or conductors.
- Do not rely on the Detector as your sole source of high voltage detection. Risk of electrocution is inherent in or around high voltage.
- Always use proper high voltage procedures for testing and grounding.
- Grounded equipment can appear to be live in close proximity to energized conductors.

WARNING



NOT FOR USE BELOW 2400 VOLTS AC.

OPERATIONAL IMPAIRMENT

If the Detector is used in a manner not described in this instruction manual, the protection and effective operation of this equipment may be impaired.

The Detector will not detect DC voltage or stored charge such as in charged capacitors or underground cable. Always use proper high voltage procedures, including personal protective equipment, when working near or around high voltage equipment or conductors. Always use proper high voltage procedures for testing and grounding. Do not rely on the Watchman Area Voltage Detector as your sole source of high voltage detection. Risk of electrocution is inherent in or around high voltage.

HOW IT WORKS

The Watchman Area Voltage Detector works by sensing the presence of the electric field surrounding anything that conducts high voltage electricity.

Spinning lights indicate an electric field and nearby energized conductor. The Watchman Detector has a power and self-test button on the top of the unit to verify battery power and proper functioning of the device. The short flashing lights "heartbeat" indicate that the Watchman Detector is on, checking for the presence of high voltage electric fields.

For more information, refer to the A Word About Electric Fields section on page 7.

HOW TO USE IT

The Watchman Area Voltage Detector should be placed in the vicinity of high voltage conductors that are either energized or could possibly become energized for the purpose of warning those in the vicinity of the presence of high voltage. Refer to the charts starting on page 9 for determining the appropriate placement distances.

The Watchman Area Voltage Detector can be placed as described in these examples:

1. The Watchman Detector can be placed on the ground. The Detector will detect energized high voltage conductors on all sides and above it. Refer to the charts starting on page 9 for determining the detection range and appropriate placement distances.
2. The Detector can be placed on top of a typical traffic cone using the available accessory cone bracket. When a Watchman Detector is placed on a branded green traffic cone, overall visibility is improved and the Detector is positioned for best visibility.
3. The Watchman Detector can be applied to a fence or other similar structure using the accessory hanger bracket. When applied to a metal fence the Detector will only detect conductors on the side of the fence it is hanging from.
4. The Detector can be applied directly to a bare or insulated overhead conductor up to 35kV using this same accessory hanger bracket. In this application the Detector will provide a direct indication of the presence of voltage on either the conductor to which it is applied or on other nearby conductors.

WHEN TO USE IT

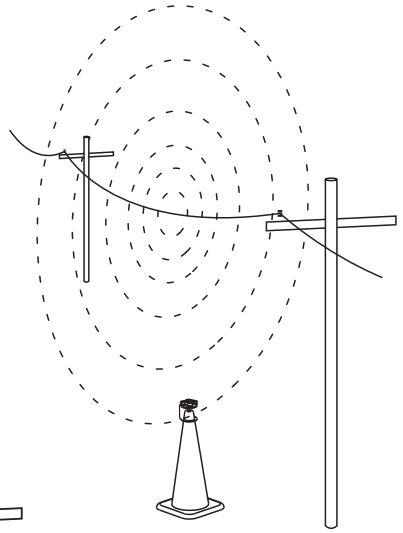
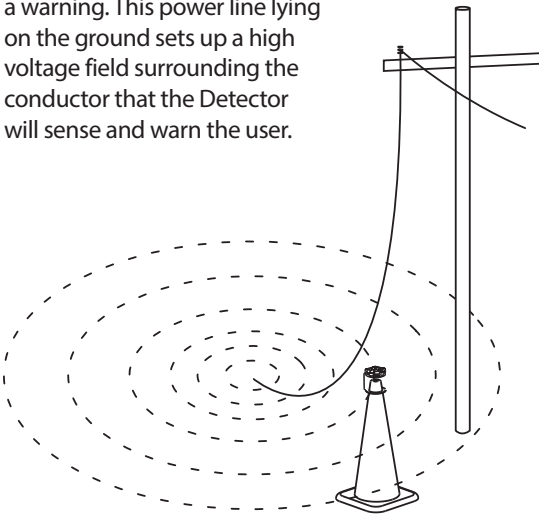
The Watchman Area Voltage Detector can be used anytime, anyplace and for any reason. The decision of when to use the Detector is made by the user and by your company's safety and work practices. When used properly, the Detector can provide an additional warning to users exposed or working around energized high voltage electricity and equipment. Awareness of the presence of a high voltage electric field allows the user to take additional precautions against accidental contact with energized equipment.

