TEGAM is a manufacturer of electronic test and measurement equipment for metrology, calibration, and production test. We also provide repair, calibration, and other support services for a wide variety of test and measurement equipment including RF power sensor calibration systems, RF attenuation measurement systems, resistance standards, ratio transformers, arbitrary waveform generators, micro-ohmmeters, LCR meters, handheld temperature calibrators, thermometers, humidity and temperature control devices, and more.

TEGAM also repairs and calibrates test and measurement equipment formerly manufactured by Electro-Scientific Industries (ESI), Gertsch, Keithley Instruments, Lucas Weinschel, and Pragmatic Instruments. A complete list can be viewed on our Product Service Directory at *www.tegam.com*.

For more information about TEGAM and our products, please visit our website at www.tegam.com; or contact one of our customer service representatives at sales@tegam.com or 800-666-1010.

Model 122

Instruction Manual

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This owner's manual was as current as possible when this product was manufactured. However, products are constantly being updated and improved. Because of this, some differences may occur between the description in this manual and the product you receive.

WARRANTY

TEGAM, Inc. warrants this product to be free from defects in material and workmanship for a period of one year from date of shipment. During the warranty period, we will at our option, either repair or replace any product that proves to be defective.

TEGAM, Inc. warrrants the calibration of this product for a period of one year from date of shipment. During this period we will recalibrate any product that does not conform to the published accuracy specification.

To exercise this warranty, contact TEGAM, Inc., Ten TEGAM Way, Genenva, Ohio 44041 / PHONE (440) 466-6100 / FAX (440) 466-6110, M-F, 8 a.m.-5 p.m. ET. You will be given prompt assistance and return instructions. Send the instrument, transportation prepaid, to the indicated service facility. Repairs will be made and the instrument returned, transportation prepaid. Repaired products are warranted for the balance of the original warranty, or at least 90 days, whichever is longer.

LIMITATION OF WARRANTY

This warranty does not apply to defects resulting from unauthorized modification or misuse of any product or part. This warranty also does not apply to fuses, batteries, or damage from battery leakage.

This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness for a particular use. TEGAM, Inc. shall not be liable for any indirect, special or consequential damages.

STATEMENT OF CALIBRATION

This instrument has been inspected and tested in accordance with specifications published by TEGAM, Inc.

The accuracy and calibration of this instrument are traceable to the National Institute of Standards and Technology through equipment which is calibrated at planned intervals by comparison to certified standards maintained in the Laboratories of TEGAM, Inc.

PROBE REPLACEMENT PROCEDURE CONTINUED

Next, remove the circuit board from the top case by unscrewing the hex spacer in the center of the board.

Use a small soldering iron (<45 watts) to remove the test-leads from the circuit board eyelets. Pull the old probes free of the Model 122 case.

Feed the test-leads of the replacement probes through the holes in the topcase, and solder into appropriate eyelets (red probe to (+) eyelet, black probe to (-). Install new tie-wraps (TEGAM P/N CC-38-4), and reassemble Model 122.

OPTIONAL ACCESSORIES

The following accessories are available for Model 122 Voltman. Contact TEGAM to order these.

Model 1104 utility belt carrying case (leather)
Model 1204 Lineman's case (Cordura)
Model 8668 Soft carrying case, (antique vinyl, brown)
Model 12501 Alligator Clip Adapter Kit
Model 12502 Universal Probe Tip Adapter Kit
Model 121-404 Replacement Probe/Lead Set

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SPECIFICATIONS

MODEL 122 SPECIFICATIONS

FUNCTIONS: VAC, VDC, and continuity with automatic selection. When both AC and DC input voltages are present, VAC function is selected if peak AC voltage is greater than magnitude of DC voltage. Otherwise, VDC function is selected. Continuity function is enable when peak (AC + DC) input voltage is 0 ± 500 mV (typ.).

RANGES: 750 volts AC, average responding, RMS calibrated.
± 750 volts DC.

