

Instruments and Meters

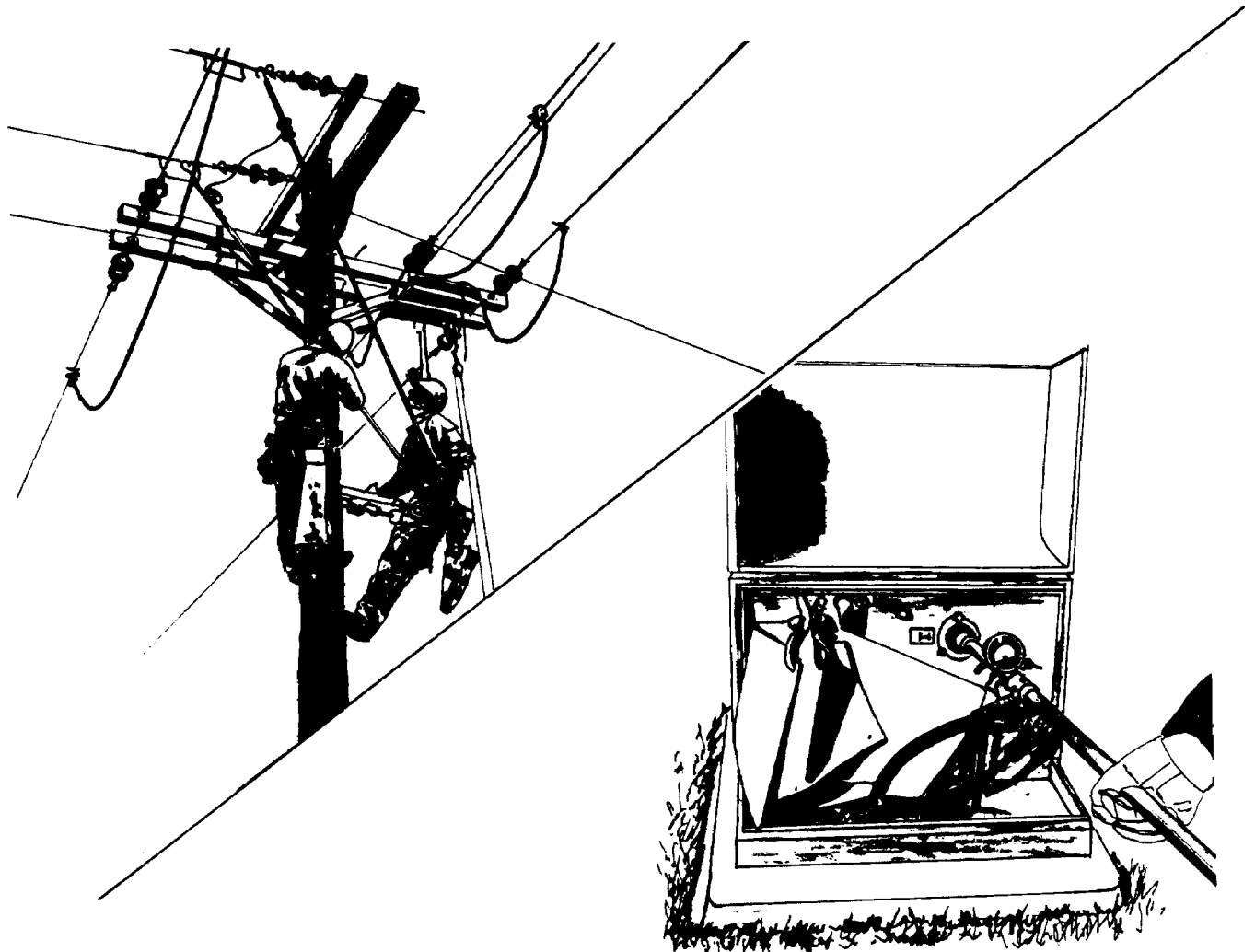
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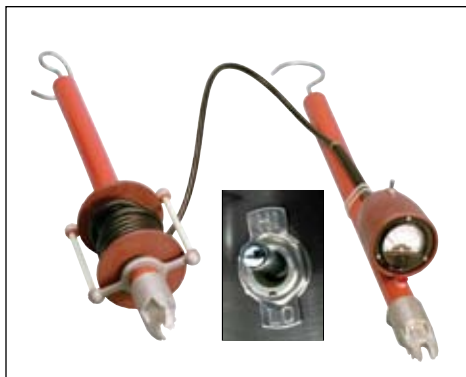
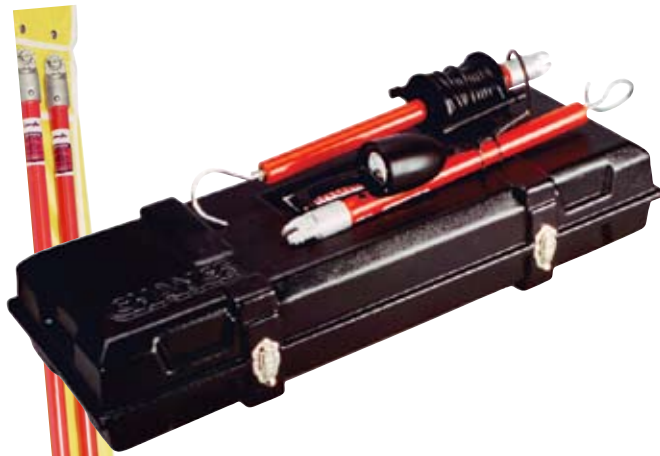
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Phasing Testers



For convenience on different systems, toggle on dual-range units can switch calibration between the two scales on the meter face. Plus, it can improve readability for low-end values on the Hi scale. Switched to the Lo range, those values deflect the needle more to give more finite readings.

To check instrument before and after each use, test-point jack in front of meter accepts plug from Phasing Volt-meter Tester, next page.



For URD testing, see Hi-Pot Adapters (page 2457) and Adapters for Elbows and Bushings (page 2467).

Extension Resistors, as installed ▼



• for †Distribution Circuits

Chance Phasing Testers easily determine phase relationships and approximate voltage, line-to-line or line-to-ground.

Each tester consists of two fiberglass poles with end fittings threaded for interchangeable probes. The probe fittings couple with a high-impedance component encased in each pole. To complete the test circuit, a 22-foot length of insulated flexible cable stores on the reel affixed to one pole and connects to the voltmeter on the other pole.

Simple to operate, the tester poles first attach to two 6-foot Epoxiglas® insulating universal handles (included in each kit for proper working clearances). Then the probes can be brought into contact with the conductors appropriate for the meter to read phase-to-phase or phase-to-ground voltage.

Distribution Phasing Testers

Single-Range Units

| Catalog No. | Description | Weight |
|-------------|--|------------------|
| H1876 | †16 kV Tester Kit* | 27½ lb./12.4 kg. |
| H18761 | †16 kV Tester Hook Probes, Case and Manual | 23 lb./10.4 kg. |
| T4032261 | 25 kV Tester Kit* | 27½ lb./12.4 kg. |
| H18767 | 40 kV Tester, Hook Probes, Case and Manual | 23 lb./10.4 kg. |

Dual-Range Units

| | | |
|----------|------------------------|------------------|
| T4030786 | 1 & †16 kV Tester Kit* | 27½ lb./12.4 kg. |
| T4032311 | 5 & †16 kV Tester Kit* | 27½ lb./12.4 kg. |
| T4032398 | 5 & †16 kV Tester Only | 23 lb./10.4 kg. |

*Each kit includes two 6-ft. x 1¼"-dia. Epoxiglas universal handles with storage bag, tester, hook probes, case and instruction manual.



1 & 16 kV Unit



5 & 16 kV Unit

Dual-Range Meters

†Extension Resistors

†To extend any Chance 16 kV Phasing Tester for 48 or 80 kV applications, optional Extension Resistors simply thread on in the field.

| | | |
|--------|--|-----------------|
| H18762 | Pair of Extension Resistors for up to 80 kV (32" long) | 6 lb./2.7 kg. |
| H18764 | Pair of Extension Resistors for up to 48 kV (21" long) | 4 lb./1.8 kg. |
| P6242 | Bag for 48 kV Resistors | 1 lb./0.45 kg. |
| P6244 | Bag for 80 kV Resistors | 1¼ lb./0.56 kg. |

Accessories

| | | |
|---------|--------------------------------------|----------------|
| H17601 | Universal Pole 1¼" x 6' — Two Needed | 1¾ lb./0.7 kg. |
| P6436 | Bag for Two Poles | 1 lb./0.45 kg. |
| H18763 | Case only for Tester | 2 lb./0.9 kg. |
| H18766P | Pigtail Hook Probe | ¼ lb./0.1 kg. |
| H18766S | Shepherd Hook Probe | ¼ lb./0.1 kg. |
| H18766 | Straight Probe | ⅓ lb./0.05 kg. |

Distribution Phasing Tester Kit *for Overhead and Underground Systems* **Dual Range: 5kV & 16kV Scales**



CHANCE®

2453

Versatile to popular distribution voltages, convenient Kit facilitates testing both underground and overhead systems. Basic functions include identifying phases and reading line-to-line or line-to-ground voltage. URD accessories in the Kit also permit cable-fault detection.

