

Hastings Hot Line Tools

Voltage Phase Meters

Catalog Number 6702, 6702-A

6702 Digital Model



6702-A Analog Model



Instruction Manual

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SAFETY

- The Meter must only be used by trained personnel familiar with the use of such devices. This device is designed for use with high voltage which is lethal. Improper use may result in serious injury or death.
- Always follow OSHA and your company work procedures when using the Meter.
- Always use the Meter with an appropriate hot stick length for the potential being tested.
- The Meter startup self test is automatic. If the device does not complete the startup self test, do not attempt to use it. (See Page 6 Step 2.0).
- The body of the Meter will be at an elevated potential. Use caution when operating the Meter in the vicinity of grounded or energized objects.
- The Meter is only intended for operation on 50 Hz and 60 Hz AC power systems.
- Hi-Pot mode will only work with the Hi-Pot Adapter installed and with the Meter in Hi-Pot mode (see page 7).

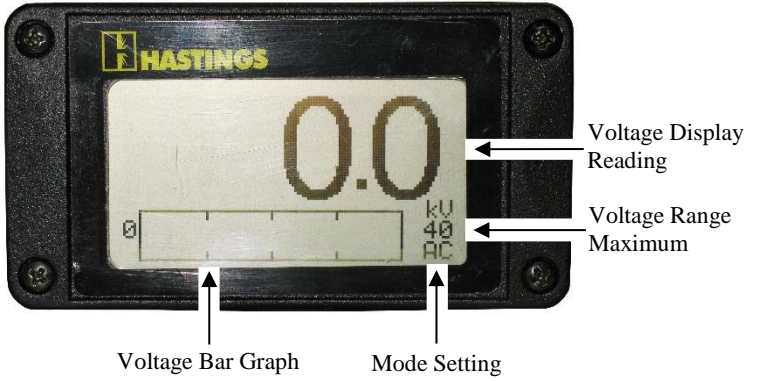
FEATURES

- Auto self test and battery voltage level check during startup.
- Large LCD display with backlight on/off function.
- Two modes of operation are available: AC and Hi-Pot (Hi-Pot Adapter must be installed to use in Hi-Pot mode, see page 7).
- Maximum value of voltage range is displayed.
- Long battery life from three “AA” batteries.
- High quality rugged extruded aluminum enclosure.

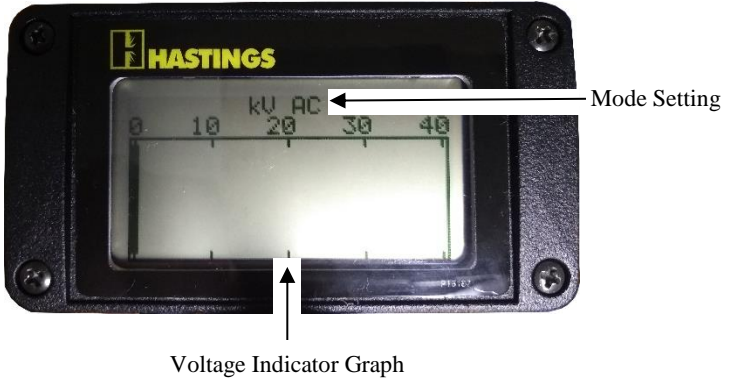
Top view of Meter



Front view of Meter: 6702



Front view of Meter: 6702-A



OPERATING INSTRUCTIONS

1.0 Prepare to Use

Remove the Meter from its storage case and inspect for damage.

The Meter consists of high voltage resistors encapsulated inside two fiberglass housings (sticks). These resistors are connected together with a coiled cord. An LCD display is attached to one of the encapsulated resistor housings. The Meter reads the current through the sticks to determine the voltage applied. Capacitive current between the cord and other objects will cause a slight reading in the Meter. This is most pronounced when both sticks are connected to the same phase and the cord allowed to hang below the tool. The reading should be zero since both ends are at the same potential, but because of the leakage current flow from the cord, there may be a small voltage indicated. This can be minimized by controlling the amount of slack cable (one method of controlling the slack cable is wrapping it around one of the Meter sticks). The connecting cord should be kept clear of any other objects.

