INSTRUCTION MANUAL

HDE GREENLEE®

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TAG-200X & TAG-200XMR Voltage Detectors

Read and **understand** all of the instructions and safety information in this manual before operating or servicing this tool.

KEEP THIS MANUAL

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KEEP THIS MANUAL

Safety Symbols Key

In this operator's manual and on the product, safety symbols and signal words are used to communicate important safety information. This section is provided to improve understanding of these signal words and symbols.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER

indicates a hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠WARNING

indicates a hazardous situation which, if not avoided, COULD result in death or serious injury.

⚠CAUTION

indicates hazards or unsafe practices which, if not avoided, MAY result in injury or property damage.

	This symbol means read the instruction manual carefully before using the equipment. The operator's manual contains important information on the safe and proper operation of the equipment.
	This symbol means always wear safety glasses with side shields or goggles when handling or using this equipment to reduce the risk of eye injury.
	This symbol means to always wear gloves when using this equipment to reduce the risk of injury.
	This symbol indicates the risk of arc flash.
	This symbol indicates the risk of electrical shock.

Tool Specific Safety Information

⚠DANGER

Safety is essential in the use and maintenance of Greenlee tools and equipment. This instruction manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all the safety information provided in this manual.

Before operating this tool, read and understand:

- This operator's manual
- The instructions for any other equipment or material used with this tool
- Markings on the tool
- Required worksite safety procedures

Failure to follow all instructions and warnings may result in serious injury or death.

- **Only a person trained in working around and on high voltage electric systems should use this tool.** The voltages these instruments operate around are to be considered live and dangerous and are lethal. Severe injury or death can occur if improperly used.
- **Always follow proper high voltage procedures, including use of personal protective equipment, when working near or around high voltage equipment or conductors.**
- **Always use hot sticks when using this tool.** Follow rigorous hot stick work practices to reduce the risk of injury or death from electric shock or arc flash.
- **Do not touch any part of the detector while it is in contact with high voltage.** The tool should be considered as at the same voltage as the conductor under test. Maintain proper high voltage work clearances.
- **Do not let familiarity gained from frequent use of these tools allow you to become complacent and ignore tool and work site safety principles.** A careless action can cause severe injury or death within a fraction of a second.
- **Use this tool for the manufacturer's intended purpose only.** Use other than what is instructed in this manual could result in a hazardous situation.
- **Use the correct accessories for your application.** Use of the wrong or underrated accessories increases the risk of injury and tool damage.
- **Stay alert, watch what you are doing and use common sense when using this tool.** Do not use tool while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention could result in serious injury or death.
- **Do not allow another high voltage conductor, or grounded point to contact the tool housing during use.** Keep the housing clear of all conductors. Always maintain proper high voltage work clearances.
- **Do not use the detector at voltages outside of its designed range.** Testing outside of the specified range will result in a false reading or no reading at all and could lead to a hazardous situation. Consult the product label for the specific ranges for the unit supplied.
- **Confirm proper operation before and after each use to reduce the risk of injury due to false readings.** False readings could lead to a hazardous situation and increases the risk of severe injury or death.
- **Do not overreach.** Always keep proper footing and balance, this enables better control of the tool in unexpected situations.
- **Keep tools clean and in good condition**. A dirty or damaged tool increases the risk of false readings and increases the risk of electrical shock.

Tool Description & Features

The TAG-200X and TAG-200XMR Voltage Detectors are designed to detect line voltage on distribution lines within a range of operating voltages.

The TAG-200X Voltage Detector is a single range voltage detector with one range of operating voltages set within the unit.

The TAG-200XMR Voltage Detector is a multi-range voltage detector that can be set for up to three operating voltage levels.

Features

- Higher voltage levels can be set so the level is no more than three times (e.g. 4kV to 12 kV and 35kV) the previous voltage setting.
- Specific voltages are chosen by the customer before delivery for the minimum and maximum ratings of the unit. The on-product markings will show the specific voltage range settings of the unit.
- An audible alarm and red LEDs indicate voltage detection within range of the unit settings.
- The All-Check self-test feature provides a full test of the battery, the electronic circuitry and the audible and visual alarm.
- A universal spline and shotgun connection for hot sticks is built into the polycarbonate housing.