The main instrument consists of high-impedance components encased in two fiberglass poles with threaded end fittings for overhead probes or URD adapters. A 22-foot-long cable connects to the voltmeter pole and stores on the reel pole.



To detect faults on URD cable, Hi-Pot Adapter converts AC source to DC pulse. Effective field method quickly tests new, repaired or suspect spans.



To check instrument before and after use, Phasing Voltmeter Tester lead plugs into test-point jack by meter. Other lead clips onto each probe. Switch on Voltmeter Tester reverses polarity for thorough, easy field-checking procedure. Complete instructions included.



Complete Kit includes:
Two 6-ft. x 1 1/4"-dia. Epoxiglas® universal handles with storage bag, tester with instruction manual and two probes (shepherd hook and pigtail hook) in padded carrying case, plus four items below.

URD Accessories in Kit



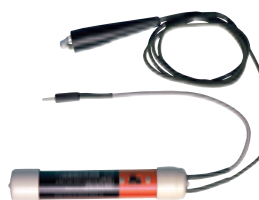
One
DC
Hi-Pot
Adapter
& Instructions

C4031762

Two
Bushing
Adapters



T4030857



Phasing
Voltmeter
Tester (with
battery)
in Kit

C4030838

H17601 Hotstick
P6436 Bag



Ordering Information

| Catalog No. | Description | Weight |
|-------------|---|---------------------|
| T4032557 | Phasing Tester Kit with 16kV Hi-Pot Adapter, 2 URD Bushing Adapters, Phasing Voltmeter Tester | 31 1/2 lb./14.2 kg. |

For convenience on different systems, toggle on meter housing can switch calibration between the two scales on the meter face. Plus, it improves readability for low-end values on the Hi (16kV) scale. Switched to the Lo (5kV) range, those values deflect the needle more to give more finite readings.

Digital Phasing Testers

- 16kV and 40kV models, plus 80kV extensions
- For Overhead & Underground

Display with backlight, hold, sleep modes

Large direct-reading display of Chance Digital Phasing Testers easily determine phase relationships and approximate voltage, line-to-line or line-to-ground.

Each tester consists of two fiberglass poles with end fittings threaded for interchangeable probes. The probe fittings couple with a high-impedance component encased in each pole. To complete the test circuit, a 22-foot length of insulated flexible cable stores on the reel affixed to one pole and connects to the electronic display module on the other pole.

Simple to operate, the tester attaches to two 6-foot Epoxi-glas® insulating universal handles (included in each kit for proper working clearances). Then the probes can be brought into contact with the conductors appropriate for the tester to display phase-to-phase or phase-to-ground voltage.

Pushbutton controls permit easy selection of options for display Backlight and Hold features. When not in use, the unit's Sleep mode automatically conserves the battery.

Hi-pot and higher voltage test accessories

For underground cable hi-pot testing, the 16kV Kit includes a DC Hi-Pot Adapter. Hi-pot testing cannot be done with the 40kV unit. Both the 16kV and 40kV Kits include underground bushing and elbow adapters. For overhead subtransmission systems, Extension Resistors are available as accessories specific to each Digital Phasing Tester.



To detect faults on underground cable, Hi-Pot Adapter converts AC source to pulsating DC. This effective field method quickly tests new, repaired or suspect cables.

Hi-Pot Adapter (on meter pole) and Bushing Adapters (on both poles) simply thread onto the Digital Phasing Tester in the field.



Large direct display with backlight and hold features



Basic Units:

Each Basic Unit Digital Phasing Tester includes the tester unit with meter and reel poles, a pigtail hook probe, a shepherd hook probe, instruction manual and hard shell padded case.

See next page for Tester Kits.

16kV Digital Phasing Tester Basic Unit
 Cat. No. C4033369 (14 lb./6.36 kg.)

40kV Digital Phasing Tester Basic Unit
 Cat. No. C4033370 (14½ lb./6.6 kg.)
 Hi-pot testing cannot be done with the 40kV unit.



Extension Resistors as installed for testing up to 80kV

Available as accessories, Extension Resistors simply thread onto the Digital Phasing Tester in the field.

Digital Phasing Testers

• For Overhead & Underground



Easy Verification Test

To check instrument before and after use, Phasing Voltmeter Tester lead plugs into test-point jack by meter.

Other lead clips onto each probe. Switch on Voltmeter Tester. Tester reverses polarity for thorough, easy field-checking procedure.

Complete instructions are included with each unit.

16kV Digital Phasing Tester Kit
Cat. No. C4033402 (22½ lb./10.2 kg.)



C403-3369
Digital
Phasing
Tester

C4031762
DC Hi-Pot
Adapter

T4030856
Elbow
Adapter

Two
T4030857
Bushing
Adapters

Two H17601
6-ft. x 1¼"-dia.
Epoxiglas®
universal poles
in P643-6 Bag

C4030838
Phasing
Voltmeter
Tester

40kV Digital Phasing Tester Kit
Cat. No. C4033403 (21½ lb./9.7 kg.)
Hi-pot testing cannot be done with the 40kV unit.



C4033370
Digital
Phasing
Tester

T4030856
Elbow
Adapter

Two
T4030857
Bushing
Adapters

Two H17601
6-ft. x 1¼"-dia.
Epoxiglas®
universal poles
in P643-6 Bag

C4030838
Phasing
Voltmeter
Tester

| Extension Resistors for 16kV Digital Phasing Tester | | |
|---|--|-----------------|
| H18762 | Pair of Extension Resistors for up to 80 kV (32" long) | 6 lb./2.7 kg. |
| H18764 | Pair of Extension Resistors for up to 48 kV (21" long) | 4 lb./1.8 kg. |
| P6242 | Bag for 48 kV Resistors | 1 lb./0.45 kg. |
| P6244 | Bag for H1876-2 80 kV Resistors | 1¼ lb./0.56 kg. |

| Extension Resistors for 40kV Digital Phasing Tester | | |
|---|--|----------------|
| C4033371 | Pair of Extension Resistors for up to 80 kV (21" long) | 4 lb./1.8 kg. |
| P6242 | Bag for C403-3371 80 kV Resistors | 1 lb./0.45 kg. |

NOTICE: Use ONLY the Extension Resistors specified for each Digital Phasing Tester as listed on this page. Extension Resistors are NOT interchangeable between 16kV and 40kV Digital Phasing Testers.

Accessories

| | | |
|---------|---------------------|----------------|
| H18766S | Shepherd Hook Probe | ¼ lb./0.1 kg. |
| H18766 | Straight Probe | ⅛ lb./0.05 kg. |

Analog Phasing Testers

Three kits for Transmission Circuits

To easily determine phase relationships, these Chance Phasing Testers read approximate voltage (line-to-line or line-to-ground) on transmission circuits. The testers consist of two high-impedance components encased in fiberglass poles, each with an end fitting threaded for interchangeable hook probes. A 22-foot-long insulated flexible cable from the voltmeter stores on a reel on the other pole. Three complete kits offer a choice of voltage ranges for specific system applications. Each kit includes a pair of 1¼"-diameter insulated handles for proper working clearances. Individual items listed in each kit's bill of materials may be ordered separately by reference numbers given.

Ordering Information

| Catalog No. | Description | Weight |
|-------------|----------------------------------|-----------------|
| C4030457 | 69-120 kV Phasing Tester Kit: | 39 lb./17.7 kg. |
| | (1) Instruction Manual | |
| | (1) E4030498 Tester (62" long) | 22½ lb. |
| | (2) C4030459 Handles (96") | 10 lb. |
| | (1) P6218 Bag for Handles (108") | 3½ lb. |
| C4030458 | 69-161 kV Phasing Tester Kit: | 44 lb./20 kg. |
| | (1) Instruction Manual | |
| | (1) E4030499 Tester (75" long) | 27½ lb. |
| | (2) C4030459 Handles (96") | 10 lb. |
| | (1) P6218 Bag for Handles (108") | 3½ lb. |
| T4032781 | 69-240 kV Phasing Tester Kit: | 60 lb./27.2 kg. |
| | (1) Instruction Manual | |
| | (1) E4032780 Tester (98" long) | 43½ lb. |
| | (2) C4030459 Handles (96") | 10 lb. |
| | (1) P6218 Bag for Handles (108") | 3½ lb. |

Phasing Voltmeter Tester

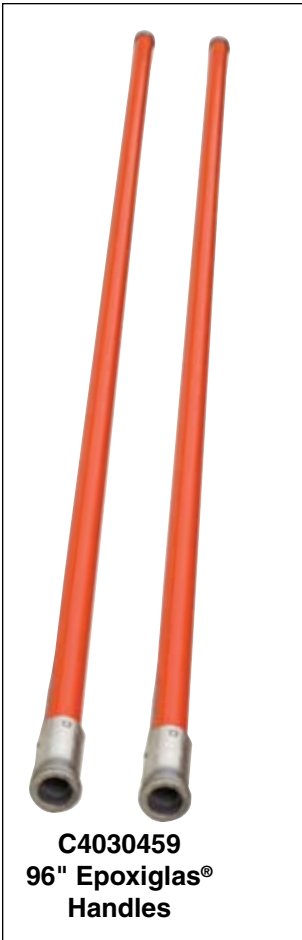
for Phasing Testers* (page 2452),
Phase Rotation Testers (page 2456),
Energized Insulator Testers (page 2460)
and Voltage Indicator (page 2462).