Attach each encapsulated resistor to a hot stick of appropriate length for the voltages to be tested.

If the Meter is to be used on voltages of over 40 kV, the proper number of Extension Resistors (Cat. No. 6703) must be attached to probe ends of the encapsulated resistors. To attach Extension Resistors, remove probes from encapsulated resistors, attach Extension Resistors to encapsulated resistors, and re-assemble probes to end of Extension Resistors. The Extension Resistors are used in pairs, attaching one to each end of the Meter sticks. To determine number of Extension Resistors required, see

table below. Voltage range on the Meter will calibrate to correct voltage range during startup, if the ends of Extension Resistors remain in contact with each other during startup.

Number of Extension Resistor Pairs Required	Voltage Range
1	80 kV
2	120 kV
3	160 kV
4	200 kV
5	240 kV

Table 1: Extension Resistor Pairs for systems above 40 kV

2.0 Perform and observe “SELF-TEST” result

With the Meter turned off, press and release the ON/LIGHT/OFF button once to turn the Meter on and begin self-test. Before powering on, position the Meter to keep the probe ends in contact with each other.

- The Meter will perform self-test and battery voltage check.
- If the battery voltage is low, this will be displayed during the first screen of startup, by “Battery Voltage: Low”. Batteries must be replaced if this message is observed.
- The Meter defaults to AC mode when powered on. After passing the self-test, if the probe ends of the Meter are not connected, the Meter display will prompt for the probe ends to be connected, and press the MODE button. This will determine the number of Extension Resistors connected to the Meter. The Meter defaults to 40 kV.

3.0 Turn backlight on/off, select Mode of Operation

After the Meter is powered on, pressing and holding the ON/LIGHT/OFF button will turn on the backlight. Release ON/LIGHT/OFF once the backlight turns on. Pressing and holding ON/LIGHT/OFF again will turn the backlight off. Pressing and holding the MODE button will turn on the mode selection menu. With the mode selection menu on, pressing MODE will cycle through the available modes. Once the desired mode is selected, the Meter will return to the voltage reading mode.

Note: to use the Meter in Hi-Pot mode, a Hi-Pot Adapter must be installed (see page 7).

4.0 Contact Meter with voltage source

6702: When a potential is contacted by both probes, the resulting voltage will display numerically on the display, and also graphically on the voltage bar graph. If a voltage potential is contacted and the display flashes “++++”, the Meter has read a voltage higher than the allowable range.

6702-A: When a potential is contacted by both probes, the resulting voltage will be displayed by the moving indicator on the Meter display.

5.0 Accessories

As previously stated in Section 1.0, Prepare to Use, Extension Resistors must be used in conjunction with the Meter on systems above 40 kV. See section 1.0 for instructions on this procedure.

Underground bushing adapters for 35 kV Elastimold, and all 15 and 25 kV bushings (Cat. No. 6702-1), and for 35 kV RTE bushings (Cat. No. 6702-3) can be attached to the Meter by removing the supplied probe and replacing it with the appropriate adapter.

