

Operating Instructions for **CHANCE**[®]

Multi-Range Voltage Detectors

Catalog No.	Voltage
C403-0979	1 - 40 kV w/T.P.
T403-2271	1 - 40 kV w/T.P.
XT403-2633	5 - 120 kV
XC403-1029	16 - 161 kV w/T.P.
C403-1029	16 - 161 kV
T403-2293	69 - 345 kV
C403-1140	69 - 600 kV

CAUTION

The equipment covered by this instruction guide should be selected, installed and serviced by competent personnel who understand proper safety procedures. This instruction guide is written for such personnel and is not a substitute for adequate training and experience in safety procedures regarding this type of equipment.

This guide does not claim to cover all details or variations in equipment nor to provide for all possible conditions to be met with 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.

NOTICE

Before operating a Chance Multi-Range Voltage Detector, thoroughly read, understand and follow these instructions.

Retain these instructions in the device case.

WARNING

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.

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



POWER SYSTEMS, INC.

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210 N. Allen St.
Centralia, MO 65240 USA
Phone: 573-682-5521
Fax: 573-682-8714
<http://www.hubbellpowersystems.com>

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P403-2229
Rev. B

Basic Design and Function — all models —

To confirm that a line is de-energized prior to performing maintenance, the Multi-Range Voltage Detector (MRVD) presents field practicality over a voltmeter* and obvious advantages over traditional methods without a meter. Readings from an MRVD meter can be compared with numerical certainty rather than the subjective judgements associated with “fuzzsticking” or “glow-detecting.” In place of interpreting an arc’s intensity or the degree of brilliance from a neon light, the MRVD gives the operator a metered value.

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.

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 zero meter readings, when the line is actually energized, can result from both MRVD electrodes being at the same electrical potential. To avoid such field distortions, keep the MRVD as far away as practical from system components other than the specific conductor being tested.

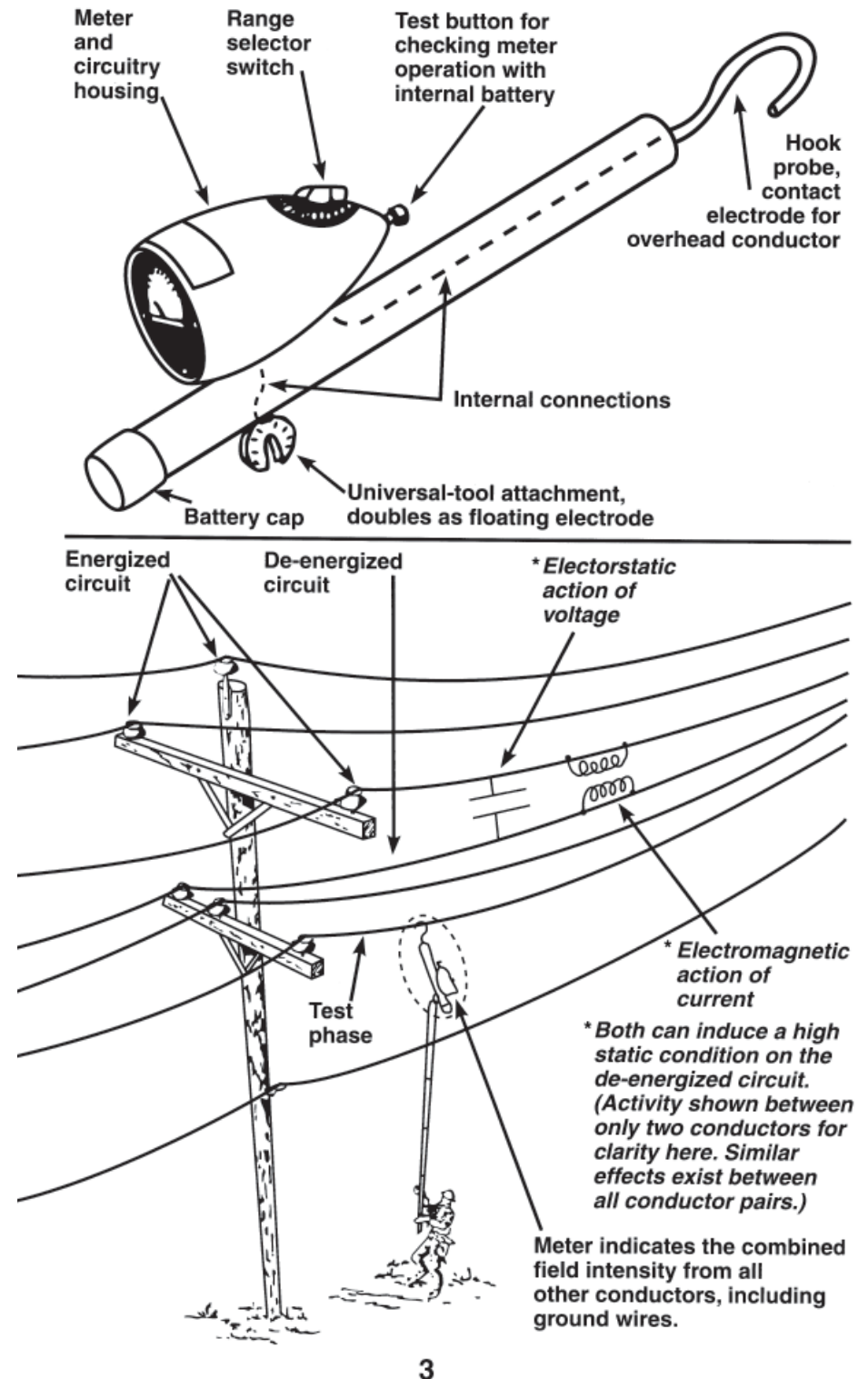
The MRVD should be used as a secondary means only to confirm the condition of a circuit after such principal work procedures as visual open gaps, dispatcher hold orders and apparatus tag-outs render the circuit de-energized.