The Watchman Area Voltage Detector provides an early warning of the proximity of potentially hazardous high voltage electricity and equipment. The Detector lights will spin when an electric field is detected and will continue to spin for as long as the electric field is present.

A WORD ABOUT ELECTRIC FIELDS

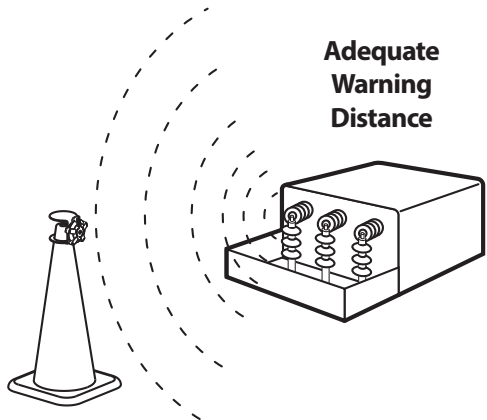
Electric fields surround every energized conductor. The Watchman Area Voltage Detector measures the strength of these electric fields to warn the user when fields are strong enough to indicate the presence of nearby high voltage conductors.

A downed power line is a typical hazardous situation where the Detector can provide a warning. This power line lying on the ground sets up a high voltage field surrounding the conductor that the Detector will sense and warn the user.



The Detector measures the electrical fields typically found in close proximity to energized distribution power lines. Positioning of the detector and its location relative to the voltage source can have a large effect on its sensitivity to electric fields.

The Watchman Detector detects voltages above it and on all sides. The cone mount conveniently places the Detector for best visibility. The Detector can be mounted on the top of this bracket for best sensitivity above and to the sides. It can also be mounted on the side of this bracket for best detecting conductors in one direction. Typical detection distance is 10 feet from a 7kV conductor.