RESOLUTION: 1 volt

ACCURACY:

VAC: ± (0.2% rdg + 1 volt), 50 - 60 Hz
± (0.5% rdg + 1 volt), 45 - 2,000 Hz, typ.

VDC: ± (0.2% rdg + 1 volt)

MAXIMUM INPUT: 750 volts continuous; 1,000 volts for 1 min.

INPUT RESISTANCE: 7,500 ohms typ. (PTC thermistor)

REJECTION OF CAPACITANCE-COUPLED INPUT VOLTAGE: Suppresses 1,000 pF of capacitive effect to less than 1 count at 120v/60 Hz.

CONTINUITY: Sensing current is 0.15 mA (typ.). Audible beeper and display decimal points (3) turn on when external probe-to-probe resistance is less than 4,000 ohms (typ.).

AUDIBLE BEEPER: Continuous tone with continuity. Pulsed tone with voltage readings above zero.

READING RATE: 2.5 readings/second.

FUNCTIONALITY CHECKS

1. CONTINUITY CHECK Slide the power switch to the ON position and touch the probe tips together. Display should indicate .0.0.0 VDC, while the audible beeper emits a continuous tone.
2. ZERO CHECK Disconnect probes from each other and all external circuits. Display should stabilize to read 000 VDC. Neither the beeper nor the backlight should turn on.
3. VOLTS Touch the black probe to the negative terminal of a fresh 9 volt transistor battery (alkaline or carbon-zinc) and touch the red probe to the positive terminal. A reading of 9-10 VDC should be displayed. The display backlight should turn on and the beeper should emit a pulsing tone. Reverse the probes. The same reading except for a minus polarity should be displayed.
4. AC VOLTS Connect Voltman-TRMS probes to the hot and neutral terminals of a standard 120 VAC power receptable. Under normal line conditions, a reading of 120± 10 VAC should be displayed. The display backlight should turn on and the beeper should emit a pulsing tone.

MAINTENANCE INFORMATION

This section contains information needed to maintain your instrument. The following information is included: probe replacement procedure, reducing turn-off delay, functionality checks, performance verification, and battery installation/replacement.

PROBE REPLACEMENT PROCEDURE

WARNING
Probe replacement to be done by Qualified personnel only.

CAUTION
Replacing Model 122 probes with anything other than a TEGAM P/N 121-404 probe set will reduce meter overload protection.

WARNING
Disconnect probes from external circuits and turn the instrument off before performing probe replacement. Reinstall the cover before resuming use of the instrument.

Open the Model 122 case and cut the strain relief tie-wrap securing the test-leads to the circuit board.

SAFETY PRECAUTIONS

The WARNING term used in this manual and on the instrument explains dangers that could result in personal injury or death.

WARNING

1. This instrument is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. Read over the manual carefully before operating this instrument.

2. Exercise extreme caution when a shock hazard is present at the instrument's input. The American National Standards Institute (ANSI) states that a shock hazard exists when voltage levels greater than 30V rms or 42.4V peak are present. A good safety practice is to expect that a hazardous voltage is present in any unknown circuit before measuring.

3. Inspect the test leds for possible wear, cracks or breaks before each use. If any defects are found, replace with P/N 121-404 probe/test set before using the intrument.

4. For optimum safety do not touch the test leads or the instrument while power is applied to the circuit under test. Turn the power off and discharge all capacitors before connecting or disconnecting the instrument.

5. Do not touch any objects which could provide a current path to the common side of the circuit under test or power line (earth) ground. Always make measurements with dry hands while standing on a dry, insulated surface capable of withstanding the voltage being measured.

6. Exercise extreme safety when testing high energy power circuits (AC power lines, etc.).

7. Do not exceed the instrument's maximum allowable input as defined in the specifications and printed on the front panel of the instrument.

8. Fundamental safe work practices recommend testing any voltmeter on a known low-energy source before and after each use.

DISPLAY: 0.5" LCD (3.5 digits) with annunciators for polarity, VAC, VDC, overload and low-battery. LED backlight turns on automatically with voltage readings above zero.