The phasing voltmeter tester allows line personnel to determine, in the field, the operating condition of the Chance instruments named above.

The tester uses each instrument's own meter to display its operating condition. The tester plugs into the jack on the instrument and meter readings are noted when the tester's clip is contacted to each of the instrument's two terminals and the tester's polarity switch is in both of its positions. If all four readings are within two units, the instrument is in proper working order. Pulling the plug from the jack automatically disconnects the tester's battery. The 9-volt battery, furnished, usually lasts one year and is easily replaced. The tester's durable and compact fiberglass housing will withstand the abuse of field applications.

| Catalog No. | Description | Weight |
|-------------|-----------------------------|----------------|
| C4030838 | Tool with leads and battery | 1 lb./0.45 kg. |

*Phasing Voltmeter Tester is designed for checking distribution-series voltmeters with extensions for 80 kV and below.



Digital Phasing Testers

Two Kits for Transmission Circuits

With digital readout and hold function, otherwise perform the same functions as analog testers on page 2456.

Ordering Information

| Catalog No. | Description | Weight |
|-------------------|--|--|
| PSC4033465 | 10 - 120 kV Phasing Tester Kit: (1) Instruction Manual (1) PSE4033454 Phasing Tester (64" long) (2) C4030459 Handles (96") (1) P6218 Bag for Handles (108") (1) C4030460 Bag for Tester | 39 lb./17.7 kg. 22½ lb. 10 lb. 3½ lb. 3 lb. |
| PSC4033466 | 40 - 240 kV Phasing Tester Kit: (1) Instruction Manual (1) PSE4033455 Phasing Tester (102" long) (2) C4030459 Handles (96") (1) P6218 Bag for Handles (108") (1) C4030464 Bag for Tester | 60 lb./27.2 kg. 43½ lb. 10 lb. 3½ lb. 3 lb. |

Phasing Voltmeter Tester

for Digital Transmission Phasing Testers above

Exclusively for use with only Digital Phasing Testers above, otherwise the functional equivalent of Phasing Voltmeter Tester on page 2456.

PSE4033473

**Phasing Voltmeter Tester
for Digital Transmission
Phasing Testers**



D.C. Hi-Pot URD Test Adapters

For quick, reliable fault detection on underground cables, two units are available for phase-to-phase system voltages up to 16 kV or 35 kV. By converting A.C. source voltage to a rectified half-wave, these adapters permit testing of cables with a potential level equal to peak source voltage. This field-effective method proves especially beneficial for:

- Testing new cable before initial energizing.
- Testing repaired cable before re-energizing.
- Testing suspect cable spans for faults.

For metered readout, the Hi-Pot Adapters work with Chance Phasing Tool H1876 (page 2452). A brass male fitting inside



**Large direct display with
backlight and hold features**



**40 - 240 kV
Digital Transmission
Phasing Tester**

**10 - 120 kV
Digital Transmission
Phasing Tester**

the larger end threads onto the meter probe of the phasing tool. For testing and subsequent discharging, a brass female fitting at the smaller end accepts either Chance Elbow Adapters or Bushing Adapters for 15 through 35 kV (pages 2456 and 2457).

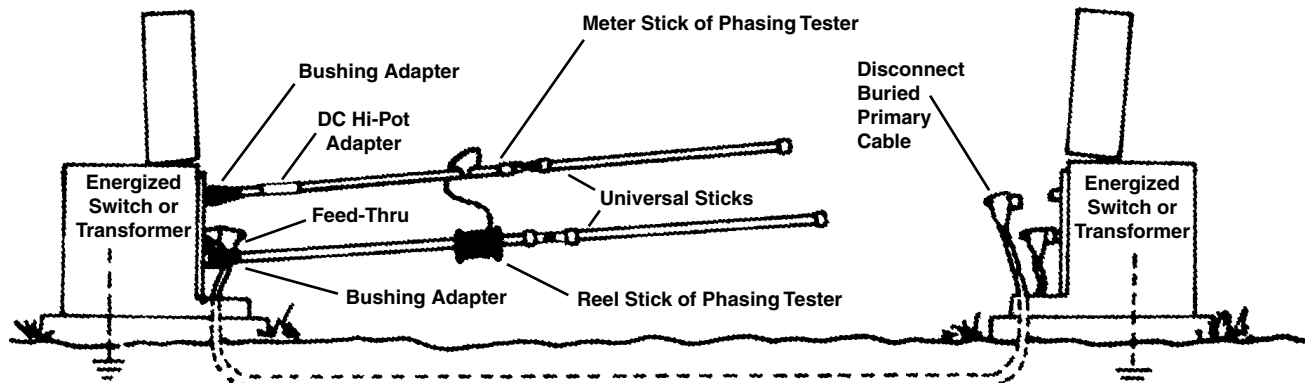
Illustrated instruction booklet is included. Units contain high-voltage rectifiers encapsulated in Chance orange 1¼" and 1½" diameter Epoxiglas® housings.

Hi-Pot Adapters measure only 13" in length for 35 kV unit, and 10" for 16 kV unit, far right.

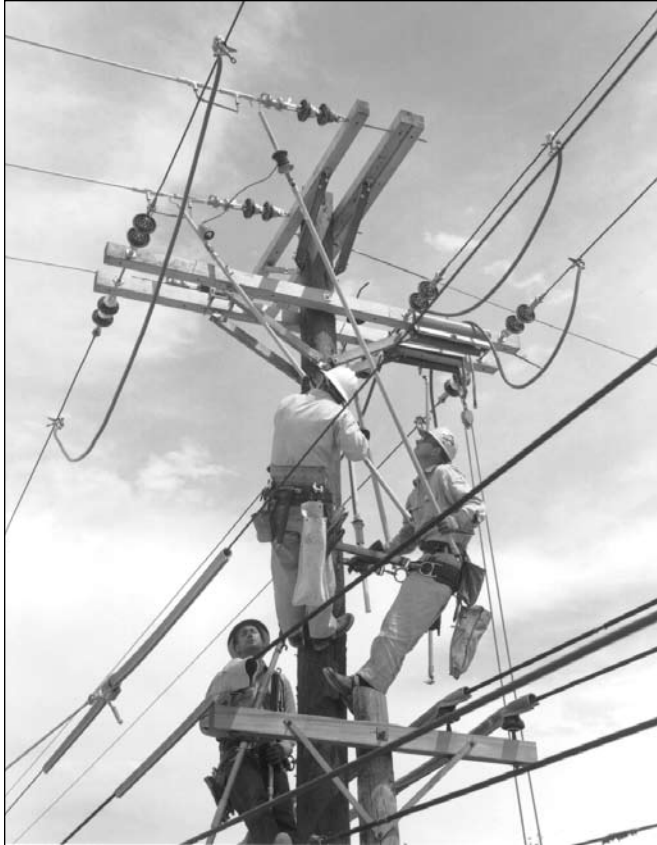


| Catalog No. | Description | Weight, each |
|-------------|-----------------------|-----------------|
| C4031762 | *16 kV Hi-Pot Adapter | 1 lb./0.45 kg. |
| C4031763 | *35 kV Hi-Pot Adapter | 1¼ lb./0.57 kg. |

*Maximum phase-to-phase system voltage.



Phase Rotation Tester



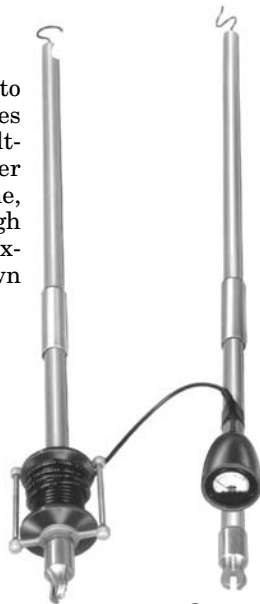
To determine the correct phase-rotation relationship, this portable instrument features construction similar to Phasing Tester H18761, page 2352. An additional grounding circuit on the Phase Rotation Tester sets it apart for the specific purpose named. The tester consists of two fiberglass poles with end fittings threaded for interchangeable probes. The probe fittings couple with a high-impedance component encased in each pole. A 22-foot length of insulated cable stores on the reel affixed to one pole and connects to the voltmeter on the other pole.



Grounding terminal below the meter permits connection to a known ground for proper operation. To check the instrument before and after each use, a test-point jack in front of the meter accepts the plug from Phasing Voltmeter Tester C4030838, shown on page 2453.

Application Range

The basic tool attaches to Epoxiglas® Universal Poles of proper length for the voltage being worked. Meter displays up to 16 kV alone, or can read circuits through 69 kV with the thread-on Extension Resistors, as shown at right.



