Pt. No. 936752
9/96

OPERATING INSTRUCTIONS

for

AMPROBE®

Industrial Multimeter

Model AM-3E

- See PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION on page 2.
- See Limited Warranty on page 2.
- See page 5 for Fuse Protection.

AMPROBE.
A United Dominion Company

LIMITED WARRANTY

Congratulations! You are now the owner of an AMPROBE® instrument. It has been quality crafted according to quality standards and contains quality components and workmanship. This instrument has been inspected for proper operation of all of its functions. It has been tested by qualified factory technicians according to the long-established standards of AMPROBE INSTRUMENT.

Your AMPROBE instrument has a limited warranty against defective materials and/or workmanship for one year from the date of purchase provided that, in the opinion of the factory, the instrument has not been tampered with or taken apart. ***Should your instrument fail due to defective materials, and/or workmanship during the one-year warranty period, return it along with a copy of your dated bill of sale which must identify instrument by model number and manufacturing number.***

For your protection, please use the instrument as soon as possible. If damaged, or should the need arise to return your instrument, it must be securely wrapped (to prevent damage in transit) and sent prepaid via Air Parcel Post insured or UPS where available to:

Service Division
AMPROBE INSTRUMENT
630 Merrick Road (For U.P.S.)
P.O. Box 329 (For P.P.)
Lynbrook, NY 11563-0329

Outside the U.S.A. the local Amprobe representative will assist you. Above limited warranty covers repair and replacement of instrument only and no other obligation is stated or implied.

PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION

1) Read these instructions thoroughly and follow them carefully.
2) In many instances you will be working with dangerous levels of voltage and/or current; therefore, it is important that you avoid direct contact with any uninsulated, current-carrying surfaces. Appropriate insulating gloves and clothing should be worn.
3) Before connecting or disconnecting the meter to or from the circuit to be tested, turn off all power to the circuit.
4) Before applying test leads to circuit under test, make certain that leads are plugged into proper jacks and switches are set to proper range and function.
5) Before using any electrical instruments or tester for actual testing, the unit should be checked on a low energy high impedance source. **Do not use power distribution lines or any other high energy sources.**
6) Make certain no voltage is present in circuit before connecting ohmmeter to circuit.

IMPORTANT: Plug in only one accessory probe or set of test leads at any one time, except as directed.

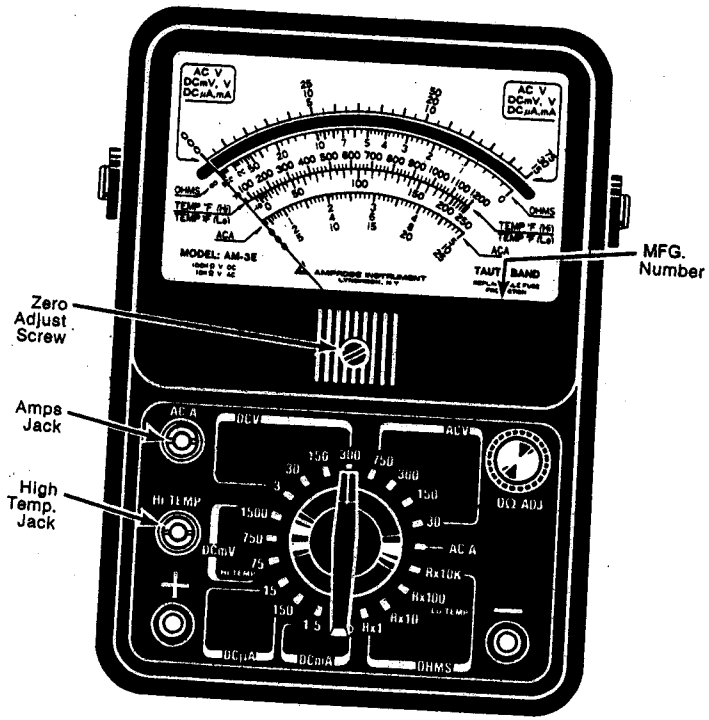

Fig. 1

Model AM-3E is supplied with MTL-2 all-weather test leads and MTC-3 alligator clip adaptors. All other accessories are available separately.

SPECIFICATIONS

VOLTAGE RANGES
AC: 0-30/150/300/750 (10,000Ω/volt)
DC: 0-3/30/150/300 (100,000Ω/volt)
15KVAC/DC ranges can be added through the use of the HV-2 High Voltage Probe and HVR-3 or HVR-3D Resistor.

