



Auto-Ranging Voltage Indicator Operating Instructions

C4033374 (600 V - 69 kV)

C4033375 (69 kV - 500 kV)



NOTICE: Before operating a CHANCE® Voltage Indicator, thoroughly read, understand, and follow these instructions. Keep these instructions with product for future reference.

These instructions do not claim to cover all details or variations in equipment, nor to provide for all possible conditions to be met concerning installation, operation, or maintenance of this equipment. If further information is desired or if particular problems are encountered which are not sufficiently covered in this guide, contact Hubbell Power Systems.



Hubbell has a policy of continuous product improvement.
Please visit hubbellpowersystems.com to confirm current design specifications.



Guide to Warnings within Manual

The following is a list of warnings used within this manual and should be read in their entirety to ensure safe practices.

DANGER

A DANGER refers to operating procedures, techniques, etc., that, if not followed carefully will RESULT IN DEATH.

WARNING

A WARNING refers to operating procedures, techniques, etc., that, if not followed carefully could RESULT IN PROPERTY DAMAGE, INJURIES, AND/OR DEATH.

CAUTION

A CAUTION refers to operating procedures, techniques, etc., that, if not followed carefully could RESULT IN DAMAGE TO EQUIPMENT, LOSS OF SERVICE to customers, AND INJURIES.

NOTICE

A NOTICE refers to information that is considered important but not hazard related.

⚠ WARNING

To prevent serious injury or death:

- ONLY to be used by competent and fully trained professionals following all warnings, regulations, codes, and employer's work practices.
- ALWAYS thoroughly inspect all components and accessories and test before each use.
- NEVER use if modified or damaged.
- ONLY use with CHANCE accessories.

⚠ WARNING

NEVER allow the universal coupling or housing to become grounded in any way, or to contact another phase as this will cause erroneous voltage indication and could cause severe personal injury or damage to equipment.

ALWAYS maintain proper Minimum Approach Distances (MAD).

NEVER consider the length of the Auto-Ranging Voltage Indicator (including the probe, orange tube, display housing, and universal fitting) as insulating for MAD.

⚠ DANGER

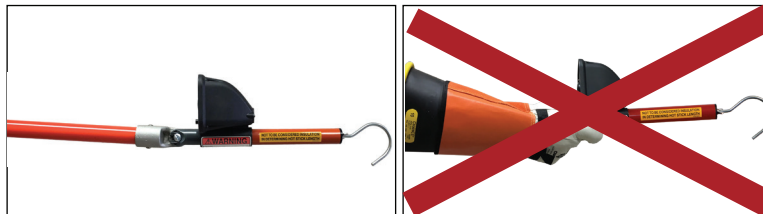
To prevent death: ALWAYS use proper insulating tools and equipment and maintain safe working distances when working on or near energized electrical systems and/or components.

⚠ WARNING

ALWAYS use an appropriate-length insulating Hotstick, even when wearing rubber insulating gloves. Contact with universal coupling or other parts, even with rubber gloves, will affect the reading.

ALWAYS verify function on a known energized primary voltage source or with an appropriate CHANCE Voltage Indicator Tester before and after use. Failure to verify proper function of the indicator could lead to serious injury or death.

NEVER engrave on orange housing tube.



Correct Use

Incorrect Use

Function and Design Overview

The CHANCE® Auto-Ranging Voltage Indicator (ARVI) is a portable tool used to confirm that an AC (Alternating Current) high-voltage circuit is energized or de-energized prior to performing maintenance. Readings from the ARVI represent the class of voltage that is present on the line.

The C4033374 is designed for use on AC voltages from 600 V to 69 kV, 60 Hz. The C4033375 is designed for use on AC voltages from 69 kV to 500 kV, 60 Hz. They are used to confirm the condition of a circuit after principal work procedures are completed to de-energize the circuit. The unit utilizes a single point of contact to the conductor, therefore it is not a voltmeter.