Ordering Information

| Catalog No. | Description | Weight |
|-------------|--|-----------------|
| H1879 | Phase Rotation Tester, 16 kV, with Case | 23 lb./10.4 kg. |
| H18762 | Pair of Extension Resistors for through 80 kV, Length: 43" | 6 lb./2.7 kg. |
| H18764 | Pair of Extension Resistors for through 48 kV, Length: 25" | 4 lb./1.8 kg. |
| H17601 | Universal Pole, 1¼" x 6', Two Needed | 1¾ lb./0.7 kg. |
| P6436 | Bag for Two Universal Poles | 1 lb./0.45 kg. |
| P6242 | Bag for 48 kV Extension Resistors | 1 lb./0.45 kg. |
| P6244 | Bag for 80 kV Extension Resistors | 1¼ lb./0.56 kg. |
| H18763 | Carrying Case Only for Tester | 2 lb./0.9 kg. |

Auto-Ranging Voltage Indicator (ARVI)



CHANCE

2459

Complies with OSHA 1910.269 to Test for Absence of Nominal Voltage

• 600V to 69kV • For Overhead & Underground

Bright display lights indicate voltage class

This smart new-generation instrument makes hot-line voltage testing easier than ever. Its state-of-the-art electronics eliminate the need for a selector switch. Its automatic-ranging function quickly displays the approximate line-to-line voltage class. It provides an easy, yet reliable means for the operator to determine if a line is:

- De-energized, or
- Carrying less than normal system voltage from any source or induced charged from an adjacent live circuit, or
- Energized at full system voltage.

Simple to operate, the tester attaches to an Epoxiglas® insulating universal handle of appropriate length to maintain proper OSHA working clearances. A single pushbutton activates the instrument, then a single light indicates either Power On (by glowing solid) or Low Battery (by blinking). With a good battery condition, the instrument performs a confirming self-test by illuminating each of the six indicator lights in series while emitting an alternating audible signal.

Then the probe can be brought into contact with the conductor. It automatically begins detecting at approximately 480 Volts and holds the display of one of these voltage classes: 600V, 4kV, 15kV, 25kV, 35kV or 69kV phase-to-phase. The audible signal begins as a slow beeping that becomes faster as the final reading is displayed.

When not in use, the unit's energy-saving Sleep mode automatically conserves the battery.

Overhead and Underground capabilities

For overhead testing, a Shepherd Hook probe is included with the Basic ARVI (Auto-Ranging Voltage Indicator).

For underground testing, Elbow Adapter T4030856 and Bushing Adapter T4030857 are included in the ARVI Kit. They simply thread onto the ARVI in the field to check for voltage at switch bushings or elbows on cables, using a feed-thru device.



Large easy-to-read display activates each red light, one at a time, beginning at the low end and finally holds on the light for the phase-to-phase voltage class detected.

**ARVI
Auto-Ranging
Voltage Indicator**



**Basic ARVI
for Overhead Applications**

Catalog No. C4033374 (5½ lb./2.5 kg.)

Includes the tester unit, a shepherd hook probe, instruction manual and hard shell padded case.



**Elbow Adapter
T4030856
for 15, 25, 35kV**



**Bushing Adapter
T4030857
for 15, 25, 35kV**



**Voltage Indicator
Tester C4033409**

**ARVI Kit
for Overhead and Underground
Catalog No. T4033418 (16¼ lb./7.37 kg.)**
Includes the tester unit, shepherd hook probe, elbow adapter, bushing adapter, voltage indicator tester, instruction manual and hard shell padded case.

Accessories

| | | |
|---------|---------------------|----------------|
| H18766S | Shepherd Hook Probe | ¼ lb./0.1 kg. |
| H18766 | Straight Probe | ⅛ lb./0.05 kg. |

Transmission Auto-Ranging Voltage Indicator (ARVI)

Complies with OSHA 1910.269 to Test for Absence of Nominal Voltage
• 69kV to 500kV • For Overhead Conductors

Bright display lights indicate voltage class

This smart new-generation instrument makes hot-line voltage testing easier than ever. Its state-of-the-art electronics eliminate the need for a selector switch. Its automatic-ranging function quickly displays the **approximate line-to-line voltage class**. It provides an easy, reliable means for the operator to determine if a line is:

- De-energized, or
- Carrying less than normal system voltage from any source or induced charged from an adjacent live circuit, or
- Energized at full system voltage.

Simple to operate, the tester attaches to an Epoxiglas® insulating universal handle of appropriate length to maintain proper OSHA working clearances. A single pushbutton activates the instrument, then a single light indicates either Power On (by glowing solid) or Low Battery (by blinking). With a good battery condition, the instrument performs a confirming self-test by illuminating each of the six indicator lights in series while emitting an **alternating audible signal**.

Then the probe can be brought into contact with the conductor. It automatically begins detecting at approximately 69kV and holds the display of one of these voltage classes: 69kV, 115kV, 161kV, 230kV, 345kV or 500kV phase-to-phase. The audible signal begins as a slow beeping that becomes faster as the final reading is displayed.

When not in use, the unit's energy-saving Sleep mode automatically conserves the battery.

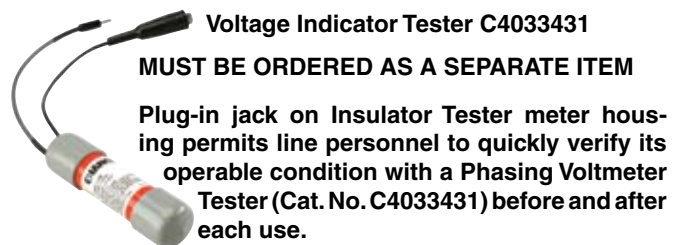


**Transmission ARVI
(Auto-Ranging Voltage Indicator)
Cat. No. C4033375 (5½ lb./2.5 kg.)**

Includes the tester unit, a shepherd hook probe, instruction manual and hard shell padded case.

JUNE 2006

Large easy-to-read display activates each red light, one at a time, beginning at the low end and finally holds on the light for the phase-to-phase voltage class detected.



Voltage Indicator Tester C4033431

MUST BE ORDERED AS A SEPARATE ITEM

Plug-in jack on Insulator Tester meter housing permits line personnel to quickly verify its operable condition with a Phasing Voltmeter Tester (Cat. No. C4033431) before and after each use.

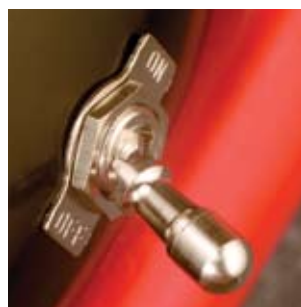
Accessories

| | | |
|---------|---------------------|-----------------|
| H18766S | Shepherd Hook Probe | ¼ lb./0.1 kg. |
| H18766 | Straight Probe | ⅛ lb./0.05 kg.. |

HUBBELL / CHANCE — CENTRALIA, MISSOURI

Multi-Range Voltage Detector

Lighted-dial model for systems through 40 kV



Light Switch



Self-test
Button



Overhead
Voltage-Presence
Test with Hook
Probe

Easier-to-read, illuminated dial

The lighted-dial option sets this unit apart from features standard on Multi-Range Voltage Detector (MRVD) C4030979, shown on next page. Powered by the unit's internal battery (included), a long-life bulb gives a glow to the meter face so the scale is easy to read in most conditions.

To conserve the battery, a special switch locks the light off when not in use. Its spring-loaded toggle must be pulled up to move it over the stop between its on and off positions. This helps keep the switch from being flipped on accidentally while the unit is not in use.

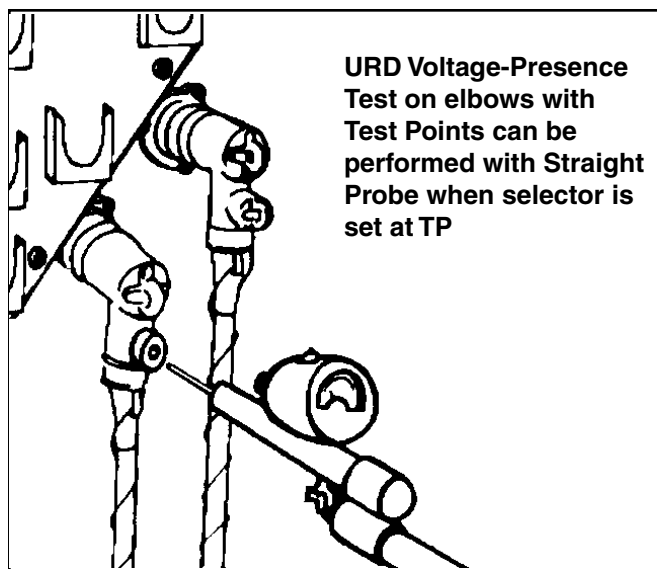
Standard features

To confirm that a line is de-energized prior to performing maintenance on it, the MRVD presents field practicality. Actually a field intensity meter, the MRVD 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's close to a jumper or equipment of the same phase, the reading should be low.

The MRVD gives metered readout capable of distinguishing actual line voltage from static or feedover from an adjacent line. Readings from an MRVD can be compared with numerical certainty rather than the subjective judgments associated with "fuzz-sticking" or "glow-detecting." Since the MRVD is not a voltmeter, no specific accuracy is claimed by the manufacturer or can be assumed by the user.

Operation

The MRVD must be mounted on proper length hotstick for the voltage class involved. Complete instructions are furnished with easy, illustrated step-by-step procedures. Internal circuit and pushbutton permit check before and after each use to confirm operational condition of instrument and battery.



URD Voltage-Presence
Test on elbows with
Test Points can be
performed with Straight
Probe when selector is
set at TP

Accessories

| | | |
|---------|---------------------|----------------|
| H18766S | Shepherd Hook Probe | ¼ lb./0.1 kg. |
| H18766 | Straight Probe | ⅛ lb./0.05 kg. |

Ordering Information



Includes:

- Straight probe for URD elbows with test points
- Hook probe for overhead uses
- Instructions and storage case

| Catalog No. | Scale | Weight |
|-------------|-----------|----------------|
| T4033228 | 1 - 40 kV | 5½ lb./2.5 kg. |

Multi-Range Voltage Detectors

for Overhead Systems to 600 kV and URD Elbow Test Points*



Overhead Voltage-Presence Test can be performed by all models.

