

# M590 Explosive Safety Fire and Test Set Ruggedized and Weatherized

## Water and Dust Resistant Igniter Tester and Fire Set



## Battery Powered Failsafe Igniter Tester and Fire Set

The AMPTEC RESEARCH M590 Explosive Safety Igniter Tester and Fire Set is designed for use in harsh environments, on the go “mobile” take it anywhere *Firing/Test range* use on a variety of ordnance, such as electrical primers, EEDs and Squibs. Not only representing the latest in ultra-safe resistance testing on explosive devices (i.e. squibs, igniters, flares, detonators) the AMPTEC M590 internal packaging and impact resistant case is also constructed to a water and dust tight standard. The polypropylene case is water proof when closed (and purge valve is shut) to a depth of 3 feet. It also floats in water and *can be operated outside in direct rain, as it has silicon boot seals over all switches*. The SuperBright LEDs are 5 times brighter (25,000 lumens) than normal “high intensity” LEDs. The unit features a wide viewing angle (tilted) ergonomic display - readable in direct sunlight, *a shielded Faraday cage design for EMP, ESD protection, noise immunity, Chassis Grounding Safety and more*. The AMPTEC RESEARCH M590 Explosive Safety Igniter Tester and Fire set is designed for use in harsh environments (from +50° C down to -10° C). The heart of the unit’s failsafe resistance measurement circuitry is the field proven U.S. Department of Energy accepted AMPTEC 630ES Explosive Safety Igniter Tester.

The Multi-Channel AMPTEC M590 comes ready to use, and ready to connect (includes two blank mating connectors with short 48” hook-up lines) to your squib/primer “Measurement” and “Fire/Test” lines. *Custom length “Fire and Test set” Measurement and Test lines (i.e. 30 meters long) are also available* from AMPTEC RESEARCH. The AMPTEC M590 has a laminated Instruction/ Operation card in the units lid that makes it easy for test personnel to understand and use.

## Key Locked Main Power Switch



Remove the key, the M590 is locked in “Safe Mode” (it *cannot* be accidentally switched to Fire or Measurement “ARMED” mode). The battery powered AMPTEC M590 Fire and Test Set can also *only* have it’s Main Power Key switch enabled when the unit’s battery charger power cord is removed. *The only way to get a “Fire” state* from the unit’s 5.0 ampere supply output across the EED or “Squib under Fire” is the M590 Operator must have: *A) the battery charger power cord is removed and B) the keyswitch has the key inserted and the C) keyswitch is placed in the “Armed” position, and D) the Protective cover over the Flashing LED “Fire” button is lifted and E) then the “Fire” button is pressed*. The user also has the flexibility of selection *either* 24V - 5 amp to 20 amps short bursts or 12VDC - supply output “Fire” modes.

## Lift Safety Cover to Access Armed Flashing Daybright LED Fire Mode Switch



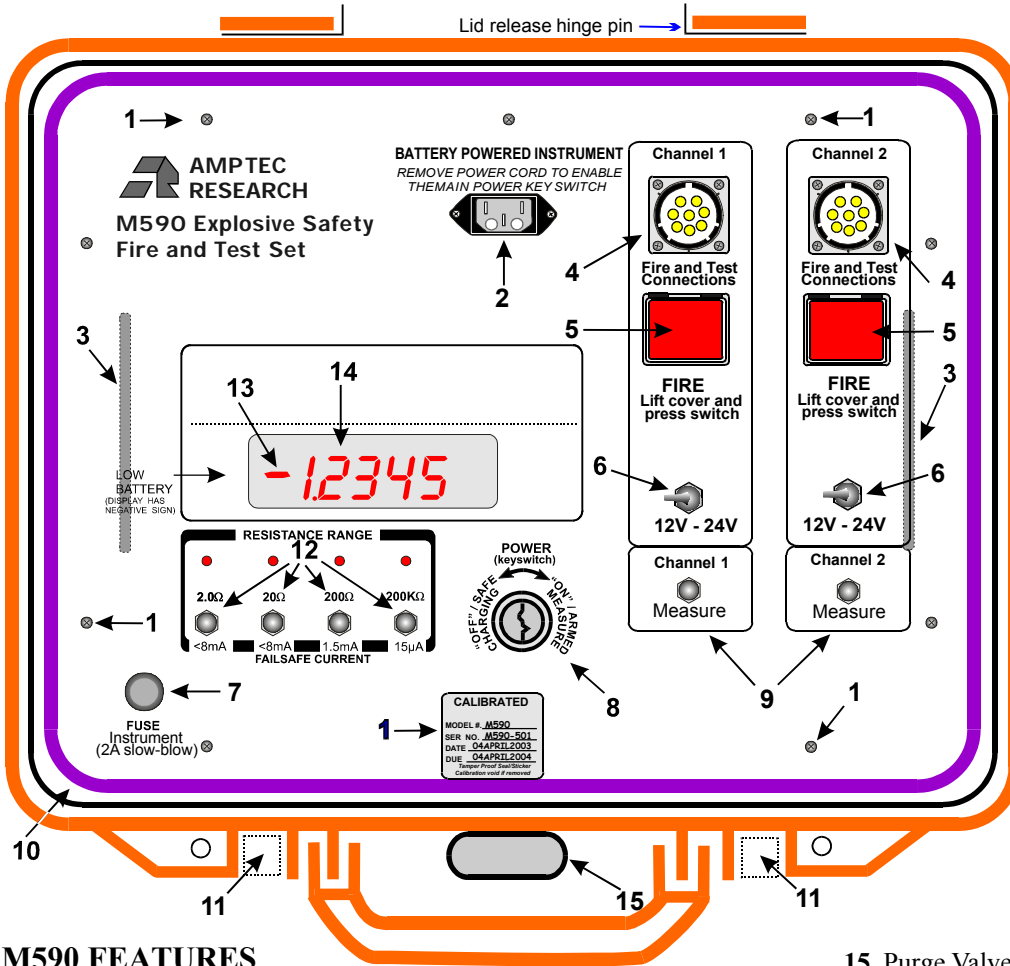
Flashing LEDs underneath the Protective Safety covers for the “FIRE” switches inform the user when the AMPTEC M590 is in “ARMED” ready to Fire mode.



