

FS-43 Firing System



DESCRIPTION

The FS-43 EBW Firing System is designed for field firings where the actual module voltage must be monitored and instantaneous firing is required and AC power is available. The separate module allows long distance and remote firings to be performed. The system includes a Control Unit (P/N 188-7238) and a Firing Module (P/N 188-7096).

DESIGN AND SPECIFICATIONS

Input Energy

- 110 VAC standard
- 220 VAC available

Output Energy

- 4000 volt pulse with 1500 amperes peak current into low resistance load. (8.0 joules)

Circuit

- DC to DC converter with high voltage energy
- Triggered gap for instantaneous firing (less than 10 microseconds)
- Meter in Control Unit to monitor voltage
- External or manual trigger.
- Trigger monitor
- Remote arming

Control Unit Input Connection

- U.S. Type, 3-pin plug for 110 VAC

Control Unit

- Safety Interlock Connector

- Sealed Arm Switch with indicator light
- Adjustment for long control cables
- Three-pin plug for 110 VAC
- Meter to indicate module arm voltage and discharge rate
- Six-pin connector to module
- Three-pin connector for remote arm
- BNC connector for external trigger In and Out
- Short circuit protected
- External dimensions: 19" x 5" x 13"

Control Unit to Module Connection

- Requires 3-pair shielded cable
- Maximum 10,000 feet of 20 gauge wire

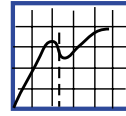
Module

- Six-pin connector for connection from Control Unit
- Safety interlock connector
- Five-way binding post output terminals

Module to Detonator Connection

- Maximum 100 feet twin lead blasting wire, P/N 167-8559 or 300 feet maximum Type 'C' coaxial cable, P/N 167-2669

Caution: While EBW and EFI Initiators are inherently less susceptible to accidental detonation during handling and set-up than devices containing primary explosives, electrical and electronic firing systems are sensitive to transient electrical energies which could cause premature triggering or firing. The blasting area must be clear of personnel and equipment before the detonator leads are connected to any RISI Firing System. Only approved RISI Firing Systems should ever be used to initiate or detonate any explosive product manufactured and authorized for sale by RISI.



FS-43 Operation Discussion

The purpose of the FS-43 Control Unit is to provide low voltage electrical energy to the Firing Module and to ensure a safe and reliable operation sequence for the firing of EBW detonators.

The output from the Control Unit to the Firing Module is 40 to 120 volts. This output occurs when the “Arm” switch is held in the “Arm” position and the shorting plug is mated into the Control Unit “Safety Interlock” connection. When the system is armed, the “Firing Volts” meter will read the high voltage from the Firing Module. The “Line Adjust” knob is then used to adjust the firing voltage to 4000 volts before firing is initiated. When the “Fire” button is pressed or an external pulse is applied to the “Accessory” connection, detonation will typically occur within 10 microseconds (10×10^{-6}). Should the operator wish to abort firing while arming is taking place, simply release the “Arm” switch.

The purpose of the FS-43 Firing Module is to provide a significant amount of flexibility to this EBW detonator firing system. Since the firing pulse to function the EBW detonator must be applied at the proper rate of rise, or frequency, the firing module must be placed relatively close to the detonator. By being able to separate the Firing Module from the control unit, the operator can perform the detonation at extended distances as required by the size and characteristics of the main explosive charge.

The input charge to the Firing Module must be between 32 and 40 volts. This low voltage input is applied to the input connector which charges a one microfarad capacitor. When this capacitor reaches 4000 volts, the Firing Module is ready to be fired. Triggering of the triggered spark gap occurs by applying a 30 volt pulse to the input connector. This discharges the one microfarad capacitor into the yellow terminals which, if properly connected, will fire the EBW detonator. Detonation will occur in less than 10 microseconds from the time that the 30 volt pulse is applied.

By mating the shorting plug to the “Discharge” connector, the energy storage capacitor is completely and immediately discharged thus precluding inadvertent arming of the firing module and detonation of the EBW detonator.

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