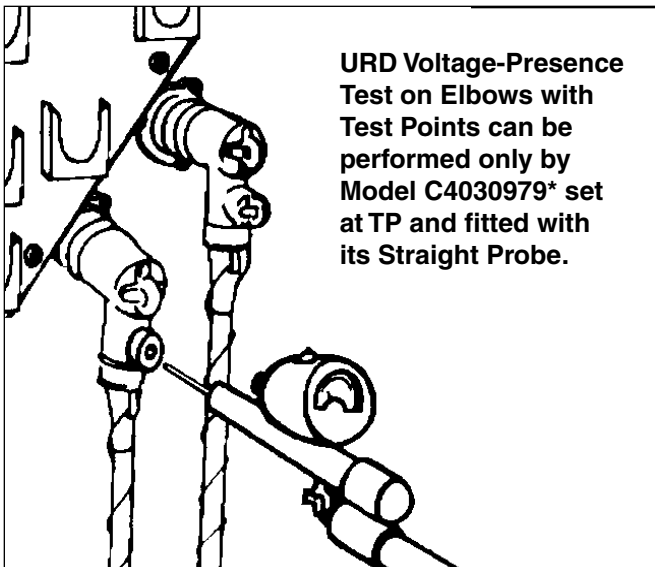


Self-test Button ▶

Switch on C4030979* includes Test Point.



C4030979*



URD Voltage-Presence Test on Elbows with Test Points can be performed only by Model C4030979* set at TP and fitted with its Straight Probe.

Design Features

To confirm that a line is de-energized prior to performing maintenance on it, the Multi-Range Voltage Detector (MRVD) presents field practicality. Actually a field intensity meter, the MRVD 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's close to a jumper or equipment of the same phase, the reading should be low.

The MRVD gives metered readout capable of distinguishing actual line voltage from static or feedover from an adjacent line. Readings from an MRVD can be compared with numerical certainty rather than the subjective judgments associated with "fuzz-sticking" or "glow-detecting." Since the MRVD is not a voltmeter, no specific accuracy is claimed by the manufacturer or can be assumed by the user.

Operation

Available in modes for various ranges, the MRVD must be mounted on proper length hotstick for the voltage class involved. Complete instructions are furnished with easy, illustrated step-by-step procedures. Internal circuit and push-button permit check before and after each use to confirm operational condition of instrument and battery.



C4031029 or C4031140

Ordering Information

Distribution and Transmission Multi-Range Voltage Detectors

| Catalog No. | Scales | Weight |
|-------------|-------------|----------------|
| C4030979* | 1 - 40 kV | 5½ lb./2.5 kg. |
| C4031029 | 16 - 161 kV | 5½ lb./2.5 kg. |
| C4031140 | 69 - 600 kV | 5½ lb./2.5 kg. |

*For testing URD elbows with test points, only model C4030979 on this page includes straight probe and "TP" setting on selector switch (as well as hook probe for overhead uses).

For other URD models and Accessories, see next page.

HUBBELL / CHANCE — CENTRALIA, MISSOURI

Multi-Range Voltage Detectors for Overhead & URD Systems to 40 kV

This Multi-Range Voltage Detector (MRVD) tests both overhead and underground distribution systems in voltage classes from 5 through 40 kV. This model provides an easy, yet reliable means for the operator to determine if a line is:

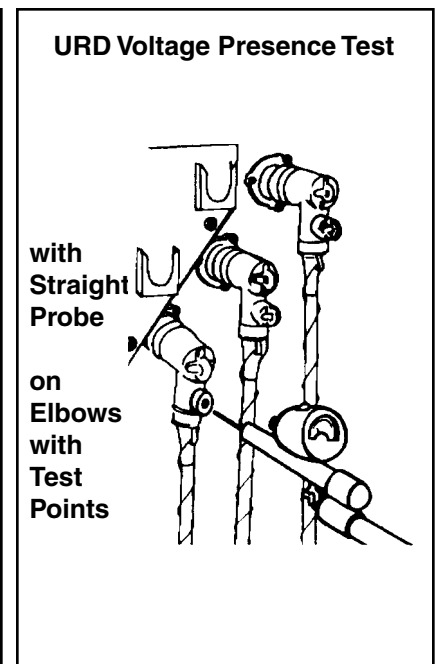
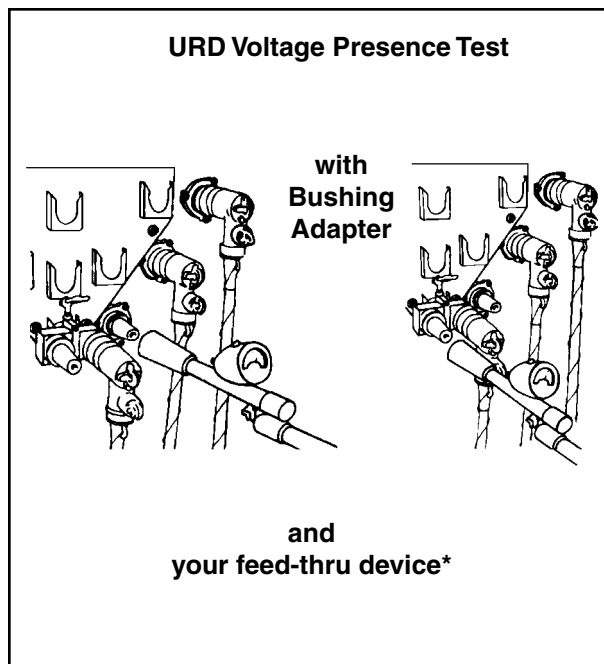
- a) De-energized, or
- b) Carrying less than normal system voltage from any source or induced charged from an adjacent live circuit, or
- c) Energized at full system voltage.

For this basic function, this model adapts to both overhead lines as well as URD circuits with 200 and 600 Amp load-break elbows, including those with and without capacitance test-points. Interchangeable probes and adapters just thread into the MRVD end fitting and the selector switch dials to the voltage range or test point (T.P.) setting appropriate to each application. Furnished owner's manual illustrates operating details for all models.



T4032271
for Overhead and for URD Loadbreak Elbows

This model is capable of these three tests:



**Elbow Adapter also furnished to complete test when not using a feed-thru bushing device.*

Ordering Information

**5-15-25-40 kV Multi-Range Voltage Detector
with TP Setting for Test Point on URD Elbows**

| Catalog No. | Description | Weight |
|-------------|---|---------------|
| T4032271 | MRVD, Hook & Straight Probes, Elbows & Bushing Adapters, Case | 6 lb./2.7 kg. |

Accessories

| | | |
|---------|---------------------|----------------|
| H18766S | Shepherd Hook Probe | ¼ lb./0.1 kg. |
| H18766 | Straight Probe | ⅛ lb./0.05 kg. |



Digital Voltage Indicators

for Distribution and Transmission Systems

• Calibrated to read approximate phase-to-phase voltage

Application

As tools for linework, these two Digital Voltage Indicators (DVI) apply to most system voltages. The Distribution DVI provides 1 to 40 kV readouts; and the Transmission DVI covers 16 to 161 kV. For overhead applications, the hooked probe hangs directly onto the conductor or apparatus. For underground systems, the Distribution DVI can indicate voltage at elbow test points or through bushings and elbows.

For such uses as confirming a “dead” condition before placing temporary grounds for de-energized maintenance, both models provide an easy, yet reliable, means to determine if a line is:

- De-energized...
- Carrying less than normal system voltage from any source or induced charges from an adjacent live circuit...
- Energized at full system voltage.

Special Design Features

Simply by selecting “Peak Hold,” the DVI will retain the display of its approximate highest reading for 10-15 seconds.

A built-in self-test function allows for a quick check of the meter before and after each use.



Ordering Information

1 to 40 kV Distribution DVI model
includes both types of probe (hook for overhead lines and straight for underground test points).

16 to 161 kV Transmission DVI model
includes only the hook probe

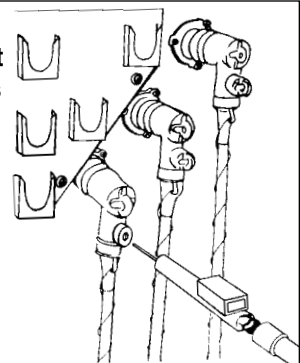
Both models include a 9-volt battery, carrying case and illustrated operating instructions.

| Catalog No. | Description | Kit Weight |
|-------------|------------------------------|------------------|
| C4032794 | 1 - 40kV Voltage Indicator | 7¾ lb./3.5 kg. |
| C4032588 | 16 - 161kV Voltage Indicator | 7½ lb./3.375 kg. |



URD voltage presence test on cable with elbow placed on a feed-thru device can be performed by DVI fitted with Bushing Adapter T4030857. For this test, “Line” must be selected on switch panel of Distribution DVI model. Transmission DVI model does not have Line/Test Point switch.