The ARVI is an electric field intensity indicator, which is calibrated to illuminate an LED (light-emitting diode) representing the class of voltage that is present on the conductor. It responds to the magnitude of the field gradient between its end probe and a floating electrode. The device may also indicate the combined field intensity from nearby conductors, including ground wires and grounded equipment. If the universal coupling is too close to a ground, another phase, or another voltage source, the voltage indication will tend to be high. If the universal coupling is too close to a jumper or equipment of the same phase, the indication will tend to be low. **The tool must always be used with an appropriate length Hotstick for safety and to maintain its calibration.**

NOTICE

This device is an AC (alternating current/alternating voltage) only indicator; do not attempt to use it to detect DC (direct current/non-alternating voltage).

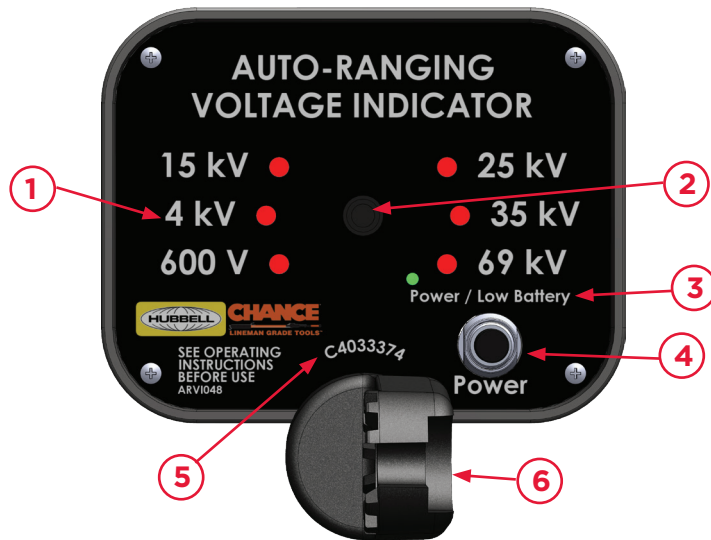
Features

- Meets intent of OSHA 1910.269 to test for absence of nominal voltage
- Used to determine if power lines are at rated voltage, have induced voltage, or are de-energized
- For use on overhead systems with appropriate accessories
- For use on underground systems (C4033374 only) with appropriate accessories
- Power-saving sleep mode (auto-off)
- Audible alarm with visual indication
- Approximate Phase-to-Phase voltage ranges are indicated by LED lights
- Automatic Hold Mode
- Battery drawer for simple battery replacement

Accuracy

This instrument is not a voltmeter; hence, the manufacturer claims no specific accuracy, and therefore, no specific accuracy is to be assumed by the user. Readings will vary with the field intensity, determined by a great variety of field conditions including proximity, size, and orientation of all system components in the vicinity, both energized and grounded. Erroneous readings may result from being too near other energized conductors or being too near another phase or ground. To avoid such field distortions, keep the unit as far away as practical from all system components other than the specific conductor being tested.

Front Panel Information



1. Red Voltage Class LEDs
2. Audible Alarm
3. Green Power / Lower Battery LED
4. On/Off Power Button
5. Model Number
6. Universal Coupling for attachment to Hotstick

Ranges

The approximate phase to phase voltage ranges to provide indication of each voltage class are:

C4033374 ARVI Only

Voltage Class	Voltage Range
600 V	480 V to 900 V
4 kV	1 kV to 6.5 kV
15 kV	6.6 kV to 17 kV
25 kV	18 kV to 29 kV
35 kV	30 kV to 50 kV
69 kV	51 kV to 80 kV
Above 80 kV	Over range (all LEDs illuminate)

C4033375 ARVI Only

Voltage Class	Voltage Range
69 kV	50 kV to 109 kV
115 kV	110 kV to 149 kV
161 kV	150 kV to 199 kV
230 kV	200 kV to 299 kV
345 kV	300 kV to 399 kV
500 kV	400 kV to 765 kV
765 kV	Over range (all LEDs illuminate)