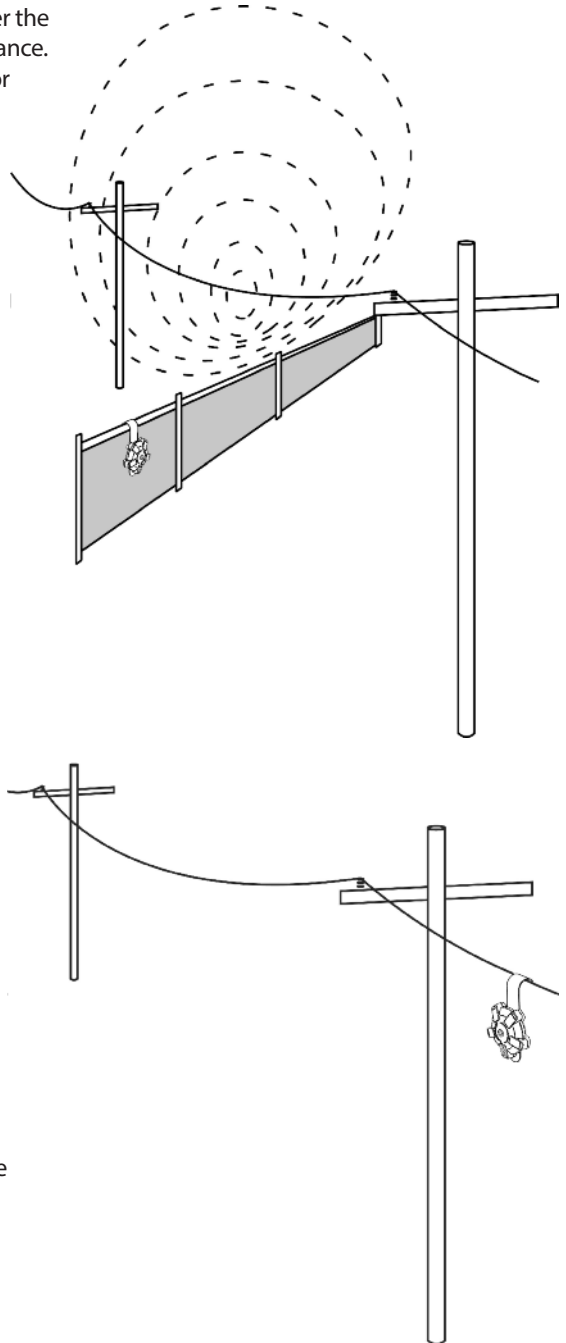


The Watchman Area Voltage Detector measures only the strength of the electric field. It cannot directly measure distance to the source of the electric field such as an energized conductor. The higher the voltage, the stronger the field and the greater the alarm distance. The reverse is also true; the detector may alarm due to the very close proximity of low voltage such as from a computer terminal or a desk lamp. It may even alarm if it is placed up against a typical 120 volt wall outlet.

Electrically conductive objects located underneath power lines can appear to be live. A metal fence or a growing hedge can cause a distortion of the electric field under these lines and result in high electric field strength near the ground. The Watchman Area Voltage Detector will provide an early warning of high electric fields, but not all fields are directly caused by nearby energized objects. To prevent the Detector from issuing too many false alarms, it should not be used in typical office or factory environments where all the equipment is low voltage and there is no danger of contacting energized high voltage conductors.

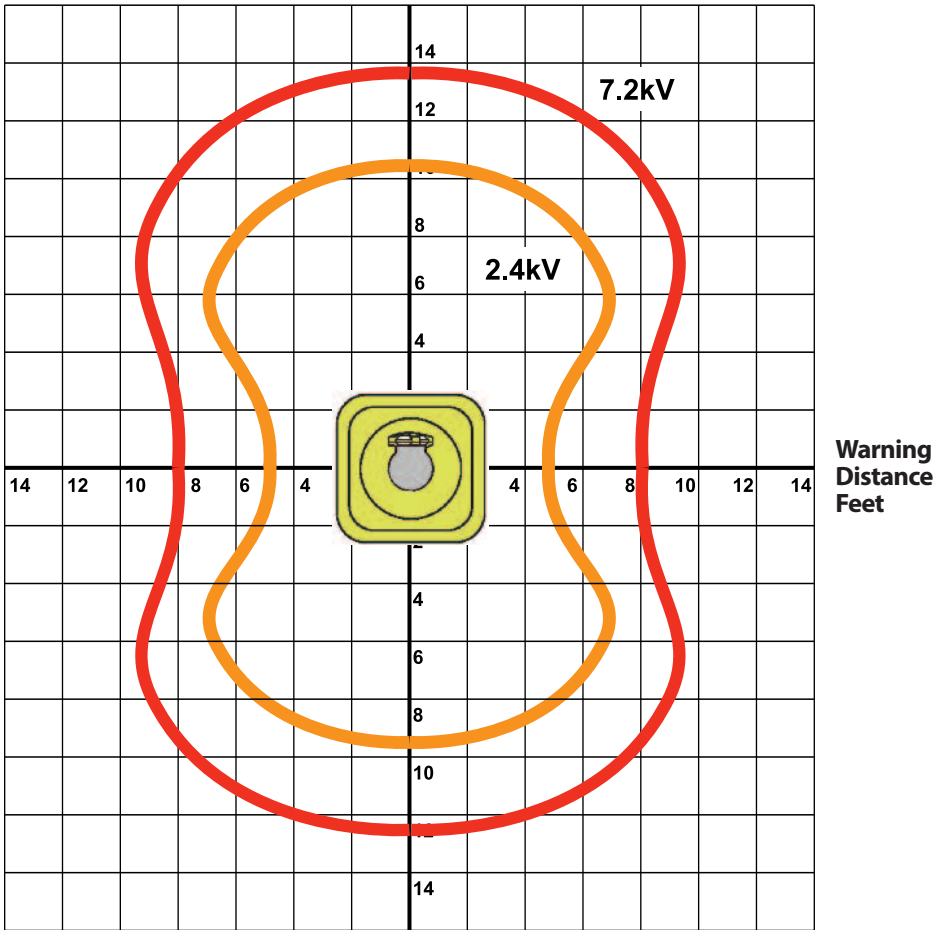
Conductors of different phases in close proximity will also reduce warning distances due to field cancellation effects.

