

# Operating Instructions for **CHANCE**<sup>®</sup> Digital Voltage Indicator

Catalog No.	Voltage
<b>C403-2794</b>	<b>1 - 40kV</b>
<b>C403-2588</b>	<b>16 - 161kV</b>

## **⚠ CAUTION**

The equipment covered in this manual should be used and serviced only by competent personnel familiar with and following good work and safety practices. This equipment is for use by such personnel and is not intended as a substitute for adequate training and experience in safe procedures for this type of equipment.

These instructions neither cover all details or situations in equipment use nor do they provide for every possible contingency to be encountered in relation to installation, operation or maintenance. Should additional information and details be desired or if situations arise which are not covered adequately for the user's purpose, the specifics should be referred to the A.B. Chance Company.

## **NOTICE**

Before operating a Chance Digital Voltage Indicator, thoroughly read, understand and follow these instructions.  
Retain these instructions in the device case.

## **⚠ WARNING**

**High Voltage on universal fitting during use. Do not let universal fitting touch any part of URD cabinet or to become grounded in any other way. This will damage meter and may cause injury.**



POWER SYSTEMS, INC.

NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

210 North Allen  
Centralia, Missouri 65240

## Basic Design and Function

To confirm that a line is de-energized prior to performing maintenance, the Digital Voltage Indicator (DVI) presents field practicality over a voltmeter\* and obvious advantages over traditional methods without a meter. Readings from a DVI meter can be compared digitally rather than the subjective judgements associated with "fuzz-sticking" or "glow-detecting". In place of interpreting an arc's intensity or the degree of brilliance from a neon light, the DVI gives the operator a metered value.

Actually a field-intensity meter, the DVI is calibrated to read approximate line-to-line voltage when connected to any phase conductor. It responds to the magnitude of the field gradient between its end probe and floating electrode (at the universal hotstick-attachment fitting). If the universal fitting is close to a ground, another phase or another voltage source, the reading should tend to be high; if it is close to a jumper or equipment of the same phase, the reading should be low.

Readings will vary with the field intensity, determined by a great variety of field conditions including the proximity, size and orientation of all system components in the vicinity, both energized and grounded. Erroneous meter readings, when the line is actually energized, can result from both DVI electrodes being at the same electrical potential. To avoid such field distortions, keep the DVI as far away as practical from system components other than the specific conductor being tested.

The DVI should be used as a secondary means only to confirm the condition of a circuit after such principal work procedures as visual open gaps, dispatcher hold orders and apparatus tag-outs render the circuit de-energized.

Since it is not a voltmeter, no specific accuracy is claimed by the manufacturer and no specific accuracy should be assumed by the user.

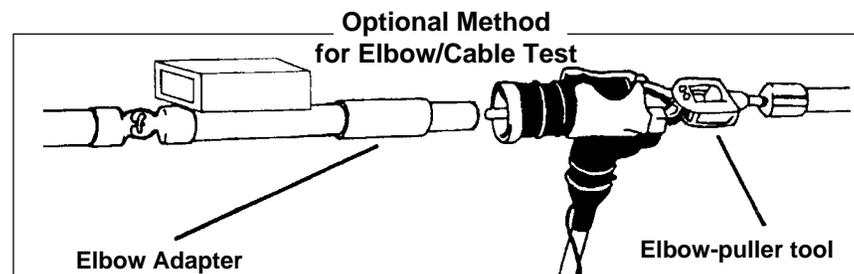
\* **Even if it were practical in the field to connect a voltmeter directly from a line to ground, an overbuilt circuit of a higher voltage could induce enough voltage on the de-energized line to make the voltmeter reading actually exceed normal line voltage.**

For repairs, contact:

**M.W. Bevins Company**  
 9903 E. 54 St.  
 Tulsa, OK 74146  
 Phone: (918) 627-1273

### ⚠ WARNING

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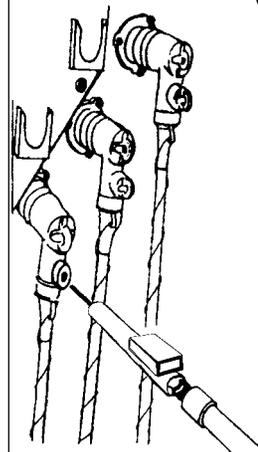


**Optional method of testing elbow/cable without using a feed-thru device:** One worker uses an elbow-puller tool to control elbow while another worker tests it with elbow adapter fitted on DVI.

### DVI Interpretations

Reading	Circuit Condition
Approximate line-to-line voltage	Energized
Zero	De-energized

*If in doubt about interpreting DVI reading under any circumstance, assume circuit is energized and take appropriate safety precautions.*



### Elbow Test-Point Method (Cat. No. C403-2794 DVI only)

- 1 Same as Step 1 on page 4.  
**Do not skip this.**
- 2 Thread straight probe into end fitting and mount DVI on proper length hot stick. Set the power switch in the **ON** position.