General Operation

To turn the unit on, press and release the “Power” push button. Upon power-up each LED will illuminate individually from the lowest voltage to the highest followed by the audible alarm. These tests verify the function of the LEDs, alarm, batteries, and internal circuitry. Full unit function can only be verified using a known energized voltage source within the indicating range of the ARVI, or with the appropriate Voltage Indicator Tester (C4033409 Voltage Indicator Tester for C4033374 ARVI and C4033431 Voltage Indicator Tester for C4033375 ARVI). Following the audible alarm, the green “Power / Low Battery” LED will flash indicating that the unit is ready for use. After use turn the unit off by holding the power switch until the power LED turns off, or the unit will power itself down after approximately 15 minutes of inactivity.

The unit will begin to make an audible beep and an LED will blink when the unit senses an electric field, even when not making contact with an energized conductor. The higher the voltage, the faster the beeping occurs.

Auto-Hold Mode

The ARVI has a hold feature built into the circuitry, which automatically holds a reading when the unit is left on an energized conductor or senses constant voltage for a period of approximately 15 seconds. In the hold mode, the LED representing the voltage range being indicated will become solid. The audible beeping will become continuous for 1 to 2 seconds followed by 5 to 6 very rapid beeps, then 1 to 2 seconds of silence. The unit then will return to the normal audible mode, but one LED will remain solid until reset. To reset the unit after a held reading is displayed, remove the unit from the line and simply press and release the power switch.

CAUTION

Once in the Auto-Hold Mode, the ARVI must be reset for the LEDs to indicate higher or lower voltages.

Overhead Operation

Prepare the Unit:

1. Select and install appropriate probe (hook, straight, or pigtail)
2. Mount on appropriate length insulating hotstick
3. Power on unit and test using a known energized voltage source within the indicating range of the ARVI, or with the appropriate Voltage Indicator Tester per the instructions on the tester
 - a. Upon power-up, each LED will illuminate individually from the lowest voltage to the highest followed by the audible alarm. These tests verify the function of the LEDs, alarm, batteries, and internal circuitry
 - b. Following the audible alarm, the “Power / Low Battery” LED will continuously flash. The unit is ready for use

Take a Reading:

1. While maintaining Minimum Approach Distance (MAD), raise the hotstick to place probe in contact with the conductor to be tested
 - a. Ensure that the green “Power / Low Battery” LED is flashing before, during, and after testing
 - b. Keep the ARVI perpendicular to the phase conductor and away from poles or structures a distance of at least twice the circuit’s phase spacing. If possible, test away from structures, jumpers, risers, cutouts, insulators, ground wires, and any system components that may cause reading errors
 - c. The audible alarm will begin to beep as the unit senses the electric field. The Range LED that corresponds with the system voltage level present on the conductor will begin to blink. The higher the voltage, the faster the beeping occurs. Audio and visual indications may begin before contact is made
2. Test three or four locations to check consistency. Where little or no consistency is apparent, consider the highest reading as correct
 - a. All interpretations should take into account the circuit configuration, length, proximity to other lines, and should be consistent with previous experience on the same circuit with this instrument

WARNING

If ever in doubt about interpreting ARVI readings under any circumstance, always assume circuit is energized and take appropriate safety precautions.

Hold Mode: Refer to page 6.