Placing the Watchman Area Voltage Detector in environments such as substations or under transmission lines may result in continuous voltage indication.



WARNING DISTANCE CHARTS

Watchman Detector on Side of Cone Bracket



Each grid square is two feet.

Test conductor is 1 inch diameter bar, three ft. long, three ft. above the ground.

Lines show detection distance at line to ground voltages.



WARNING: Treat all conductors as live unless or until there is a visible break from a live source and a ground is in place.

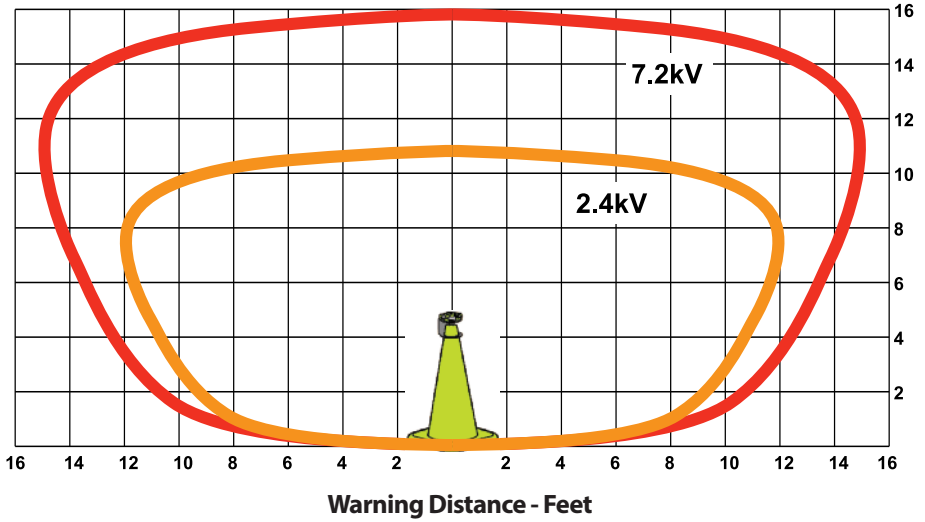


Be aware of unique conditions that may be present around three phase delta systems. Unlike grounded Y systems, a single phase of a delta system can become grounded without causing an outage and the delta system can continue to operate with this grounded phase. If this phase is grounded as a result of a downed conductor or other storm damage, it may be grounded only temporarily and could become reenergized if moved or disturbed. **The Watchman Area Voltage Detector will not detect any grounded conductor, whether it is a grounded delta phase conductor, a guy wire or a pole ground.**

WARNING DISTANCE CHARTS

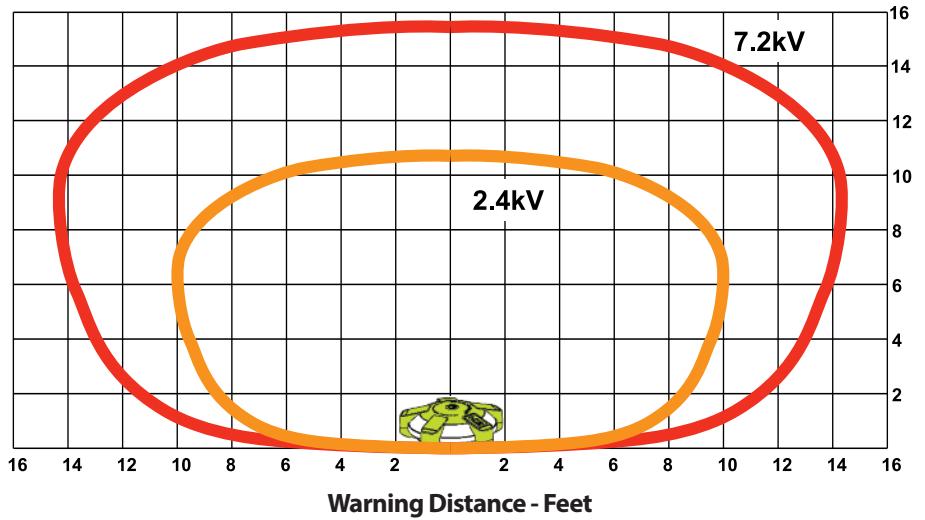
Watchman Detector on Top of Cone Bracket