Specifications

Dimensions ..... 10 in. x 2.5 in. x 3.7 in. (25.4 cm x 6.4 cm x 9.4 cm)
Weight ..... 0.86 lb (0.39 kg)
Buzzer Noise Level ..... 103 dB @ 2 ft.

ENVIRONMENTAL CONDITIONS

Operating Temperature ..... 5°F to 120°F (-15°C to 49°C)
Enclosure Material ..... Polycarbonate UL94V-2
Printed Circuit Board FR-4 UL94V-0
Environmental Conditions ..... Indoor and Outdoor use
Humidity ..... 95% to 49°C (non-condensing)

ELECTRICAL SPECIFICATIONS

Minimum Voltage Setting ..... 4kV (2.4kV line-to-ground)
Maximum Voltage Setting ..... 69kV (40kV line-to-ground)
Operating Frequency 50/60Hz
Check on product markings for the specific ranges of the unit.

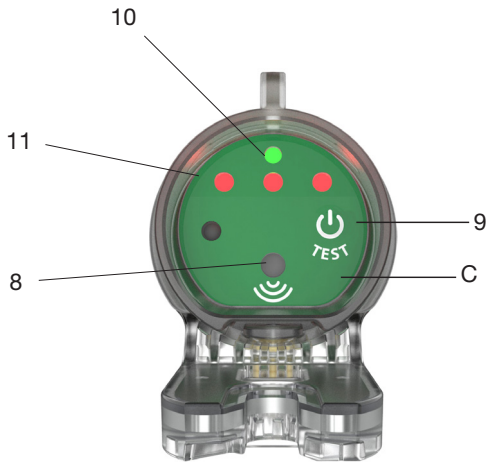
BATTERY

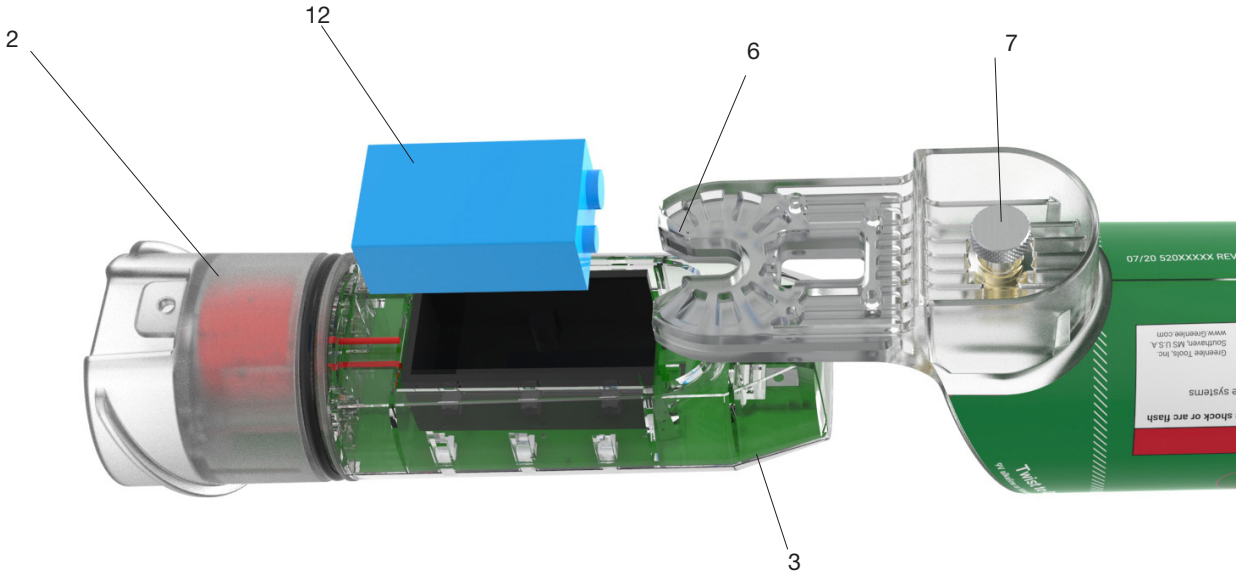
Battery ..... one 9V Alkaline 1604A, IEC 6LR61 or Lithium 9V ANSI-1604LC
Battery Life (Alkaline) ..... 10 hrs. Continuous Operation
Battery Life (Lithium) ..... 16 hrs. Continuous Operation
Battery life with typical usage ..... 1 month

All specifications are nominal and may change as design improvements occur.