URD voltage presence test on elbows with test points can be performed only by Distribution DVI model C4032794 fitted with straight Probe and “Test Point” selected on switch panel.



Accessories

| | | |
|---------|---------------------|----------------|
| H18766S | Shepherd Hook Probe | ¼ lb./0.1 kg. |
| H18766 | Straight Probe | ⅛ lb./0.05 kg. |

Energized Insulator Testers



• for Distribution and Transmission Systems

Operation

A sensitive voltmeter, the tester measures the difference in potential across each insulator in a suspect string. Comparative readings from satisfactory strings in the same operating situation quickly indicate the state of every insulator in the string being tested. The meter places only a minimal load on the phase as it requires only a small leakage current to make a reading.

Two straight steel probes threaded into the tester forks simply contact the metal fittings on both ends of each insulator at the same time. Mounted on a 1½"-diameter Epoxiglas® pole with a universal fitting, before each use the tester should be attached to the proper length hot stick for the system voltage involved.

The distribution model's scale reads up to 11 kV. The transmission model's scale reads a maximum of 16 kV.

Applications

Without interrupting service, one of these testers quickly can check the condition of each insulator in a string. This greatly reduces maintenance costs. Rather than changing out entire strings, only the insulators identified as damaged require replacements.

Available in two models, the testers serve specific applications: One for deadend insulators on distribution systems through 35 kV, and the other for suspension insulators on 44 kV through 500 kV transmission systems.



**Transmission Tester
C4032299**



**Distribution Tester
C4032298**



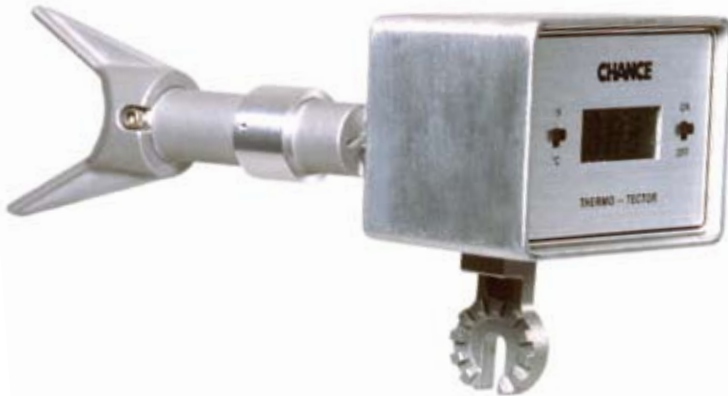
Plug-in jack on Insulator Tester meter housing permits line personnel to quickly verify its operable condition with a Phasing Voltmeter Tester (Cat. No. C4030838) before and after each use.

Energized Insulator Testers (each includes instrument, two straight probes, operating instructions and metal carrying case)

| Catalog No. | System Applications | Weight |
|-------------|-------------------------------|----------------|
| C4032298 | Distribution (thru 35 kV) | 4 lb./1.8 kg. |
| C4032299 | Transmission (44 thru 500 kV) | 5 lb./2.25 kg. |

*Carrying case weighs additional 10¼ lb. (4.62 kg.)

Digital Thermo-Tector



Application

The Digital Thermo-Tector is used to measure the surface temperature of energized contact surfaces such as connectors, conductors and bus. By comparing two or more temperature readings, the Thermo-Tector determines whether each segment is properly carrying load currents.

For use on or near energized circuits, the Thermo-Tector must be mounted on an insulated Universal Hot Stick. The probe tip can be rotated and adjusted to place the tip firmly against the surface to be measured and so that the temperature can be read easily by the operator from many work positions. The unit can be used on both overhead and underground electrical systems. Temperatures can be read with rapid response ranging from -50° to 450° Fahrenheit or -45° to 235° Celsius.

The unit is unaffected by high voltage fields and can be used on any voltage, provided an insulated hot stick of proper length is used.

Design

The Thermo-Tector employs solid state electronics with large ½"-digital readout characters on a reflective display surface. The unit's memory holds a reading until the next contact is made. The accuracy of the unit is $\pm 5\%$ in normal operating conditions. A selector switch permits Fahrenheit or Celsius readings.

The V-shaped guide on the probe tip allows precise placement on small surface areas. The V-guide can be snapped-off when using the Thermo-Tector on flat bus or large conductors. Each unit comes with an underground probe extension for panel boards, padmounted transformers and switches, cubicles or manholes where clearances are restricted.

A padded carrying case is included.

| Cat. No. | Description | Approx. Wt. |
|----------|---|--------------|
| C4031940 | Complete Digital Thermo-Tector including carrying case, V-guide, underground probe extension and instruction sheet. | 1½ lb./7 kg. |



Operation

First set the selector for the desired Fahrenheit or Celsius reading; then turn on the power switch. Mount the unit on a Universal Hot Stick and press the thermocouple probe tip flush against the connector, conductor or bus surface. The Thermo-Tector rapidly gives a reading and holds it until another contact is made or the power switch is turned off. If the power switch is left on, the last reading cancels and the unit automatically shuts off after five minutes.

Standard 9-volt batteries included have a service life of approximately 250 hours. A low-battery display on the unit face indicates when battery power is waning.



Voltage Tester for Underground Transformers



CHANCE

2467



The Chance Voltage Tester is a portable device which permits the checking of the AC voltages on Underground Distribution circuits through 20 kV for the purpose of determining the approximate line-to-ground voltage of the circuits.

The basic instrument, C4031369, is designed for reading voltages up to 10 kV on the meter. The resistance units are encapsulated in an epoxy compound to protect them from mechanical damage and to prevent moisture penetration or accumulation around the resistors. No calibration is required, the tool is preset at the factory.

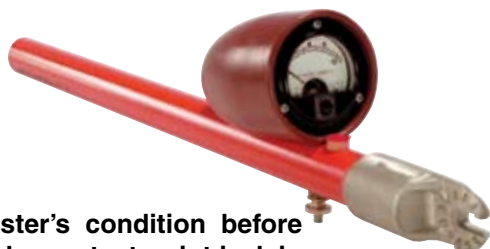
For use on voltages above 10 kV phase-to-ground, an extension resistor, is provided, increasing the voltage range to 20 kV phase-to-ground. (Do not use more than one extension resistor element per tool.)

The ground connection is made to a stud on the stick below the meter housing. This stud **MUST** be electrically connected to a good ground source.

Before the Voltage Tester is used to test elbows or bushings on dead front URD equipment, the proper adapter must be attached to the tool.

Elbow must be controlled or restrained with an insulated hot stick while using Voltage Tester to check elbows. Elbow must be properly parked when bushing is being checked.

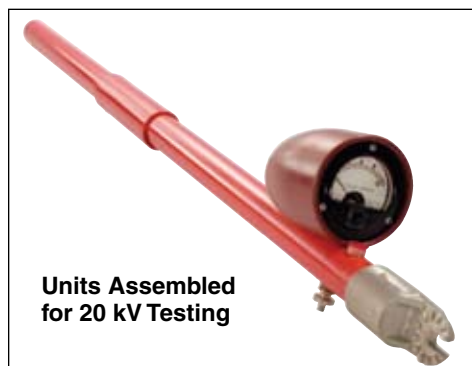
C4031369
for 0 - 10 kV



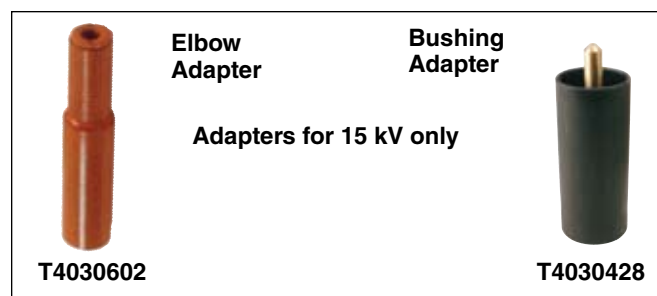
To check tester's condition before and after each use, test-point jack in front of meter accepts plug-in lead of Voltmeter Tester (see page 2453).



C4031367



**Units Assembled
for 20 kV Testing**



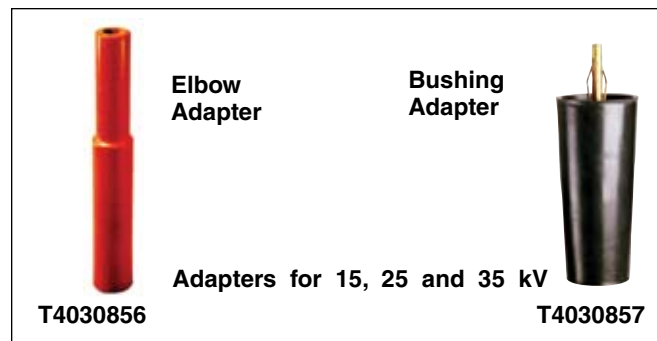
**Elbow
Adapter**

**Bushing
Adapter**

Adapters for 15 kV only

T4030602

T4030428



**Elbow
Adapter**

**Bushing
Adapter**

Adapters for 15, 25 and 35 kV

T4030856

T4030857

| Catalog No. | Description |
|-------------|---|
| C4031367 | Complete Voltage Tester for 20 kV 0-G includes Tester, Extension Resistor, Case and Instruction Booklet |
| C4031368 | 1 Extension Resistor |
| C4031369 | Voltage Indicator 10 kV 0-G with Case and Instruction Booklet |
| T4030602 | Elbow Adapter for 8.3/15 kV only |
| T4030428 | Bushing Adapter for 8.3/15 kV only |
| T4030856 | Elbow Adapter for 15, 25 & 35 kV |
| T4030857 | Bushing Adapter for 15, 25 & 35 kV |

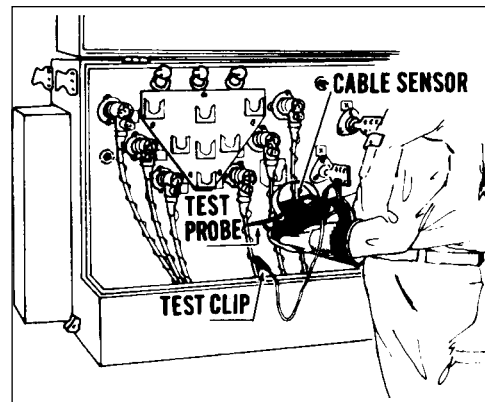
Energized Cable Sensor

The purpose of the Energized Cable Sensor is to allow the lineman to readily determine whether a URD cable is energized or de-energized.