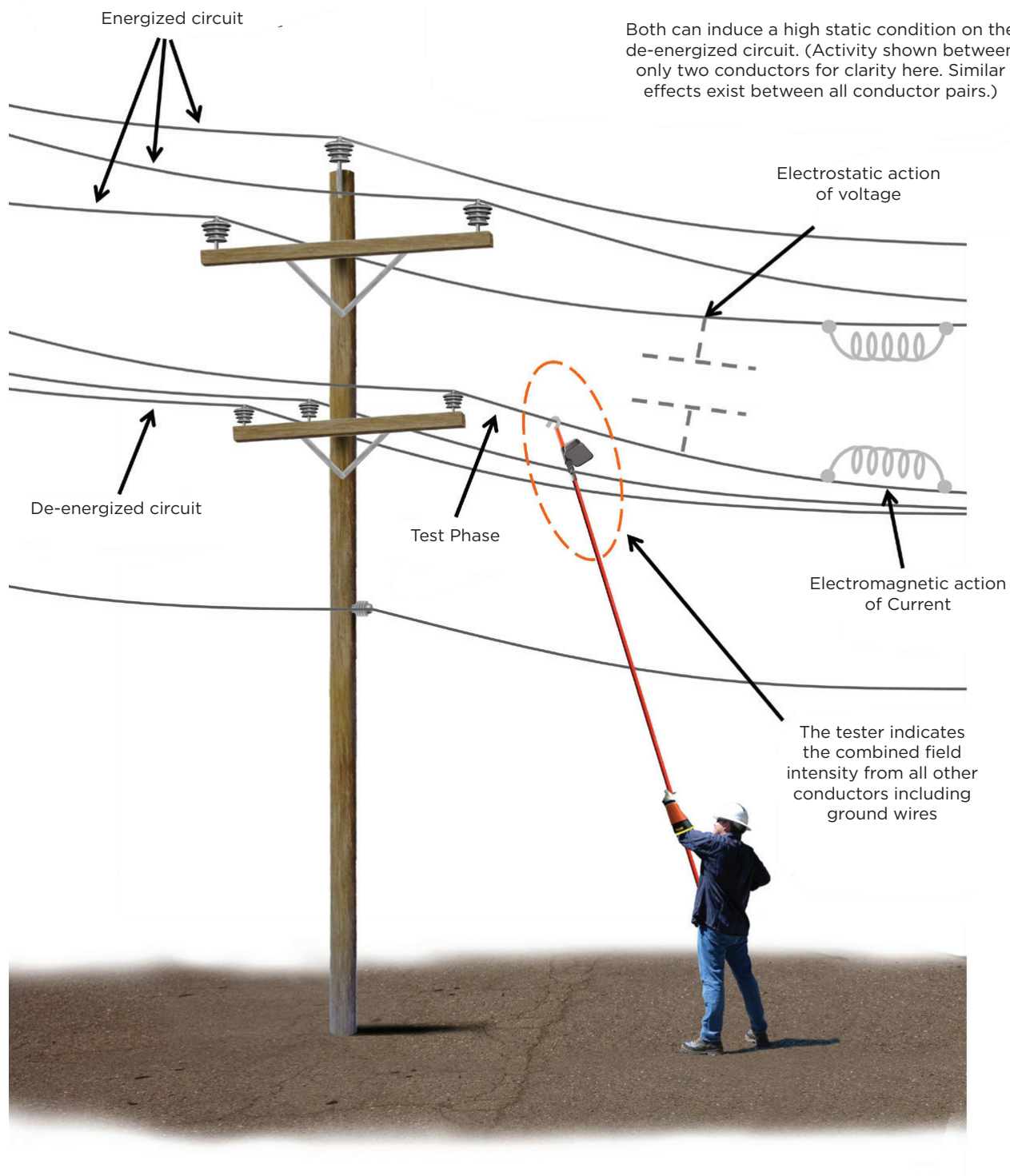
Turn the Unit Off:

To Turn the ARVI off, press and hold the Power button for 2 seconds, or the unit will automatically power off after approximately 15 minutes of inactivity.