### ⚠ WARNING

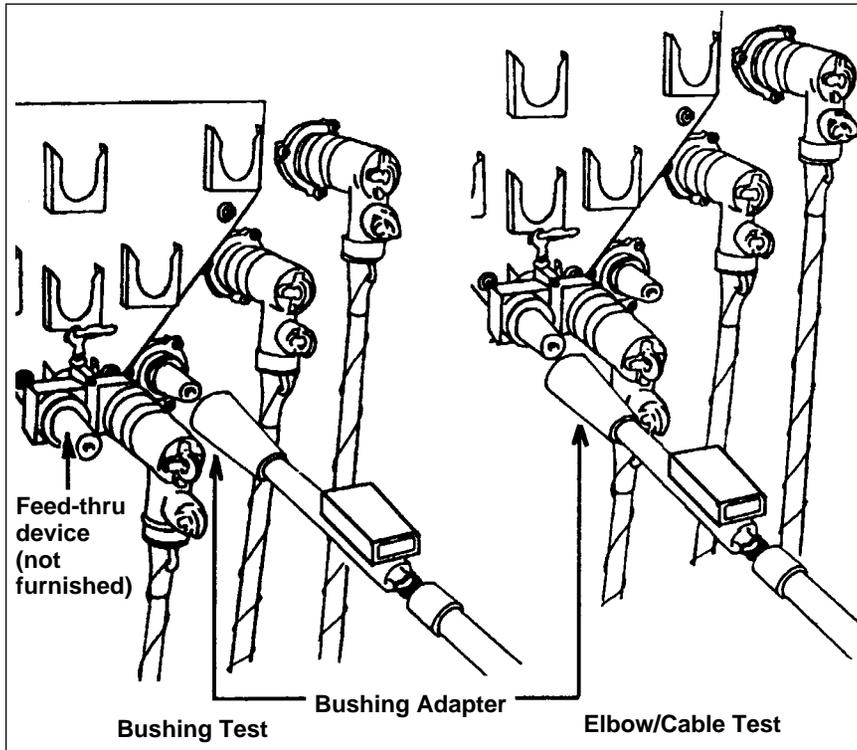
Small High-Voltage/Ground Clearances.  
 Do not use the straight probe for any high-voltage measurements, e.g., inserting into a bushing. This will cause a line-to-ground fault, with arcing, external to the bushing. Serious injury and meter damage will result.

- 3 Set the switch in the Test Point Position.
- 4 With hot-line tools, pull cap off test point and contact test point with probe. **Test point must be free of corrosion for test continuity.**
- 5 Meter should read circuit condition.

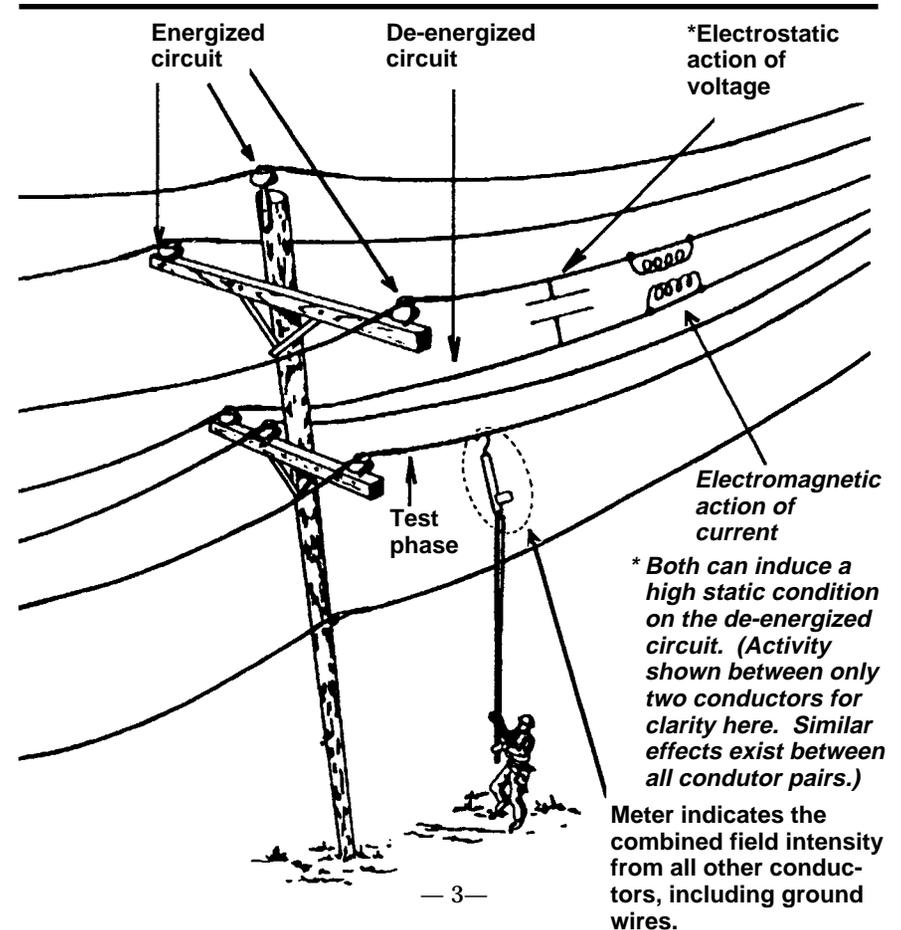
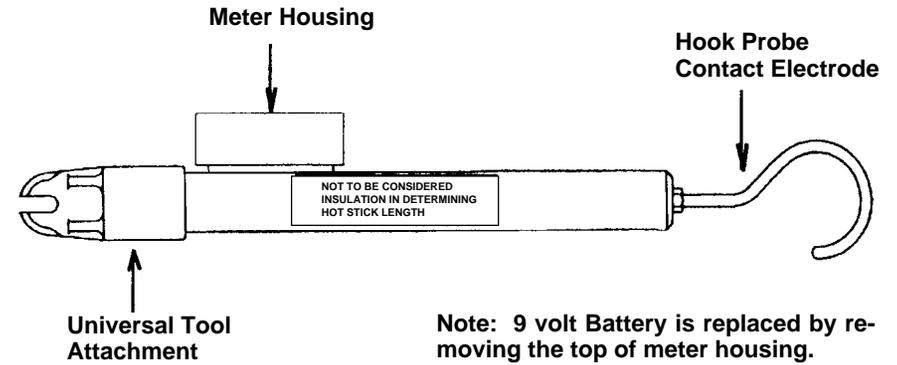
## Underground Work Procedures