INPUT PROBES: Color-coded with shock collars and retracting tip-sheaths. PVC insulated leads, 36" long, strain-relieved and soldered into eyelets to permit replacement by meter-repair personnel.

ENVIRONMENTAL LIMITS FOR OPERATION: -10°F to 150°F, less than 80% R.H. up to 95°F. Reduce R.H. limit by 1.7% per °F above 95°F.

ENVIRONMENTAL LIMITS FOR STORAGE: -30°F to 150°F, less than 90% R.H. up to 95°F. Reduce R.H. limit by 1.7% per °F above 95°F.

ENVIRONMENTAL/TIME LIMITS TO ACCURACY: 64° to 82°F, 80% R.H., 1 year.

TEMPERATURE COEFFICIENT: From: 64° to 82°F; included in accuracy specifications. Below 64°F and above 82°F; less than 0.05 times applicable specifications per °F.

POWER: 9 volt battery (NEDA 1604).

BATTERY LIFE: 100 hours (typ), alkaline battery.

LOW-BATTERY INDICATOR: Display indicates "BAT" when less than 10% of life remains.

AUTOMATIC TURN-OFF: Voltmeter turns off after 10 minutes (typ.) of operation to conserve battery life. Turns off below 6.5v (typ.) battery voltage.

SIZE, WEIGHT: 6.3" X 2.7" X 1.2", 12 oz.

CONSTRUCTION: Heavy duty ABS plastic housing.

DESCRIPTION

Model 122 Voltman is a rugged and fully automatic voltage and continuity tester. It determines whether inputs are AC or DC and displays the appropriate value. When both AC and DC are present, Voltman automatically selects and displays the larger voltage. A display backlight and an audible beeper enhance Voltman's versatility in field applications.

"Phantom readings' caused by capacitance-coupled inputs are attenuated by Voltman's low input resistance. When "real" current carrying voltages are applied, Voltman automatically switches to a high input resistance mode. Voltman functions as a continuity tester when no external voltages are detected. The audible beeper emits a continuous tone when continuity is detected, and a pulsing tone when voltage is detected. The display backlight turns on when voltage is detected.

After 10 minutes of operation, Voltman turns off automatically to extend battery life. Voltman indicates a low-battery condition on its display. As the battery approaches a deep discharge condition, Voltman switches off until a new battery is installed.

UNPACKING AND INSPECTION

Each instrument is inspected both mechanically and electrically before shipment. Upon receiving your instrument, unpack all items from the shipping container and check for any obvious damage that may have occurred during transit. Report any damage to the shipping agent. Retain and use the original packing materials if reshipment is necessary.

The following items are included with every shipment.

1. Model 122 Electrical Service Voltmeter.
2. Instruction Manual.
3. 9 volt Battery (NEDA 1604).
4. Optional Accessories as requested.

BATTERY INSTALLATION

WARNING

Disconnect probes from exernal circuits and turn the instrument off before removing the bottom cover. Reinstall the cover before resuming use of the instrument.

Each instrument is supplied with a 9 volt battery. Follow these steps to install the battery.

1. Place the unit face down on a bench or other similar surface and remove the screws from the bottom cover.

2. Separate the bottom cover from the rest of the instrument by grasping the top of the case (just above the display) and carefully lifting it away from the display.

3. Remove the old battery.

4. Place the new battery in the battery compartment. Be sure to observe the polarity marked inside the case.

5. Reinstall the bottom cover before resuming use of the instrument. Be sure to reinstall the switch cover.

WARNING: These servicing instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

OPERATION

WARNING

Observe safety precautions listed in Safety Precautions section of this manual.

The automatic features of Voltman make it easy to use. Just slide the power switch to the ON position. If the BAT annunciator is displayed, the battery should be replaced. It is good safety practice to check instrument functionality before use. The section on Functionality Checks gives a suggested check procedure.

After approximately 10 minutes of operation, Voltman will turn off automatically. To turn Voltman on again, return the power switch to the OFF position, then back to the ON position.