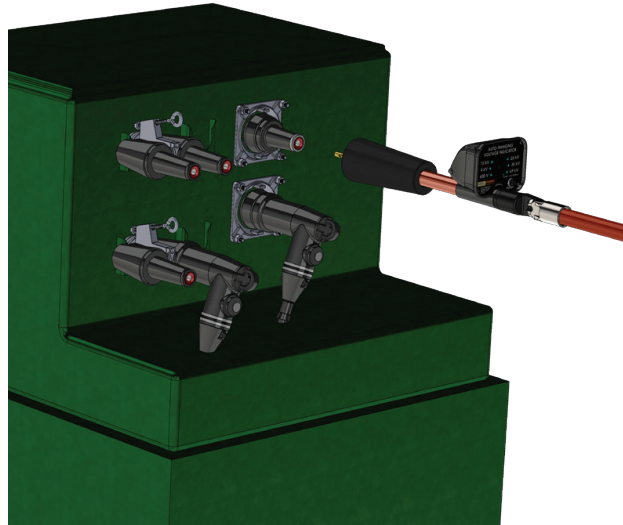
Overhead Operation (cont.)

NOTICE

The ARVI indicates the combined field intensity from all other conductors, including ground wires. Other energized or de-energized conductors or equipment in close proximity can affect the reading.



Underground Operation (C4033374 only)



ONLY USE THE C4033374 ON UNDERGROUND RESIDENTIAL DISTRIBUTION (URD) SYSTEMS. THIS UNIT IS NOT DESIGNED FOR USE WITH CAPACITIVE TEST POINTS. The C4033375 is for use on overhead transmission systems only.

Always use appropriate length insulating hotstick even when wearing rubber gloves. Contact with universal coupling or other parts, even when using rubber gloves, will cause erroneous voltage indication. Due to the close proximity of conductive metals, the readings taken in URD cabinets will typically be higher than on an overhead line.

As with overhead, the same basic rules and procedures apply when using the CHANCE® Auto-Ranging Voltage Indicator (ARVI) on underground systems. Follow these four very important additional instructions when using the tool on underground equipment:

DANGER

TO AVOID SERIOUS INJURY OR DEATH:

1. ALWAYS install an appropriate Bushing Adapter on the ARVI before interfacing with the Bushing Well when testing dead-front equipment
2. NEVER use Shepherd Hook, Pigtail Hook, or Straight Probe on the ARVI for testing URD equipment
3. NEVER use any probes or Bushing Adapters on the ARVI when testing live-front URD equipment. Only use a small hex-head machine screw (1/4-20 UNC x 3/8-inch long). Use EXTREME caution when testing live-front URD equipment
4. NEVER allow the universal coupling to: touch any part of the URD cabinet, become grounded in any way, or contact another phase

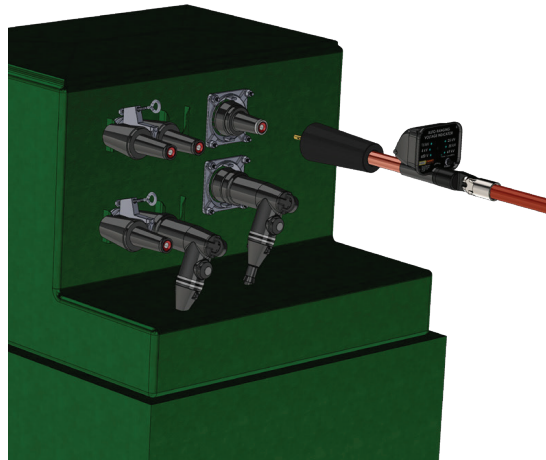
Underground Operation (C4033374 only) (cont.)

Prepare the Unit:

1. Mount on appropriate length insulating hotstick
2. Power on unit and test using a known energized voltage source within the indicating range of the ARVI, or with the appropriate Voltage Indicator Tester per the instructions on the tester

Take a Reading:

1. For dead-front, install the proper Bushing Adapter (see “Optional Accessories” section) on the ARVI. For live-front, install the included hex head machine screw (1/4-20UNC X 3/8 inches long)
2. While maintaining Minimum Approach Distance (MAD), use the hotstick to place the adapter or hex screw in contact with the equipment to be tested
3. The audible alarm will begin to beep as the unit senses the electric field. The Range LED that corresponds with the system voltage level present will begin to blink. The higher the voltage, the faster the beeping occurs. Audio and visual indications may begin before contact is made
4. Ensure that the green Power/Low Battery LED is flashing before, during, and after testing



Turn the Unit Off:

To Turn the ARVI off, press and hold the Power button for 2 seconds, or the unit will automatically power off after approximately 15 minutes of inactivity.