The sensor consists of an amplifier which is designed to give a meter reading when the small AC voltage between the semi-conductive sheath and the concentric neutral of the energized URD cable is applied to the test probe. The amplifier is housed in a rugged thermoplastic case.



A self-test contact point is located on top of the amplifier housing. By touching the test probe to the test point, the meter operation and condition of the batteries can be verified.



Sensor may be used to check for energized condition on concentric-neutral cable below an elbow without test points (as above).

At cable mid-span (left), hose clamps bridge all strands of concentric neutral at the test location. Sensor's neutral lead clips to one of the hose clamps. Tip on probe lead contacts only semi-conductive cable sheath to test for voltage presence.

| Catalog No. | Description | Weight |
|-------------|---|---------------|
| C4030803 | URD Cable Sensor; two leads, two hose clamps, two 9-volt batteries and instructions | 5 lb./2.3 kg. |



Dielectric Compound No. 7

Dielectric Compound No. 7, a silicone base material, is made for use with load break disconnects and other electrical connecting and terminating devices.

Cat. No. C4170287 2 oz. Tube

Line Fault Locator

The device is for use on underground distribution lines, 115 volts through 34.5 kV, with fault location potential up to one megohm.

The Chance Line/Fault Locator consists of four units.

The Line Locator is made of Epoxiglas and is self-standing for free use of both hands. It is used as a "wand", sending a null-out to the audible sound through the unit as an indication of proximity to induced current in a buried cable.

The Fault Locator, also made of Epoxiglas, is designed to receive a signal from the transmitter through the two earth probes, interrupting the signal when the two probes are equidistant from the fault: 90° locations are then established from the handle of the tool to pinpoint the fault.

The Transmitter emits a 90-volt square wave, 115-cycle signal and is complete with one 12-volt battery installed in the carrying case.

The Receiver amplifies the signal of the Transmitter and/or the 60-cycle field around a conductor carrying current; includes six "AA" 1½-volt batteries, volume control and neck strap. Earphones are available for plugging into the receiver, eliminating background noises.



Complete Line/Fault Locator (Cat. No. C4030547)



Locating the buried cable (Cat. No. T4030572)



Locating the fault.

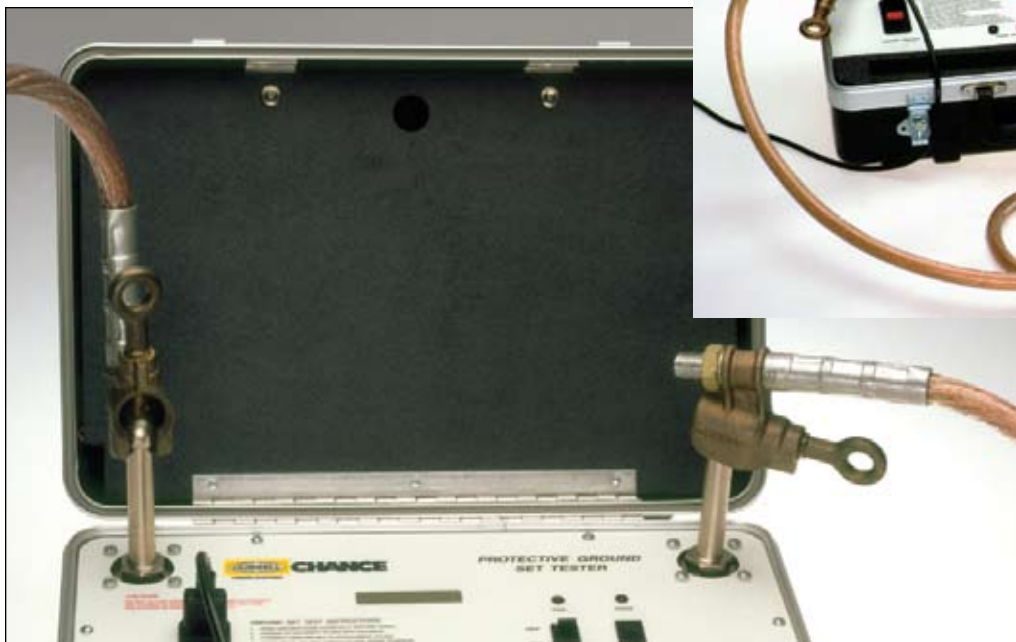
| Catalog No. | Description | Approx. Wt. |
|-------------|---|-----------------|
| C4030547 | Line/Fault Locator, complete with Batteries | 30 lb./13.5 kg. |
| T4030572 | Line Locator and Receiver only | 10 lb./4.5 kg. |
| T4030573 | Earphone Head Set | 1 lb./.45 kg. |

Protective-Grounding-Set Tester

- U.S. Patent 5,811,979
- Meets ASTM Standard F 2249
- Microprocessor technology for easy, accurate diagnostics

Self-contained, portable convenience

This tester provides an easy way for an electric utility to check the resistance in protective grounding sets used by line personnel. Powered by 120 VAC, the tester applies Direct Current across the test specimen. A seven-minute videotape, included with each unit, shows how simple the tester is to use. Procedure details are given in the instruction manual. All components store in the tester's integral carrying case.



Simple, one-button testing

From pushing a single button, the digital display shows the resistance measured in milliohms compared with a preset threshold for the size grounding cable selected (#2, 1/0, 2/0 or 4/0). A green "Pass" or red "Fail" light also indicates the test result's relation to the threshold.

For system-specific requirements, the user can easily change the Tester's basis for voltage allowed across a lineworker, which comes factory preset at 50 Volts. Adjusting this limit automatically causes a corresponding shift in the resistance thresholds for all the grounding cable sizes.

Regardless of the voltage-allowed setting or cable size selected, the Tester displays the resistance of each specimen in milliohms with $\pm 1\%$ accuracy, from 1 micro-ohm to 6.5 ohms.

The utility must establish the maximum resistance allowed for protective grounding sets used on each specific area of its systems. How the utility calculates these values depends on several factors outlined in the Tester instructions. Sample calculations with reference tables and charts are given in the manual.

Troubleshooting mode

If a ground set does not pass the initial test, the Tester can help isolate the problems. Often, the source of high resistance can be remedied by simple repairs to the cable set. Retesting then can quickly verify the effects of repairs.

For this troubleshooting mode, a pair of test probes are furnished to plug into the Tester. A switch activates them instead of the ball-stud terminals. The probes then are used to test across each contact interface in the ground set. The results display in milliohms, just as in the first test mode.

Optional terminals for special ground sets

The Tester's standard ball-stud terminals accept most types of ground clamps, including Chance ball-socket clamps.

To test special-application grounding sets for underground-distribution transformers or switchgear, two optional adapters shown below are available as separate items.

Protective-Grounding-Set Tester

- U.S. Patent 5,811,979 • Microprocessor technology for easy, accurate diagnostics
- Meets ASTM Standard F 2249



Optional Straight Stud Terminal T4033159 for testing grounded-parking-stand temporary grounding sets.



Optional Elbow Adapter C4033449 for testing temporary grounding sets fitted with a grounding elbow.

Ordering Information

Included with each Protective-Grounding-Set Tester:

- Self-contained carry case
- Instruction manual
- 2 Ball-stud terminals
- 2 Troubleshooting probes
- 1/2" VHS demo videotape
- Self-test cable

| Catalog No. | Description | Weight |
|-------------|------------------------------|-----------------|
| C4033220 | Protective-Ground-Set Tester | 17 lb./7.65 kg. |

Optional Adapters:

| | | |
|----------|------------------------|-------------------|
| T4033159 | Straight Stud Terminal | 3/4 lb./0.225 kg. |
| C4033449 | Elbow Adapter | 1 lb./0.45 kg. |

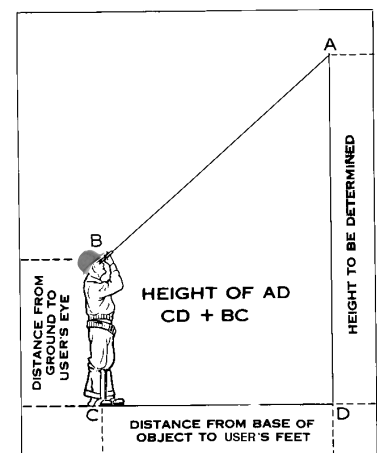
Complete
Protective
Ground-Set
Tester
Catalog No.
C4033220.