Conductor Height



Watchman Detector on the Ground

Conductor Height



Each grid square is two feet.
Test conductor is 1 inch diameter bar.
Lines show detection distance at line to ground voltages.



NOT FOR USE BELOW 2400 VOLTS AC.

Before using, read the instruction manual and review product labeling.

Make certain that the Detector is equipped with 3 AAA batteries. Press the Power / Self Test button on the top of the Detector to turn it on and verify spinning lights before and after each use. The test circuitry generates an internal voltage which the Detector then detects by turning on the lights. DO NOT USE the Watchman Area Voltage Detector if the On/Test button fails to activate the lights. Remove from service and contact the factory to arrange for repair.



CAUTION – Press and hold the On/Test button before and after each use to ensure proper operation.

The detector will show spinning lights when it detects high voltage. For more details, refer to the Warning Distance Charts starting on page 9.

WATCHMAN™		HDE <small>HD ELECTRIC COMPANY A Teleton Company</small>
Work Area Voltage Indicator		
<p>Read instructions before use. To power on and self-test this unit, hold button for a few seconds. If the chasing lights do not turn on, or do not remain on while button is held, the batteries are low and must be replaced. While on, an intermittent "heartbeat" flash will be visible. If the heartbeat stops, batteries must be replaced. Unit may be magnetically fixed to certain metal surfaces, or other objects using separate accessories. Do not hold this device while in use. Use extreme caution during use as high voltage may be nearby. Three (3) AAA batteries needed for operation.</p>		
	CAUTION: Strong Magnets. Keep away from credit cards, hard drives, and magnetic strips.	
	WARNING: Do not rely on this device as your only indication of high voltage.	
	DANGER: Chasing lights indicate proximity to high voltage and associated risks of arcing and electrocution.	
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BATTERY REPLACEMENT

The Watchman Area Voltage Detector will indicate if it has low batteries. When the batteries get low the Detector stops the heartbeat lights. The Detector will continue to detect voltage until the remaining battery life is exhausted, in about 4 hours.

To replace the batteries, access the batteries through the door on the bottom. A coin may be required to open the battery compartment door. Remove and dispose of the old batteries, replacing them with a fresh, new set of AAA alkaline or lithium batteries. Be sure to connect the proper battery polarity and replace the cover. Press and hold the On button to confirm proper operation. If after changing the batteries the On button fails to confirm proper operation, DO NOT USE the Watchman Area Voltage Detector. Remove it from service and contact the factory to arrange for repair.

CLEANING

To clean, wipe with a damp cloth with water. Do not use harsh chemicals or solvents.

TECHNICAL SPECIFICATIONS

MODEL NUMBER: WM-01

SENSITIVITY: Factory set at 50/60Hz sensing threshold. The Detector will only detect AC voltage. Do not use below 2400 Volts.

TYPICAL WARNING DISTANCE: 7 feet (2.13m) from a 4kV AC conductor. For more details, refer to the Warning Distance Charts starting on page 9.

OPERATING FREQUENCY: 50Hz/60Hz

BATTERIES: AAA ANSI 24A, IEC LR03 or AAA lithium ANSI 24-LF, IEC-FR03. Life 2 years in storage, 1,000 hours standby heartbeat mode, 10 hours continuous voltage indication.

WEIGHT WITH BATTERY: 8 oz. (227g.)