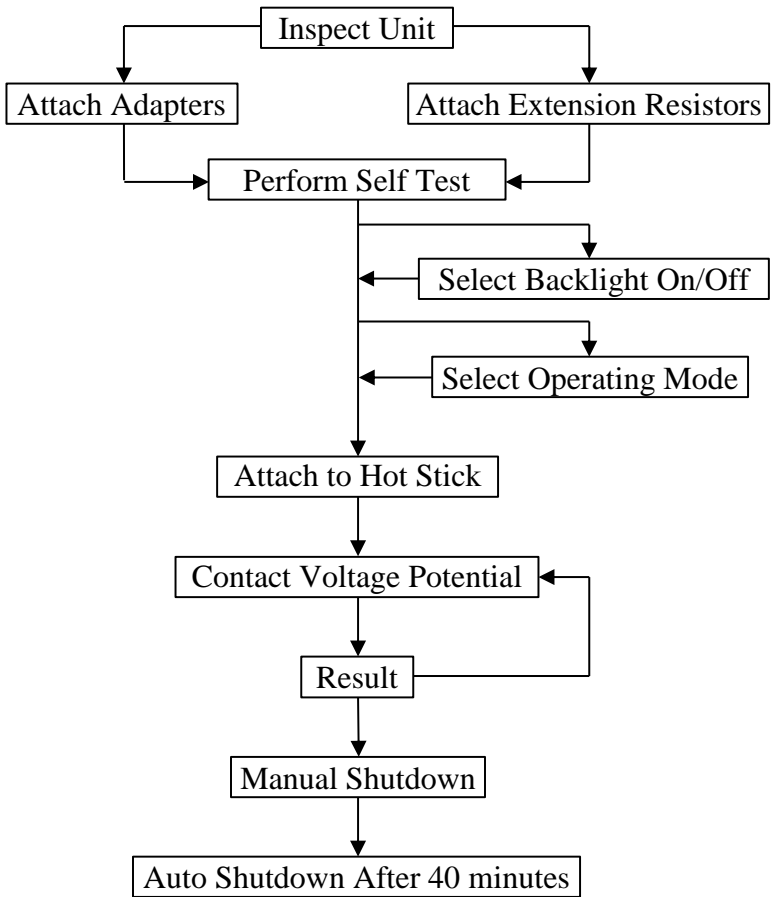
A DC Hi-Pot Adapter (Cat. No. 6702-2) is available which allows the testing of underground cable by rectifying the available system voltage and charging the cable to a DC voltage equal to the peak AC voltage supplied. While the DC voltage is high enough to test the cable, the current is limited by the Meter. In the event the cable is defective or grounds have been left on, fault currents will not result. Please see DC Hi-Pot instructions for operating the 6702 or 6702-A Meter with the DC Hi-Pot Adapter installed.

6.0 Shutdown

To turn the Meter off, press & hold the ON/LIGHT/OFF pushbutton until the display shuts off, indicating meter shutdown. The backlight will turn on during shutdown of the Meter.

The Meter will automatically shut down after 40 minutes if no voltage potential is detected.

Operating Instructions Flow Chart



BATTERY REPLACEMENT

The Meter uses three “AA” cells. These may be either Alkaline or NiMH.

The batteries are accessed by removing the back panel of the Meter.



TROUBLESHOOTING

Meter will not turn on.	Check batteries.
Incorrect voltage range is displayed for connected pairs of Extension Resistors.	Manually turn Meter off. Turn Meter back on, making sure free ends of Extension Resistors remain in contact with each other during self-test.
6702 only: during operation, the display flashes “++++”.	The Meter has read a voltage higher than the allowable range.

SPECIFICATIONS

Line Voltage Mode	0 – 40 kV AC
Operating frequency	50 – 60 Hz AC
Batteries	3 x 1.5V Alkaline or NiMH “AA”
Battery Life	24 hrs (backlight on continuously) 14 days (backlight off continuously)
Operating Temperature	-40°F to 122°F
Storage Temperature	-40°F to 158°F
Weight	3.8lbs (without probes) 4.0 lbs (with probes)
Accuracy*	AC Scale - 2% of the reading ± 1 **

* Accuracy is affected in the field by the proximity of other conductive objects in the vicinity of this Meter. Keeping the cord away from other objects will improve accuracy.

** Accuracy is given as [% of reading] \pm [number of least significant digits]

WARRANTY

HASTINGS warrants the catalog number 6702 and 6702-A Phase Meters to be free from manufacturing defects, for a period of one year from the date of purchase to the original owner. At the discretion of the company, units returned under this warranty shall be either repaired or replaced at no cost to the customer. This warranty will not apply to normal wear and tear or inappropriate use, alteration or abuse of the device.

For warranty or repair send units to:

HASTINGS Hot Line Tools
1301 W. Green St.
Hastings, MI 49058

Attn: Warranty Repair Department

For Enquiries or technical assistance call:

269-945-9541 or FAX 269-945-4623

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