Tool Identification

1. Outer Housing
2. Carrier
3. Electronic Sub-Assembly
4. Probe Connection
5. Universal Spline (Hot Stick Attachment)
6. Battery Holder
7. Locking Pin
8. Buzzer
9. Test Button
10. ON / Good Battery LED (Green)
11. Voltage Indicator LEDs (Red)
12. 9V Battery (Alkaline/Lithium)





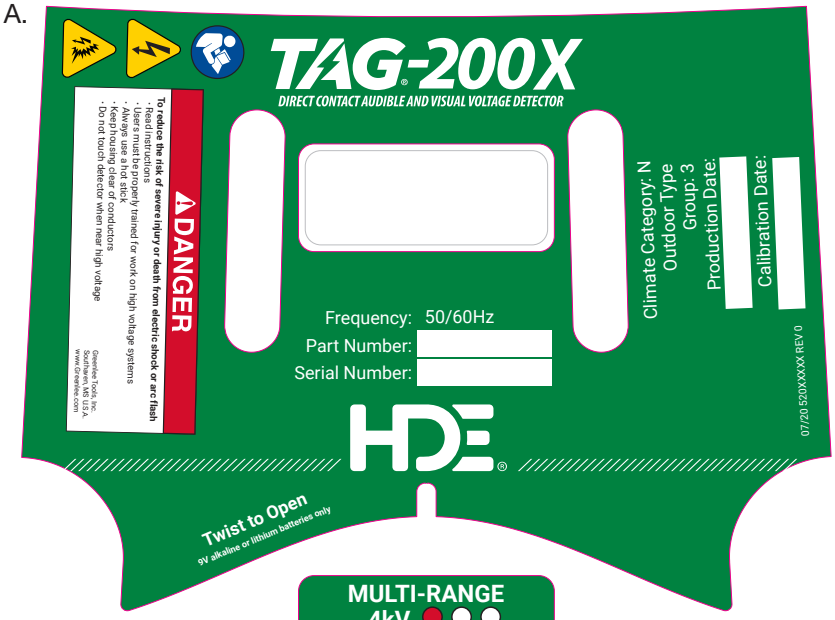
Decals & Locations

A. Safety and Product Information Decal

B. Detector Threshold Decals

C. User Panel Overlay

A.



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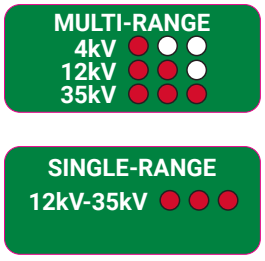

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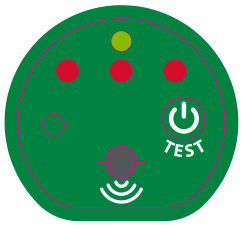


Training & Qualifications

This product is designed for use by professionals trained for working on and around high voltage electrical equipment. If you are not trained in the work methods required for safe operation, do not use this product.

It is recommended at least a second trained and qualified person is present at appropriate distance to respond if needed.

Follow all training and proper jobsite safety precautions outlined by your industry, government and employer. Make certain all other safety considerations have been identified, implemented and are in place prior to using this equipment.

Pre-Operation Inspection & Set-up

⚠DANGER

- **Always use hot sticks when using this tool.** Follow rigorous hot stick work practices to reduce the risk of injury or death from electric shock or arc flash.
- **Use the correct accessories for your application.** Use of the wrong or underrated accessories increases the risk of injury and tool damage.
- **Always follow proper high voltage procedures, including use of personal protective equipment, when working near or around high voltage equipment or conductors.**
- **Confirm proper operation before and after each use to reduce the risk of injury due to false readings.** False readings could lead to a hazardous situation and increases the risk of severe injury or death.

Check for damage and any other condition that may affect the tool's operation. Do not use this product if it is damaged or not working as expected. Remove from service and arrange for repair or replacement before use. Many accidents are caused by poorly maintained tools. A dirty or damaged detector increases the risk of false readings.

1. Check that the detector and probes are clean and dry before using.
2. Check housing and probes for damage such as cracks, distortion in the case or probe and burns.
3. Identify the correct probe for the application and make sure it is screwed firmly in place at the end of the detector. Do not over-tighten. The probe will be more difficult to remove.