DIMENSIONS: 3.8 in. (9.7cm.) diameter x 1.4 in. (3.6cm.) high

VOLTAGE RANGE: 2400VAC and above

ENCLOSURE MATERIAL: ABS UL 94-HB

PRINTED CIRCUIT BOARDS: FR-4 UL94V-0

INGRESS PROTECTION: IP67

ENVIRONMENTAL CONDITIONS

CONDITIONS: Indoor and outdoor use, IP67

ALTITUDE: Up to 6,566 ft. (2000M)

OPERATING TEMPERATURE: -20°F to +140°F (-29°C to +60°C)

HUMIDITY: 95% to 60°C (non-condensing)

OVERVOLTAGE CATEGORY: II Non-contact

POLLUTION DEGREE: PD4

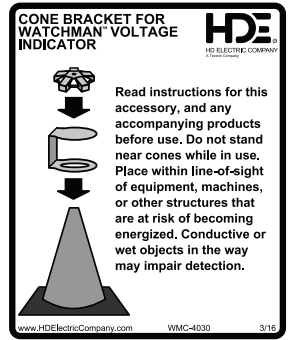
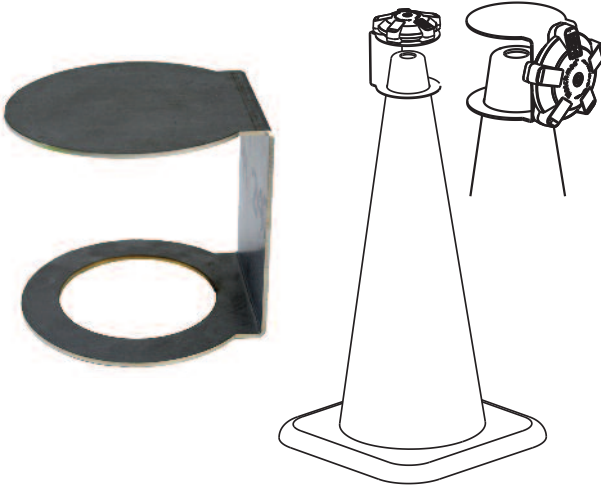
MANUFACTURING LOCATION

HD Electric Company • Waukegan, IL. 60085, USA

ACCESSORIES

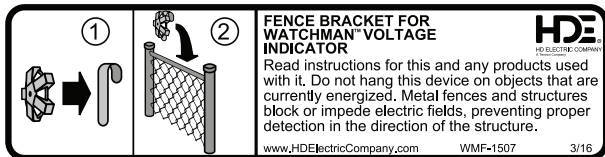
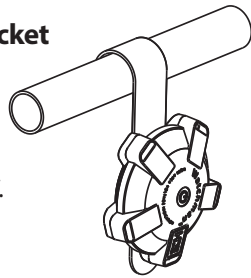
WM-CB1 Cone Mount Bracket

The WM-CB1 Cone Mount Bracket accessory allows the Watchman Detector to be placed on a safety cone above the ground for better visibility and sensitivity to overhead conductors. Use the Detector mounted on the top of this bracket for best sensitivity above and to the sides. The Detector can also be mounted on the side of this bracket for best detecting conductors in the direction facing the Watchman Area Voltage Detector.



WM-FB1 Fence Mount Bracket

Used on fences or any railing to provide a warning that the conductor may be energized. May also be attached to overhead conductors up to 35kV.





WM-BGL Storage Bag

Large storage bag; holds 12 Watchman Detectors and accessory brackets.



WM-BGS Storage Bag

Small storage bag; holds 6 Watchman Detectors and accessory brackets.

LIMITED WARRANTY AND LIMITATION OF LIABILITY

This warranty applies to all products sold by HD Electric Company (the "Products"); provided, however, that the term Products does not include any third party products purchased through HD Electric Company, for which no warranties are made (the "Third Party Products"). Third Party Products may be subject to a separate manufacturer's warranty; [should you have any question regarding whether a separate warranty applies, please contact HD Electric Company].

NOTICE: READ THIS LIMITATION OF WARRANTY AND LIABILITY BEFORE BUYING OR USING THE PRODUCTS CONTAINED HEREIN.

It is impossible to eliminate all risks associated with the use of the Products. Risks of serious injury or death, including risks associated with electrocution, arcing and thermal burns, are inherent in work in and around energized electrical systems. Such risks arise from the wide variety of electrical systems and equipment to which Products may be applied, the manner of use or application, weather and environmental conditions or other unknown factors, all of which are beyond the control of HD Electric Company.