*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 “dead” line to make the voltmeter reading actually exceed normal line voltage. Since it is not a voltmeter, no specific accuracy is claimed by the MRVD manufacturer or can be assumed by the user.

The MRVD is protected against voltages greater than its highest full-scale rating.

For authorized repairs, return to:

M.W. Bevins Company
9903 E. 54th St.
Tulsa, OK 74146-5718
Phone: (918) 627-1273
Fax: (918) 627-1294
WWW.MWBEVINS.CO.COM



Overhead Work Procedures — all models —

1 Check meter, battery and circuitry for proper operation before and after each use by depressing test button at back of meter housing while switching selection to each setting in sequence. Set at every position except "Off," meter should read nearly full scale. When reading falls three or four divisions below full scale, replace battery by removing plastic cap on end of mounting stick. Use a 9-Volt battery.

2 Thread hook probe into mounting-stick end fitting and attach MRVD to insulated hot stick of proper length for system voltage involved. Also set selector switch at correct voltage range.

NOTE: For voltages less than 1 kV, use MRVD as an indicator only with selector switch set at TP (Test Point) position – only on MRVD models C403-0979, T403-2271 and XC403-1029.

3 Contact hook probe to each conductor individually on three-phase circuits, following these guidelines:

- a. Keep mounting stick perpendicular to phase conductor.
- b. Keep MRVD away from pole or structure and associated equipment a **distance at least twice the circuit's phase spacing. That is, test out on span** rather than near structure, jumpers, risers, cutouts, insulators, ground wires and any system components other than conductor being tested.
- c. Test three or four locations to check consistency. **Where little or no consistency is apparent, consider the highest reading as correct.**

4 Multiply readings by the factor given at the switch position selected. (if readings are low on scale, set switch to next lower voltage range and repeat tests.)

Overhead Work Procedures — all models —

MRVD Interpretations

Reading x Multiplier	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. Do not assume anything; check circuit condition by another method.

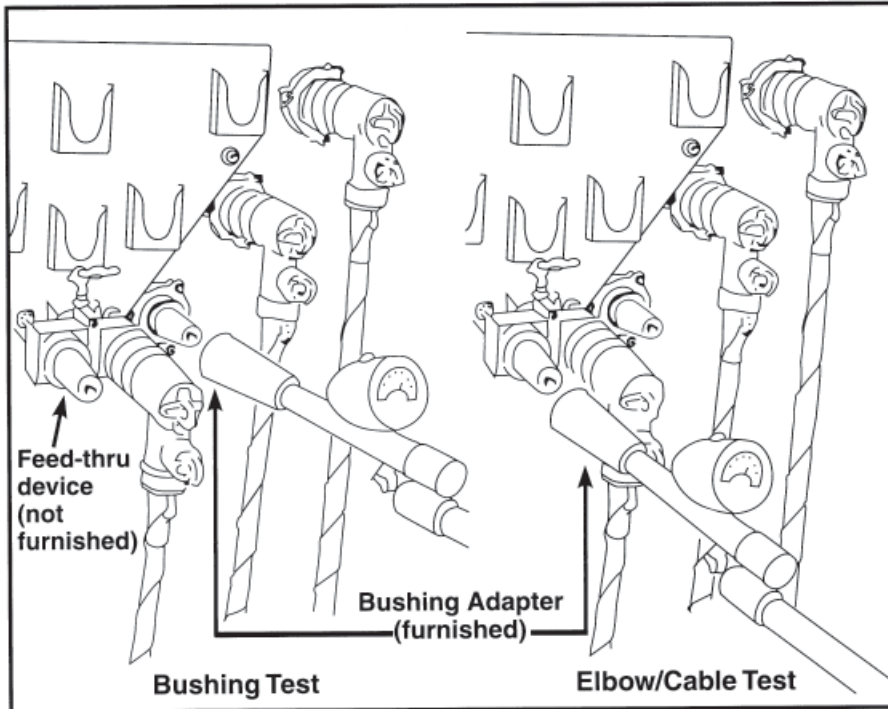
*All interpretations should take into account the circuit configuration, length, proximity to other lines; and should be consistent with previous experience on same circuit with this instrument. If in doubt about interpreting MRVD reading under any circumstances, **assume circuit is energized and take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