RESISTANCE RANGES
0-500Ω with 5Ω midscale
0-5,000Ω with 50Ω midscale
0-50,000Ω with 500Ω midscale
0-5 megohms with 50,000Ω midscale

CURRENT RANGES
DC: 0-10 µA
0-15/150 µA @ 300 mV
0-1.5/150 mA @ 300 mV
AC: 0-5/25/100/250 amps
with Current Transducer A603 (60Hz) or A653 (50Hz)
0-0.5/2.5/10 amps
with A603 or A653 and Energizer A47-L
0-50/1000/1200 amps
with A603 or A653 and Deca-Tran® A50-1
0-1250/5000/6000 amps
with A603 or A653 and Amptran® CT50-1 or CT50-2
0-10/50/250/500 amps
with Current Transducer A703 (60Hz) or A753 (50Hz)
0-1/5 amps
with A703 or A753 and Energizer A47-L
0-100/1200 amps
with A703 or A753 and Deca-Tran® A50-1
0-2500/6000 amps
with A603 or A653 and Amptran® CT50-1 or CT50-2

MILLIVOLT RANGES
0-75/750/1500mVDC @ 10µA
0-300mVDC

TEMPERATURE RANGES
Low: −10°F to +250°F
with probe RBT-11B or RBT-12B or RBT-13B (for non-corrosive applications). RBT-13B should not be used in temperatures above 150°F.
High: +70°F to +1200°F with probe TC-3.

ACCURACY

DC:	±3% F.S.	*Resistance:*	±3% of arc
VAC:	±4% F.S.	*Low Temperature:*	±3% of arc including probe.
Amperes AC:	±5% F.S.	*High Temperature:*	±3% F.S. including probe.

OHMMETER POWER SUPPLY
Uses two "C" batteries in parallel.

CIRCUIT PROTECTION
One #8AG-361 1 amp fast blow.
One #3AG-312 0.1 amp fast blow.
Do not substitute fuses as resistance can vary.

ACCURACY

1) For greatest accuracy, the pointer should be set on the zero line. Use zero adjusting screw, if necessary.
2) When using meter, place it panel side up on a flat non-metallic surface.
3) Take a reading on the range on which the reading is as close to full scale as possible.

OPERATION

Before using instrument, read "Precautions for Personal and Instrument Protection" on page 2.

DC/AC Voltage Ranges
All voltage measurements are read on the 15/30/75 scale and an appropriate multiplying or dividing factor applied (see paragraph 6 AC Voltage and DC Voltage Measurement below) when the selector switch is set on a range other than those appearing on the scale.

AC Voltage Measurement
1) Set the selector switch to appropriate AC voltage range. When voltage is unknown, use the highest voltage range.
2) Plug the Black test lead into the "−" jack.
3) Plug the Red test lead into the "+" jack.
4) Place one test prod on each side of the AC voltage.
5) If meter indication is in lower half of scale and falls within the range of a lower scale, reset selector switch to the lower range.

6)

Range VAC	Read on Scale	Multiply (×) Reading By
0-30	0-30	x1
0-150	0-15	x10
0-300	0-30	x10
0-750	0-75	x10

For 15KVAC, see page 4 and instructions on page 6.

DC Voltage Measurement

1) Set the selector switch to appropriate DC voltage range. When voltage is unknown, use the highest voltage range.
2) Plug the Black test lead into the "–" jack.
3) Plug the Red test lead into the "+" jack.
4) If Negative and Positive sides of the circuit to be tested are known:
   a) connect the Black test prod to the Negative side of the circuit.
   b) connect the Red test prod to the Positive side of the circuit.
   If the Negative and Positive sides of the circuit are not known:
   a) connect the Black and Red prods to the circuit.
   b) if meter deflects to the left reverse the Black and Red prods.
5) If meter indication is in lower half of scale and falls within the range of a lower scale, reset selector switch to the lower range.

6)

Range	Read on Scale	Multiply (×) Or Divide (÷) Reading By
0-3VDC	0-30	÷10
0-30VDC	0-30	× 1
0-150VDC	0-15	×10
0-300VDC	0-30	×10
0-75mV	0-75	× 1
0-300mV*	0-30	×10
0-750mV	0-75	×10
0-1500mV	0-15	×100

For 15KVDC, see page 4 and instructions on page 6.