Optional Procedure for Elbow/Cable Test (C4033374 only)



Two linemen using insulating hotsticks and maintaining appropriate Minimum Approach Distances (MAD) are required to perform this procedure: one to pull and control the elbow, the other to control and read the ARVI.

Always follow all warnings, regulations, codes, and employer's work practices.

Battery Replacement



A low battery condition is indicated by chirps from the alarm when no electric field is present and the green “Power / Low Battery” LED flashes at an increased rate. Batteries can be replaced by carefully removing the two screws on the battery drawer and sliding the drawer away from the housing to expose the battery holder. Replace the four “AAA” batteries, noting proper polarity. Either Alkaline or Lithium batteries may be used. We recommend that you replace all batteries at the same time with new batteries, all the same type. Dispose of used batteries according to the battery manufacturers’ and local regulations.

NOTICE

This device contains no user serviceable components. Do not remove the front panel assembly.

⚠ CAUTION

Ensure that the wires connected to the battery holder remain connected and are not damaged. After the battery drawer and screws are replaced in the housing, test using a known energized voltage source within the indicating range of the ARVI, or with the appropriate Voltage Indicator Tester per the instructions on the tester.

The CHANCE® Voltage Indicators are electronic instruments and, if properly cared for, will provide many years of trouble-free service.

Cleaning:

- Keep all parts clean and dry
- Clean with damp cloth using only water and mild soap if necessary
- Thoroughly remove all soap residue and dry before placing back into service
- NEVER use CHANCE Moisture Eater II solvent or wipes on any part of the ARVI

Care and Storage:

- Always inspect for damage prior to each use
- Remove from service if damaged or if proper performance is in doubt
- Keep all labels clean and legible
- Never straighten or modify probes or adapters
- Do not drop; protect from jostling or impacts during storage, carrying, or use
- Store in a dry location
- To minimize risk of battery corrosion, remove batteries from the ARVI during long-term storage

Repairs

For Hubbell Power Systems authorized repair or factory calibration, please contact:



M.W. Bevins Co.

9903 E. 54th St.

Tulsa, OK 74146

(918) 627-1273

(918) 627-1294 (FAX)

www.bevinsco.com

Optional Accessories



C4033409: Tester for C4033374



C4033431: Tester for C4033375



T4030428: 15 kV Bushing Adapter



T4030857: 15 kV, 25 kV, 35 kV Bushing Adapter



T4030856: Elbow Adapter



Specifications

C4033374 operating voltage range: 600 V to 69 kV AC (Phase-to-Phase equivalent)

C4033375 operating voltage range: 69 kV to 500 kV AC (Phase-to-Phase equivalent)

Weight (w/o batteries): 1.8 lb. (0.8 kg)

Dimensions (L x W x H): 12.6 x 5.2 x 5.1 inches (319 x 131 x 129 mm)

Battery requirements: Four (4) Alkaline or Lithium “AAA” batteries

Operating temperature range: -20° to +80°C (-4°F to 176°F)

Operating humidity range: 5% to 95% Rh

Storage temperature: -20° to +60°C (-4°F to 140°F)

Recommended storage at 21°C +/- 2°C (70°F +/- 5°F)

Storage humidity range: 5% to 95% Rh

Recommended storage at 45% Rh +/- 8% Rh



As a world-renowned brand for hotline tools and temporary grounding equipment, we are dedicated to providing high quality tools that are critical for lineman safety.

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