Underground Work Procedures (only MRVD model T403-2271)

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

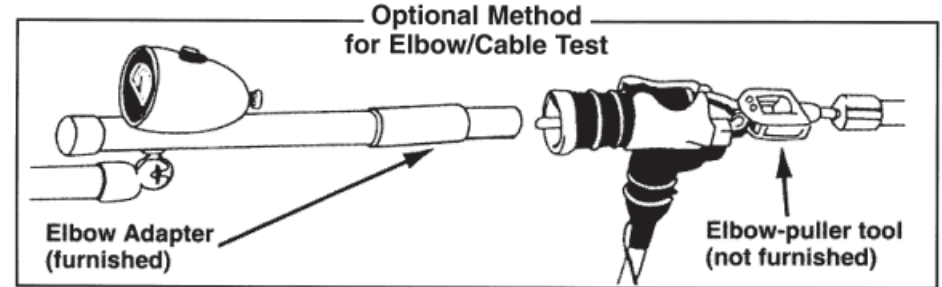
- 1 Check meter, battery and circuitry for proper operation before and after each use by depressing test button at back of meter housing while switching selection to each setting in sequence. Set at every position except "Off," meter should read nearly full scale. When reading falls three or four divisions below full scale, replace battery by removing plastic cap on end of mounting stick. Use a 9-Volt battery.
- 2 Thread bushing adapter into mounting-stick end fitting and attach MRVD to insulated hot stick of proper length for system voltage involved. Also set selector switch at correct voltage range.



- 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.

⚠ WARNING

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.



Optional method for 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 MRVD.

(Elbow adapter T403-0856 and bushing adapter T403-0857 furnished with MRVD model T403-2271.)

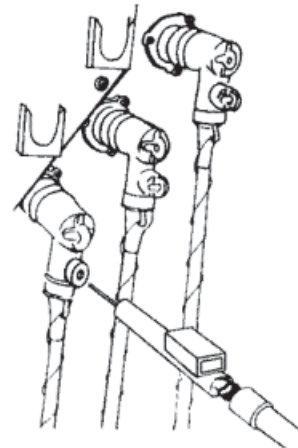
- 5 Multiply readings by the factor given at the switch position selected. (if readings are low on scale, set switch to next lower voltage range and repeat tests.)

MRVD Interpretations

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

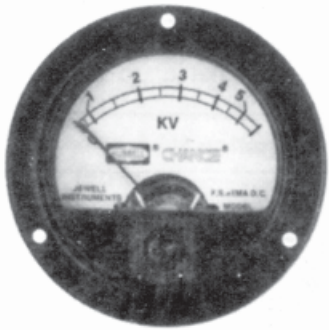
If in doubt about interpreting MRVD reading under any circumstance, assume circuit is energized and take appropriate safety precautions.

Elbow Test-Point Method (only MRVD models C403-0979, T403-2271 & XC403-1029)

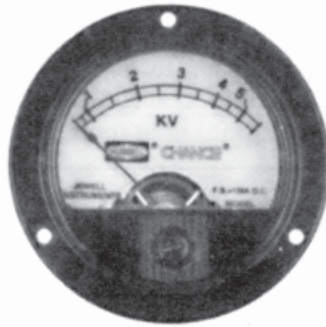


- 1 Same as Step 1 above. Do not skip this.
- 2 Thread straight probe into end fitting and mount MRVD on proper length hot stick. Set selector at "TP" position.
- 3 With hot-line tools, pull cap off test point* and contact it with probe.
- 4 Meter should read circuit condition. Any deflection, when set at the highly-sensitive "TP" position, indicates an energized condition.