**This range is achieved by setting the range selector switch to the O-15μA range, take readings on O-30 scale and multiply by 10.*

HIGH VOLTAGE PROBE (15KV)

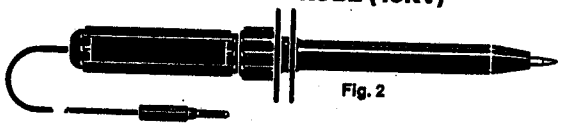

Fig. 2

1) To use accessory High Voltage Probe Model HV-2 with the AM-3E, unscrew handle from main probe and insert correct resistor (not supplied with probe) with the spring on the resistor toward handle.
   a) For 15,000VDC, use Resistor No. HVR-3D
   b) For 15,000VAC, use Resistor No. HVR-3
2) Screw handle back onto probe.
3) Set range switch to 150VAC or 150VDC range.
4) Plug instrument's black voltage test lead into "–" jack on AM-3E and fasten other end of lead to "ground" of circuit being tested.
5) Plug HV-2 Probe (with correct resistor installed) into "+" jack.
6) With your hand behind the protective discs on the handle of the probe, touch the probe tip and the circuit under test.

7) Take the reading on the O-15 scale and multiply reading by 1000.
NOTE: Tip of HV-2 Probe is replaceable.

DC Current Measurement

A milliampere is one thousandth (1/1000) of an ampere and may be written as 1mA or 0.001 ampere.
A microampere is one millionth (1/1,000,000) of an ampere and may be written as 1μA or 0.000001 ampere.
Meter must be connected in series with the circuit under test.
All DC current measurements are read on the 15/30/75 scale and an appropriate multiplying or dividing factor (see paragraph 7 below) applied, when the selector switch is set on a range other than those appearing on the scale.

1) Set the selector switch to appropriate range. When current is unknown use the highest current range.
2) Plug Black test lead into the "–" jack.
3) Plug Red test lead into the "+" jack.
4) Using the Red and Black test leads connect the meter in series with the circuit under test.
5) If meter deflects to the left, reverse the Red and Black test prods.
6) If meter indication is in lower half of scale and falls within the range of a lower scale, reset selector switch to the lower range.

7)

Range	Read on Scale	Multiply (×) Or Divide (÷) Reading By
0-10μA*	0-30	÷3
0-15μA	0-15	×1
0-150μA	0-15	×10
0-1.5mA	0-15	÷10
0-150mA	0-15	×10

**This range is achieved by setting the range selector switch to the 0-750mV range, taking readings on 0-30 scale and dividing by 3.*

AC Current Measurement

AC Current can be measured using a clamp-on current transducer available separately as an accessory. All AC current measurements are read on the 5/10/25 AC Amps scale and an appropriate multiplying or dividing factor applied (See paragraphs 5 and 6 below) when the range selector switch on current transducer is set on a range other than those appearing on the scale or when a range-extending accessory (A-47L, A-47CL, A50-1, CT-50-1/2) is also used.

1) Set the selector switch to AC A position.
2) Plug current transducer into AC AMPS jack.
3) Set range selector switch in base of current transducer to desired range. If current is unknown use the highest current range.
4) If meter indication is in lower half of scale and falls within the range of a lower scale, reset range selector switch to the lower range.

MODEL A603 OR A653 CURRENT TRANSDUCER RANGES:

AC Amps Range	Read on Scale	Multiply (×) Reading By
0-5	0-5	×1
0-25	0-25	×1
0-100	0-10	×10
0-250	0-25	×10

a) The **Energizer A-47L** or **A-47CL** can extend the current measuring sensitivity of the **A603/A653 transducers** as follows:

A603/A653 Range Switch Position	Use Energizer Loop	Read On Scale	Multiply (×) Or Divide (÷) Reading By	Effective Range
0-5	10×	0-5	÷10	0-0.5
0-25	10×	0-25	÷10	0-2.5
0-100	10×	0-10	×1	0-10

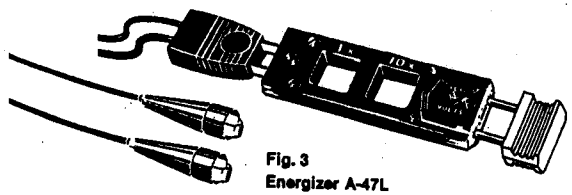

Fig. 3
Energizer A-47L

b) The **Deca-Tran® A50-1** can extend the current measuring capability of the **A603/A653 transducers** as follows:

A603/A653 Range Switch Position	Read on Scale	Multiply (×) Reading By	Effective Range
0-5	0-5	×10	0-50
0-100	0-10	×10	0-1000*
0-250	0-25	×10	0-1200*

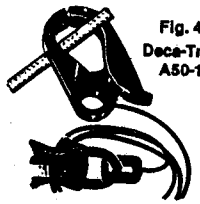

Fig. 4
Deca-Tran A50-1

**The Deca-Tran A50-1 has a maximum rating of 1200 amperes intermittent duty, 600 amperes continuous duty.*

c) The **Amptran® CT50-1** can extend the current measuring capability of the **A603/A653** transducers as follows:

A603/A653 Range Switch Position	Read On Scale	Multiply (×) Reading By	Effective Range
0-25	0-25	×50	0-1250
0-100	0-10	×500	0-5000
0-250	0-25	×500	0-6000*

**The Amptran CT50-1 (six-link) has a maximum rating of 6000 amperes intermittent duty, 5000 amperes continuous duty. The CT50-2 (four-link) also multiplies ranges by 50 times to a maximum of 3,600 amperes intermittent duty, 3,000 amperes continuous duty.*

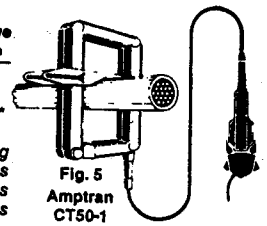

Fig. 5
Amptran CT50-1

MODEL A703 OR A753 CURRENT TRANSDUCER RANGES:

AC Ampere Range	Read On Scale	Multiply (×) Reading By
0-10	0-10	×1
0-50	0-5	×10
0-250	0-25	×10
0-500	0-5	×100

a) The **Energizer A-47L** or **A-47CL** can extend the current measuring sensitivity of the **A703/A753 transducers** as follows:

A703/A753 Range Switch Position	Use Energizer Loop	Read On Scale	Multiply (×) Or Divide (÷) Reading By	AC Amp Effective Range
0-10	10×	0-10	÷10	0-1
0-50	10×	0-5	×1	0-5

b) The **Deca-Tran A50-1** can extend the current measuring capability of the **A703/A753 transducers** as follows:

A703/A753 Range Switch Position	Read On Scale	Multiply (×) Reading By	AC Amp Effective Range
0-10	0-10	×10	0-100
0-250	0-25	×100	0-1200*

**The Deca-Tran A50-1 has a maximum rating of 1200 amperes intermittent duty, 600 amperes continuous duty.*

c) The **Amptran CT50-1** can extend the current measuring capability of the **A703/A753 transducers** as follows:

A703/A753 Range Switch Position	Read On Scale	Multiply (×) Reading By	AC Amp Effective Range
0-50	0-25	×100	0-2500
0-250	0-25	×500	0-6000*

**The Amptran CT50-1 has a maximum rating of 6000 amperes intermittent duty, 5000 amperes continuous duty. The CT50-2 also multiplies ranges by 50 times up to 3,600 amperes intermittent duty, 3,000 amperes continuous duty.*

RESISTANCE MEASUREMENTS

(See operating precautions on page 2)

All resistance measurement readings are taken on the OHMS scale. The ohmmeter portion of the meter is powered by two 1.5V type "C" batteries. To install the batteries, remove instrument back cover by moving latch up and prying cover up with screwdriver (Fig. 6). Remove old batteries and replace with new "C" batteries, observing the proper polarity. To replace back cover, line up bottom edges and snap into place.