For overhead applications use the Y probe:

TAG-200X Overhead Probes

CATALOG #	VISUAL	DESCRIPTION
TAG-42029X		OVERHEAD Y PROBE SMALL, TAG
TAG-41811X		OH STRAIGHT SHORT PROBE, TAG

For underground distribution (UG) and metal-enclosed switchgear, use underground probes. Insert the probe directly into the bushing, keep probe clear of all surrounding surfaces. (See Page 11 - TAG Underground Probes Table)

4. After assembly, test the TAG Voltage Detector by using the Self-Test function.
   Do not perform the All-Check Self-Test if the TAG Detector is in contact with a voltage source.

   Self-Test

   i. Hold detector securely, looking at the User Panel.

   ii. Push and hold the TEST button. The red LEDs will flash and the buzzer will sound.

   iii. After releasing the TEST Button, a successful test will show the green LED remaining ON while the red LEDs and buzzer turing OFF. *The green LED will stay ON for approximately three (3) minutes following the most recent activity and will turn Off if the device remains idle.*

   If holding the test button does not cause the red and green LEDs to light and the buzzer to sound, check the battery and change if necessary. Repeat the Self-Test.

   If the unit still doesn't show the actions described above, remove the unit from service and send it for repair. Do not use the detector if it does not pass the Self-Test.

5. After confirming completion of the self-test, continue to hold the detector using the spline or hot stick to test the fully assembled TAG Voltage Detector on a known voltage source, such as the PT-DET Proof Tester Voltage Detector Tester, before using the detector on an unknown voltage source.

6. Securely attach the detector to the appropriate hot stick, if it is not already attached, using the built-in universal spline. Company, government and industry hot stick safety procedures must be followed at all times.

If any issues are found, do not use this tool until fixed.

Tool Operation

⚠DANGER

- **Do not touch any part of the tool while it is in contact with high voltage.** The tool should be considered as at the same voltage as the conductor under test.
- **Do not allow another high voltage conductor, or grounded point to contact the tool housing during use.** Keep the housing clear of all conductors. Always maintain proper high voltage work clearances.
- **Do not use the detector on voltages outside of its designed range.** Testing outside of the specified range will result in a false reading or no reading at all and could lead to a hazardous situation. Consult the product label for the specific ranges for the unit supplied.
- **Do not overreach.** Always keep proper footing and balance, this enables better control of the tool in unexpected situations.

1. Inspect job site and confirm you have the right tools for the job. Avoid these situations where false readings may occur.
   - 90° CORNER CONFIGURATIONS: Conductor configurations, busbar and other electrical apparatus all apply. Reposition the TAG Detector to at least 3 feet (1 m) on both sides of the 90° corner configuration and attempt to retest.
   - SAME PHASE INTERFERENCE: When two conductors of the same phase are close to each another, the field generated could shield the TAG Detector, causing it not to operate. Reposition the TAG Detector to areas outside of this field.
   - OPPOSITE PHASE INTERFERENCE: This condition may occur if you are testing a grounded and de-energized conductor which is close to a live, ungrounded conductor. When applying the TAG Detector, attempt to approach the conductor you want to test from outside this possible field. If you are within the field of the energized conductor, the TAG Detector may indicate that the de-energized line is energized due to induced current.

   Choose where on the conductor the detector will be used avoiding the previously mentioned situations.
2. Place the TAG Detector in direct metal-to-metal contact with the conductor being tested for voltage. The TAG Voltage Detector should be positioned as close to a 90° orientation (perpendicular) to the conductor as possible.
   - If the conductor is energized within the range of the detector, there will be both an audible sound and the red lights will turn On.
   - If the conductor is not energized no red lights will show, the green LED from the Self-Test may still be on if it is within 3 minutes from the Self-Test.
   - The TAG will not give an alarm due to induced voltage on de-energized conductors, unless the induced voltage level exceeds the threshold voltage of the detector.
3. Repeat the Self-Test. If the unit doesn't pass the Self-Test after testing the line, remove the unit from service and send it for repair. Do not assume the test results from that TAG Voltage Detector are correct. Retest the conductor with a different TAG Voltage Detector.

PT-DET Proof Tester

⚠WARNING

- **Do not touch the testing surface to reduce the risk of electric shock.**
- **Do not use this tester except as directed to reduce the risk of injury.**
- **Do not apply to energized circuits or equipment.** This tester could cause a short and cause injury.
- **Do not operate this tester if housing is cracked or without the battery cover to reduce the risk of injury.**
- **Do not attempt to open the tool except to change the battery.** It contains no user-serviceable parts.