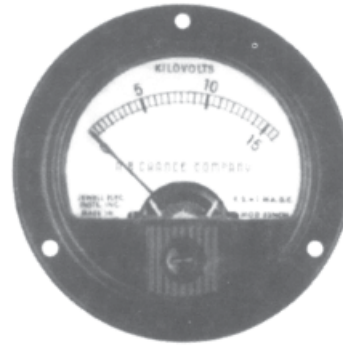
** Test point must be free of corrosion for test continuity.*



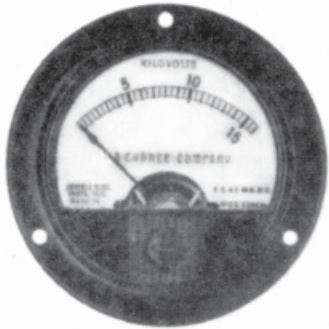
C403-0979
1 - 40 kV



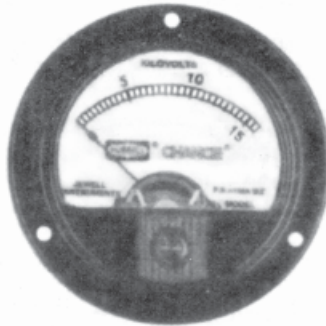
LIGHTED



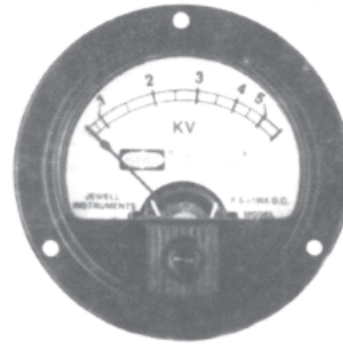
XC403-1029
16 - 161 kV



C403-1029
16 - 161 kV



LIGHTED



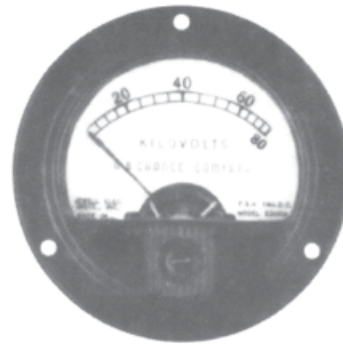
XT403-2633
5 - 120 kV



C403-1140
69 - 600 kV



LIGHTED



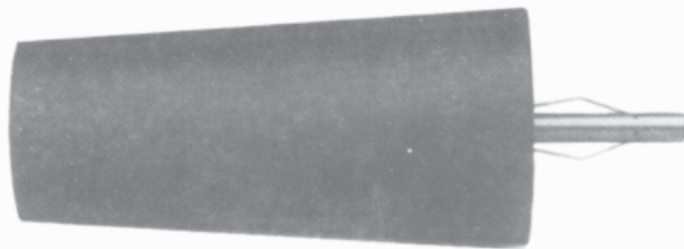
T403-2293
69 - 345 kV



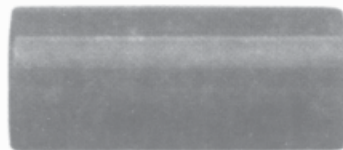
**T403-0856
UP TO 35KV Elbow Adapter**



**T403-0602
UP TO 15KV Elbow Adapter**



**T403-0857
UP TO 35KV BUSHING ADAPTER**



**T403-0428
UP TO 15KV BUSHING ADAPTER**

Cat No.	Description	Wt.
C403-0979	Multi-Range Voltage Detector Range 1 - 40kV, with Elbow test point setting, includes plastic case, hook, probe and instruction manual.	6.25 lbs
T403-2271	Multi-Range Voltage Detector Range 1 - 40kV, includes plastic case, hook, probe, T403-0857 Bushing Adapter, T403-0856 Elbow Adapter and instruction manual.	9 lbs
XT403-2633	Multi-Range Voltage Detector Range 5 - 120kV, includes plastic case, hook, and instruction manual.	6.25 lbs
C403-1029	Multi-Range Voltage Detector Range 16 - 161kV, includes plastic case, hook, and instruction manual.	6.25 lbs
XC403-1029	Multi-Range Voltage Detector Range 16 - 161kV, with Elbow test point setting, includes plastic case, hook, and instruction manual.	6.25 lbs
T403-2293	Multi-Range Voltage Detector Range 69 - 345kV, includes plastic case, hook, and instruction manual.	6.25 lbs
C403-1140	Multi-Range Voltage Detector Range 69 - 600kV, includes plastic case, hook, and instruction manual.	6.25 lbs
T403-0857	15 -34.5 kV Bushing Adapter	1.75 lbs
T403-0856	15 -34.5 kV Elbow Adapter	1 lbs
	Case (Plastic) For all Multi-Range Voltage Detectors.	4.25 lbs

All models except T403-2293 are available with lighted dials.