*Multi-channel Measurement and “FIRE” capability (12 V or 24 VDC modes)* provides for a pre-fire squib resistance test, then allows for firing the squib and then *checking for an “open” resistance state after firing*.

*The AMPTEC M590 Test Set uses a 4 Terminal or 4 Wire Kelvin Output (2 wires output a constant DC current and 2 wires sense the voltage drop across the resistance being measured)* to insure test lead length and test lead contact resistance are *eliminated as sources of measurement error*.

# M590 Explosive Safety Fire Test Set



## M590 Versatility and Failsafe

The battery powered AMPTEC M590 includes its own internal battery charging system, both 12 V and 24 VDC Fire Modes, operator / maintenance manual and United States N.I.S.T. Traceable Calibration Certificate. The M590 has the safety integrity for the most demanding explosive safety requirements. A *shielded Faraday cage* (all to *chassis ground*) lines the entire M590 case and *all the test lead wiring* (ie Vhi, Ihi, etc) *are shielded. All shielding is connected to chassis ground to provide additional electronic noise immunity, ESD and EMP protection.* The battery operated M590 Fire and Test Set can only be operated when the battery charger power cord is removed ( 2 paddle switches detect presence of power cord plug - 2 switches in case 1 switch should ever fail) and the locking keyswitch must be in the "ON" Armed position *before* the cover protected "FIRE" switch starts blinking to indicate the M590 is armed. The safety access cover additionally prevents any accidental pressing of the *flashing Red* "ARMED" FIRE switch.

## M590 FEATURES

1. **Access Screws** Calibration/Maintenance - Sealed with a Tamper Resistant Foil Calibration Sticker
2. **AC Battery Charger Power plug** - Spring loaded Plunger rods (dual paddle switch based) detect when power cord is connected and automatically disable all operational power and enable charging circuit. *M590* will not operate or output (fire) any current until the power cord is removed.
3. **Handles** - see item #1 then lift for calibration access
4. **Polarized Notched Test & Fire Connector** - Test lead & Fire (M59 Primer ) Circuit hookup - Dustcap protected (not shown)
5. **Fire Switch** - Lift *Safety/Protective Access Cover* and press switch to activate ( *Battery Charger Power Cord must be removed & Main Power Safety Keyswitch* to be in the "ON" armed position *before* the FIRE switch will operate. (*ARMED MODE FLASHES*)
6. **Battery Powered Fire Voltage Selection Switch** - choice of 12V or 24V output modes
7. **Instrument Fuse Access** - (seal in cap of holder) .
8. **Keylocked Main Power Switch** - Locks the M590 in *Safe mode* - turns all power "OFF", disconnects all power from the measurement and Firing electronics, and places it in ready to recharge battery mode when power cord is plugged in .
9. **Measure Switch** - press either channel 1 or 2 to measure electrical resistance (using the *proven AMPTEC 630ES Explosive Safety Ohmmeter Circuitry*) of electrical primers or squibs under test.
10. **Water Resistant O-ring seal(s)** in lid & under front plate.
11. **Tight Squeeze Flip Latch Area** - waterproof seal (closed).
12. **Resistance Ranges** - 2Ω, 20Ω, 200Ω, and 200KΩ - silicone rubber boots provides water-resistance switch cover.
13. **Low Battery Level** ( Minus sign ) - recharge time
14. **Beveled Display Hood and Super Bright LED Display** readable in sunlight. *The 2 Ohm range has 100 μΩ resolution*

15. **Purge Valve** - Provides Air Pressure Equalization to open.

## SPECIFICATIONS

- Measurement Accuracy:** (180 days 25°C ± 10°C) ± 0.02% of reading ± 0.05% of range for the 2 Ohm range, ± 0.02% of rdg and ± 0.02% of rng for 20 ohm thru 200 Kohm ranges.
- Failsafe Current :** < 8 mA - 2 Ohm and 20 Ohm ranges, < 1.5 mA - for 200Ω range, <15 μA for the 200 KΩ range.
- Display:** 4½ digit (19999) SuperBright L.E.D. - 20,000 counts, Display is visible in direct sunlight.
- Terminal Configuration:** Four-wire Kelvin
- Maximum Input:** 250 VDC or peak AC without damage
- Operating Temperature Range:** 0°C to 50°C
- Measurement Power:** Rechargeable Ni-Cad batteries (5.0 Ahr) & built-in Internal Charger (115 VAC 50-60 Hz or 220VAC 50Hz)
- Firing System :** 12VDC or 24VDC@1.6Ahr (high capacity rechargeable LiMH battery packs)
- Humidity :** 5 to 95%, waterproof to 3' depth when closed
- Size:** 295mm/11.5" D x 335mm/13.5" W x 155mm/6" H
- Weight:** 22 lbs NET, 25 lbs shipping
- Drop/Impact Specification:** Designed and tested to survive a 3' fall (i.e instrument cart to floor).

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