The PT-DET Proof Tester Voltage Detector Tester (Fig. 1) generates a high voltage AC for testing theTAG-200X and TAG-200XMR Voltage Detectors only, up to and including 69kV.

1. Hold the Tester in one hand and the TAG Detector in the other hand by the spline or hot stick.
2. While touching the TAG Detector probe to the metal end plate on the Tester, press and hold the TEST button on the Tester. A properly operating TAG Detector will signal the presence of voltage with both a beeper and flashing lights.

   If the Tester or Detector lights do not light, replace the battery with a 9V lithium or alkaline type battery of the unresponsive unit and try again.

Figure 1

Storage

It is recommended to store the TAG-200X and its accessories in the carrying case provided. If a prolonged period of storage is anticipated (six or more months), remove the battery. Replace with a new battery prior to using the TAG-200X again after a long time in storage.

Maintenance

⚠WARNING

- **Do not perform any maintenance other than as described in this manual.** Personal injury or damage to the tool may result.
- **Do not modify this tool.** Modifying the tool in any manner may result in personal injury and damage to the tool.
- **Do not attempt to open the tool except to change the battery.** It contains no user-serviceable parts

Cleaning

Use a silicone impregnated cloth to clean housing prior to use in order to maintain the surface.

Changing the Battery

Batteries should be changed on a regular schedule, and it is recommended the battery be changed every 6 months.

1. Pull out and rotate the locking pin 90 degrees to lock it in the “out” position. (Fig. 2)
2. Withdraw the electronic sub-assembly by pulling down on the carrier.
3. Remove the existing battery and replace it with a fresh 9V battery. When inserting battery into housing, make certain that the polarity is correct. (Fig. 3)

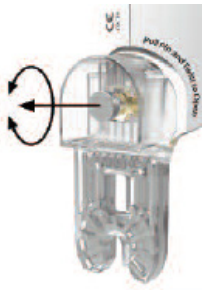


Figure 2

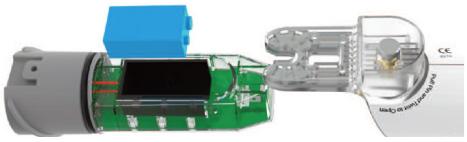


Figure 3

4. Push the electronic sub-assembly back into the outer housing. Turn the locking pin until it snaps back into a “closed” position to secure the assembly.

Service

⚠WARNING

- **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury.
- **When servicing a tool, use only identical replacement parts.** Use of unauthorized parts or failure to follow maintenance instructions may create a risk of electric shock or injury.

Every twelve months the TAG Voltage Detector should be sent for inspection, cleaning, and function evaluation.

If needed, the unit will be recalibrated. This should be done at a factory trained repair facility, the HDE factory, or other qualified location.

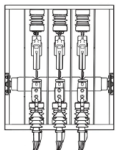
If any repairs are required before recommended service, contact Greenlee's Customer Service.

Disposal

Parts of these tools contain valuable materials and can be recycled. There are companies that specialize in recycling that may be found locally. Dispose of the components in compliance with all applicable regulations. Contact your local waste management authority for more information.

For EU Countries: Do not dispose of electrical equipment with household waste! According to the European Guideline 2012/19/EU for Waste Electrical and Electronic Equipment and its implementation into national legislation, electrical equipment that is no longer usable must be collected separately and disposed of in an environmentally correct manner.

TAG Underground Probes

P/N	CATALOG #	DESCRIPTION
IEP-UD/C		PROBE FOR 15KV AND 25kV LOADBREAK BUSHINGS. 
IEP-EA/C		PROBE FOR 15KV AND 25KV LOADBREAK ELBOWS 
IEP-EA/C-35		PROBE FOR LARGE INTERFACE 35KV LOADBREAK ELBOWS. 
IEP-TAG-EXT		EXTENSION PROBE FOR DIRECT CONTACT WITH BARE LIVEFRONT SWITCHGEAR 
ASP-15/25 with IEP-UDP		PROBE FOR 15KV AND 25KV LOADBREAK BUSHINGS. REQUIRES IEP-UDP ADDAPTER TO USE.