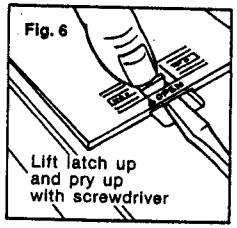

Fig. 6

1) Set the selector switch to appropriate range.
2) Plug the Black test lead into the "−" jack.
3) Plug the Red test lead into the "+" jack.
4) Short the test leads by touching them together.
5) With leads shorted together observe pointer. It should read "0" at the right hand end of the OHMS scale.
6) If pointer does not indicate "0", use ohmmeter zero adjust knob to line up with "0" on OHMS scale. If pointer cannot be brought up to "0", replace batteries.
7) Separate the test leads.
8) Connect test leads across the resistance to be measured. Caution: Resistance to be measured must be disconnected from all power before applying ohmmeter test leads.
9) Take reading on OHMS scale and multiply reading by the multiplication factor indicated by the selector switch RX1, RX10, RX100 or RX10K.
10) If there is little or no pointer deflection from "Infinity" (∞ lefthand end of scale), reset selector switch to a higher range in an effort to get a greater deflection. The best readability on an ohmmeter range is between midscale and zero ohms. Note: When switching ranges, readjust pointer to "0" ohms as outlined above. When resistance is unknown, start with the highest resistance range (RX10K).

Note: When checking semi-conductor devices, the ohmmeter test voltage polarity is opposite of that indicated by the test jacks on the instrument, e.g., the black lead in the "−" jack will be positive.

TEMPERATURE MEASUREMENTS

(See operating precautions on page 2)

A. Temperatures of −10°F to +250°F may be measured directly with the Model AM-3E by using a temperature probe (Cat. No. RBT-11B, RBT-12B or RBT-13B*) which is available separately as an accessory item. *RBT-13B Probe should not be used in temperatures above 150°F as probe housing cannot withstand higher temperatures.

1) Set range switch to RX100 range (Lo Temp).
2) Insert voltage test leads into the "−" and "+" jacks.
3) Short the test leads by touching the tips together.
4) With leads shorted together observe pointer. It should indicate "0" at the right hand end of the *OHMS* scale.
5) If pointer does not indicate "0", use ohmmeter zero adjust knob to line up pointer with "0" on *OHMS* scale. If pointer cannot be bought up to "0", replace batteries.
6) Remove voltage test leads.
7) Insert temperature probe plugs into "+" and "−" jacks.
8) Place temperature probe tip in area where a temperature is to be measured.
9) Read temperature on black temperature scale (−10°F to +250°F) after meter indication appears to be stabilized.

B. Temperatures of +70°F to +1200°F may be measured directly with the Model AM-3E by using Thermocouple Cat. No. TC-3 which is available separately as an accessory item.

1) Set range switch to 75mVDC range (Hi Temp) position.
2) Before plugging in thermocouple, adjust meter pointer to room temperature on the temperature scale. This is done by means of the "Zero" adjust screw.
3) Insert thermocouple plug into "Hi Temp" jack.
4) Place metal ferrule of the thermocouple lead in area where temperature is to be measured. Use accessory clip adaptor TC-C (not furnished) to fix location of thermocouple, if necessary.
5) Read temperature on black temperature scale (+70°F to +1200°F) after meter indication appears to be stabilized.

CIRCUIT PROTECTION

All ohms, millivolt and milliamp ranges are fuse protected or can withstand the misapplication of 220 volts for ½ minute. The 8AG-361 1 ampere fuse protects the RX1 ohmmeter and 150mA DC ranges. The 3AG-312 0.1 ampere fuse protects the RX10, RX100 ohmmeter, 1.5mA DC, 150μA and 75mV DC ranges. All other ranges can withstand 220 volts for a period of ½ minute.

To avoid loss of the use of your instrument because of a blown fuse, at least one replacement fuse of each type should always be kept with the instrument.

As an extra protection feature, if either of the two fuses are blown, only the Amps AC and two temperature ranges remain functional. The blown fuse must be replaced before all the other ranges become functional.

FUSE REPLACEMENT

If the meter fails to function on any range (except Amps AC and high temperature ranges) proceed as follows:

1) Remove back cover (see Fig. 6).
2) Remove both fuses and replace with new ones.
3) To replace back cover, line up bottom edges and snap into place.
4) If instrument still does not function on the desired range, the problem is elsewhere.

CARRYING CASES

Model MM-4 ever-ready case permits use of instrument while in the case for extra protection. Separate storage compartment can accommodate test leads, two temperature probes, and two current transducers.

Model MM-3 provides storage for instrument and one or two accessories.

SERVICE

Manufacturing number is die stamped in lower right hand corner of the scale plate.

For Factory service, package instrument and packing slip with sufficient cushioning material in a shipping carton; make certain your name and address also appear on box as well as packing slip; ship prepaid via U.P.S. (where available) or Air Parcel Post insured to:

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