Chance Teleheight

This handy little instrument helps to figure quickly and accurately the heights of poles, trees, buildings or conductor clearance. A lineman can be taught in a few minutes to use it. The diagram at left shows how it works. Sight point A through the Teleheight and move backward or forward until the bubble centers on the hair line, which will be point C. Measure distance from C to D and add distance BC to find correct height. Leather case (2 1/4" x 4 1/4") had belt loop.

| Catalog No. | Description | Weight |
|-------------|------------------------------------|-------------------|
| CW | Teleheight Complete w/Leather Case | 1 1/4 lb./0.6 kg. |



LoadLooker Ammeter • U.S. Patent 5,057,769

- Models for Distribution, Transmission and Substation uses
- Hold feature for easy hotstick use

User-friendly electronic-loop design

Instead of you manipulating a hinged or clamp-type inductive pick-up, the patented LoadLooker electronically closes the loop for you. Its unique U-shape jaw senses the amperage present between its tines. The open-end design lets you check loads on components not accessible by other hot-line ammeters.

Live-line-ready hotstick mount

A standard fitting on the LoadLooker lets it mount on your insulated hotsticks just as any other universal tool. Your hot-line crews can begin using it immediately, in compliance with prescribed safe-working clearances for your system voltages.



LoadLocker Ammeter

• U.S. Patent 5,057,769

Simple pushbutton operation, direct-reading accuracy

A single button controls the operation. Push it once to turn on the LoadLocker. Push it a second time and LoadLocker will display the word HOLD and continue to display the next reading it "sees" until you push the button to clear it. This lets you bring it down from the line to eye level to read it.

After five idle minutes, the unit will itself turn off or you can manually turn it off by keeping the button depressed for five seconds. A detailed Operators Manual and storage case are included with each LoadLocker.

Rugged, application-specific design

Materials selected for the LoadLocker and how it is constructed are designed for the rigors of field conditions. Typical applications include identifying load imbalances, verifying the accuracy of current transformers, determining load to select properly sized jumpers, and measuring load before opening switches.

General Specifications

| | |
|------------------------------|---|
| LCD | 3½-digit display of Amps, Hold, Low Battery |
| Battery | 9 volt alkaline (included) |
| Accuracy | ±1% +2 Digits |
| Frequency | 50 or 60 Hertz |
| Operating Temperature | -30° to 60° C (-22° to 140° F) |
| Display Range | Automatic Ranging: 0 - 99.9 Amperes, in 0.1-Amp increments. 100 - 1999 Amperes, in 1.0-Amp increments. 2000-5000 Amperes, in 0.1kA Amp increments. |

Operators Manual and Soft Case included

Ordering Information

60 Hertz unit, Soft Case and Operators Manual

| Catalog No. | Max. Voltage (Ø-Ø) | Max. Current | Reading Type | Jaw Size | Weight |
|-------------|--------------------|------------------|--------------|----------|--------------------|
| MEAMP11RW | Up to 69 kV | Up to 2,000 amps | True RMS | 3.86" | 3.1 lb. / 1.41 kg. |
| MEAMP21RW | Up to 400kV | Up to 2,000 amps | True RMS | 3.86" | 3.1 lb. / 1.41 kg. |
| MEAMP32RN | Up to 500kV | Up to 5,000 amps | True RMS | 2.50" | 3.1 lb. / 1.41 kg. |

50 Hertz unit, Soft Case and Operators Manual

| | | | | | |
|------------|-------------|------------------|----------|-------|--------------------|
| MEAMP32RN2 | Up to 500kV | Up to 5,000 amps | True RMS | 2.50" | 3.1 lb. / 1.41 kg. |
|------------|-------------|------------------|----------|-------|--------------------|

Replacement Cases (Soft case furnished with units above.)

| Catalog No. | Description | Weight |
|-------------|----------------------------------|---------------------|
| C4002561 | Soft Case for LoadLocker Ammeter | 11.2 oz. / 0.32 kg. |
| C4002559 | Hard Case for LoadLocker Ammeter | 5.5 lb. / 2.5 kg. |



Wet/Dry Hot Stick Tester

• U.S. Patent No. 5,684,405

for easy, portable compliance with industry standards

Controls and meter for all requirements

Simple to operate, this portable unit makes easy work of testing insulated live-line tools. It features wet and dry modes selected by a toggle switch and follows procedures specified by ASTM, IEEE and OSHA. Its graduated meter gives precise readout of each tool's leakage current.

Portable operating ease

For testing any length fiberglass-reinforced plastic (FRP) hot stick up to 3 inches in diameter, the Wet/Dry Tester offers convenience for spot checks at field jobsites or periodic diagnostics in the workshop.



It's like having full-scale test setups for both Wet 75kV-per-foot and Dry 100kV-per-foot in a compact, self-contained unit easily carried and operated by just one person.

In the Setup procedure before each use, a zeroing knob is used to set the meter to zero without a tool in the tester. Then the furnished Check Bar is used as a self-check to make sure the tester is functional.

A seven-minute videotape included with each unit demonstrates "how-to" basics for Setup, Dry and Wet tests. The illustrated Owners Manual gives specifics which must be read and understood before operating the tester.



Ordering Information

Included with each Tester:

- Check bar • Owners operating instruction manual
- ½" VHS videotape demonstration • Carrying case

| Catalog No. | Wet/Dry Hot Stick Tester | Weight |
|-------------|--------------------------|----------------|
| C4033178 | 115-volt model | 20 lb./9.0 kg. |
| C4033179 | 230-volt model | 20 lb./9.0 kg. |



Quantitative test results

When the tester is placed on a tool, the meter displays any increase in leakage current due to the hot stick's presence. This gives an immediate indication of the stick's true leakage condition, independent of stray currents (through the air, internal to testers, etc.) zeroed out in advance.

The tester detects leakage currents due to surface contamination, internal moisture and such internal conductive materials as carbon tracks.



Ladder Monitor Kit for EHV Microamp Measurement on Barehand Equipment

The Chance Ladder Monitor Kit is used with EHV Barehand maintenance to detect microamp leakage on a ladder before it is placed into use. This is accomplished by connecting the meter to the ladder, and taking readings as the ladder is placed in contact with the conductor.

It is recommended that readings be taken periodically during work progress to assure proper or optimum working conditions which could be altered by a change in the atmosphere.

The kit consists of a 200 micro-amp scale microammeter, three clamps to effect use on a three-rail ladder, a cable with clips and adapter to establish contact, a bracket to ground and hold the meter on the structure and two dry cell batteries. Instruction drawings for field assembly and operating instructions are included in the kit.

| Catalog No. | Description | Weight |
|-------------|--------------------|-----------------|
| C4020288 | Ladder Monitor Kit | 7.5 lb./3.4 kg. |



Chance Sentinel Leakage-Current Monitor

To alert utility-line workers of overcurrent conditions on such aerial devices as insulated ladders and truck booms, the Chance Sentinel sounds an alarm if leakage current reaches a pre-set level. The leakage setting adjusts from 1 to 1,000 microamperes in resolution increments of 0.1 microamp.

The audible warning eliminates the need to watch the actual current level, continuously displayed on the Chance Sentinel's digital LCD screen. The alarm sounds immediately upon overcurrent and continues until the condition is corrected. To also trigger a truck horn or other external alarm, a jack on the instrument panel accepts a standard 1/4" two-conductor phone plug.

A test terminal on the panel permits a simple continuity check of the monitor leads prior to each operation. Before each use, the instrument automatically performs a rapid electronic self test. Simple operating steps are printed on the inside lid panel. A detailed instruction sheet also comes with each unit.

| Catalog No. | Description | Weight |
|-------------|---------------------|----------------|
| C4070025 | Chance Sentinel Kit | 9 lb./4.05 kg. |



Kit includes 1 coaxial cable and battery, plus 2 jumpers and 3 hose clamps for connections to two- or three-rail ladders. Brackets on box secure to an earth-grounded structure up to 5/8" thick such as a transmission tower.

Truck Boom Leakage-Current Monitor

For continuous performance this unit mounts on truck body and hardwires into truck's 12-Volt system which eliminates battery changeout.

To alert utility-line workers of overcurrent conditions on truck booms, this monitor sounds an alarm if leakage current reaches a pre-set level. The leakage setting adjusts from 1 to 1,000 microamperes in resolution increments of 0.1 microamp.

The audible warning eliminates the need to watch the actual current level, continuously displayed on the Chance Sentinel's digital LCD screen. The alarm sounds immediately upon overcurrent and continues until the condition is corrected.

To also trigger a truck horn or other external alarm, a jack on the instrument panel accepts a standard 1/4" two-conductor phone plug.

A test terminal on the panel permits a simple continuity

| Catalog No. | Description | Weight |
|-------------|----------------------------|----------------|
| T4070327 | Boom Monitor Kit (12 Volt) | 14 lb./6.4 kg. |

check of the monitor leads prior to each operation. Before each use, the instrument automatically performs a rapid electronic self test. Simple operating steps are printed on the inside lid panel. A detailed instruction sheet also comes with each unit.



Mounting studs on steel box bond directly to truck body.