HD Electric Company does not agree to be an insurer of these risks, and shall have no liability for any claims arising from such risks.

WHEN YOU BUY OR USE THESE PRODUCTS, YOU AGREE TO ACCEPT THESE RISKS.

HD Electric Company warrants to the original purchaser that the Products (excluding any third party products purchased through HD Electric Company, for which no warranties are made) will be free from defects in material and workmanship, under normal use and regular service, and preventative maintenance for a period of one (1) year (ten (10) years for HDE Capacitor Controls) from the date of shipment (the "Warranty Period"). Should any failure to conform with this warranty be found during the Warranty Period, you must notify HD Electric Company of your claim within thirty (30) days of discovery, and within the Warranty Period. Your failure to give notice of claims of breach of warranty within the Warranty Period shall be deemed an absolute and unconditional waiver of claims for such defects. HD Electric Company will have no responsibility to honor claims received after the date the applicable Warranty Period expires.

Upon notice of your claim, HD Electric Company will provide a return authorization number, and further instructions on how to return the product for service. You must follow HD Electric Company's instruction. You are responsible for all Product removal, handling, re-installation, and shipping (both to and from HD Electric Company). Products returned for repair, as well as repaired or replacement Products shall be sent postage / freight prepaid. After receipt of a product which HD Electric Company determines is defective, HD Electric will, at its option, either (1) repair (or authorize the repair of) the Product or (2) replace the Product, subject to the following: The Products are made using parts sourced from a variety of manufacturers. Due to the rapidly changing technology environment, parts may become obsolete / unavailable over time (end of life). In the event that a Product cannot be repaired or replaced due to unavailability of parts, HD Electric Company will use commercially reasonable efforts to obtain substitute parts or conduct work around design, but cannot guarantee its ability to do so.

Items not found defective will be returned at your expense, or failing receipt of instruction from you on return of such items within five (5) business days of our notice to you that the product is not defective, HD Electric may dispose of the product at its discretion and with no liability to you. HD Electric Company's determination of defects is final. Products repaired or replaced during the Warranty Period shall be covered by the foregoing warranties for the remainder of the original Warranty Period or ninety (90) days from the date of delivery of the repaired or replaced Products, whichever is longer.

LIMITATIONS:

This warranty is void in the event of misuse, alteration, faulty installation, or misapplication of the product.

This warranty does not cover failure of product or components due to any ACT OF NATURE; lightning, floods, hurricanes, tornadoes or any other such catastrophic events.

HD Electric Company does not warrant any third party products or associated hardware or their performance or suitability for use and application. Such items are provided "as-is".

All repairs must be authorized by HD Electric Company. Unauthorized repairs will not be reimbursed under any circumstances.

HD Electric Company is not required to make replacement or loaner equipment available while Products are being repaired or replaced, or to compensate you for any in/out labor charges or expenses associated with removal, handling or re-installation of the Products.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. HD ELECTRIC EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY AND NON-INFRINGEMENT.

IN NO EVENT SHALL HD ELECTRIC COMPANY BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THESE PRODUCTS. THIS SHALL INCLUDE BUT, NOT LIMITED TO, LOST PROFITS OR REVENUE, LOSS OF USE OF THE PRODUCTS, COST OF SUBSTITUTE PRODUCTS, FACILITIES OR SERVICES, OR DOWNTIME.

IN NO EVENT SHALL HD ELECTRIC COMPANY HAVE ANY LIABILITY FOR ANY THIRD PARTY PRODUCTS OR ASSOCIATED HARDWARE, OR CUSTOMER-OWNED SYSTEMS, EQUIPMENT OR SOFTWARE.

HD Electric Company must have prompt notice of any claim so that an immediate product inspection and investigation can be made. Buyer and all users shall promptly notify HD Electric Company of any claims, whether based on contract, negligence, strict liability, or other tort or otherwise be barred from any remedy.

HD Electric Company is committed to ongoing review and improvement of its product lines, and thus reserves the right to modify product design and specifications without notice.

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