To test for voltage presence on deadfront equipment with loadbreak elbows:

- 1 Check meter, battery and circuitry for proper operation as stated in the Overhead Work Procedure.
- 2 Thread bushing adapter into mounting-stick end fitting and attach DVI to insulated hot stick of proper length for system voltage involved.



- 3 Secure a temporary feed-thru device in a parking stand on the deadfront transformer or switch. Pull elbow with appropriate hot line tool and install elbow on feed-thru device.
- 4 To test both sides of interrupted circuit, insert bushing adapter into:
  - a. Apparatus bushing and
  - b. Feed-thru bushing, to check elbow/cable.



## Overhead Work Procedures

1. Check meter, battery and circuitry for proper operation by depressing the Power switch located on the front of the meter into the Test position. The meter should read the approximate battery voltage (with C403-2794 DVI set to Line position). A low battery may not allow the meter to read the full scale. A battery symbol appearing on the upper left corner of the LCD display indicates the battery needs to be replaced.

The peak hold feature of the meter can be tested by setting the Peak Hold switch in the On position. The Power switch is first depressed to the Test position and then set in the On position. The meter should read battery voltage. Place the Peak Hold switch to the Reset position and the meter should read zero. The voltage detector may read 1 or 2 kV, even in the absence of an electric field. This reading is within normal operating standards.

The circuitry between the end probe and the meter can be tested with an ohmmeter. A resistance of 15M ohms indicates proper operation.

2. Thread the hook probe into the end fitting of the DVI and attach universal fitting to an insulated hot stick of proper length for system voltage involved. Set the Power switch in the On position. The peak hold option may be utilized by first setting the Peak Hold switch into the Reset position and then to the On position.
3. Contact hook probe to each conductor on three-phase circuits following these guidelines:
  - a. Keep DVI perpendicular to the phase conductor.
  - b. Keep DVI away from poles or structures a distance at least twice the circuits phase spacing. That is, test out on span rather than near structure, jumpers, risers, cutouts, insulators, ground wires and any system components other than the conductor being tested.
  - c. Test three of four locations to check consistency. Where little or no consistency is apparent, consider the highest reading as correct.
4. Extra care should be taken when implementing the Peak Hold feature. In this mode the meter will retain only its highest reading, so it is mandatory that the DVI be kept clear of all conductors except for the one being tested. In the Peak Hold mode, the meter slowly charges up to the indicated voltage and discharges slowly once removed from the line. For best accuracy, keep DVI attached to line for 10 to 15 seconds or longer to obtain reading. The meter's reading should be taken as soon as possible after removal from the line due to the slow decline of the reading. Hurried actions are not needed, however, as the meter will retain its approximate highest reading for 10 to 15 seconds. The meter can be reset to zero by depressing the Peak Hold switch into the Reset position.

## Overhead Work Procedures

### Digital Voltage Indicator Interpretations

Reading	Circuit Condition
Approximate line-to-line voltage	Energized
Approximately zero	De-energized
Upscale, but well under line-to-line voltage	Probably de-energized; reading due to static. <b>Do not assume anything; check circuit condition by another method.</b>

*All interpretations should take into account the circuit configuration, length, proximity to other lines; and should be consistent with previous experience on same circuit with this instrument. If in doubt about interpreting reading under any circumstance, assume circuit is energized and take appropriate safety precautions.*

