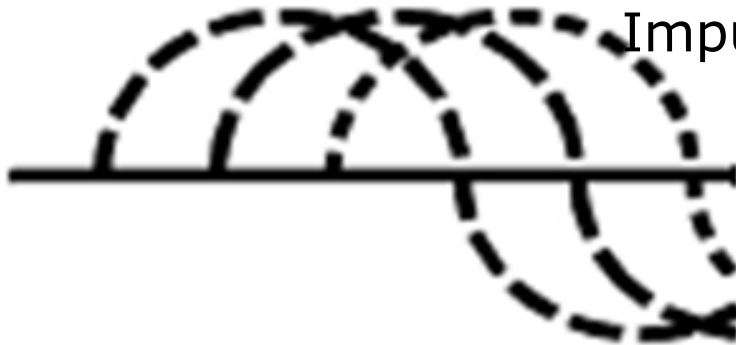


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Rejuvenation Instructions Impulse Phaser



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- Ultrinium™ sustained pressure injection method (U.S. Patent 7,615,247)
- Ultrinium™ formulation optimization injection method (U.S. Patent 7,611,748)
- Injection Adaptor (U.S. Patents 7,195,504, 7,538,274 and 7,683,260)
- Perfectium™ single visit, single switch injection (U.S. Patent 7,353,601)
- Formulation of Ultrinium™ & Perficio™ components (U.S. Patent 7,658,808, 7,700,871 and other patents pending)
- Predicting performance of Electrical Power cables (U.S. Patent 7,643,977, 7,700,871 and other patents pending)
- Formulation of Ultrinium™ & Perficio™ components (patents pending)
- N-Rex™ submarine cable injection process (U.S. Patent 7,976,747)
- N-Ter™ injection or Novinium thermally enhanced rejuvenation (patent pending)
- Reticular Flash Preventer (RFP) provides safer operation of conventional injection elbows (patent pending)

Version 20111024

Timco Instruments Impulse Phaser

WARNING - OBSERVE THE RECOMMENDED SAFE WORK PRACTICES RELATED TO THE VOLTAGE CLASS OF THE CIRCUIT WHEN USING THIS INSTRUMENT!

GENERAL: Before connecting the **IMPULSE PHASER** to **ANY** cable circuit, it is imperative that the circuit be **DE-ENERGIZED** and **GROUNDED** to insure personnel safety. The **IMPULSE PHASER** will only operate properly on grounded circuits. Use on faulted cables may cause inaccurate indications!

DESCRIPTION:

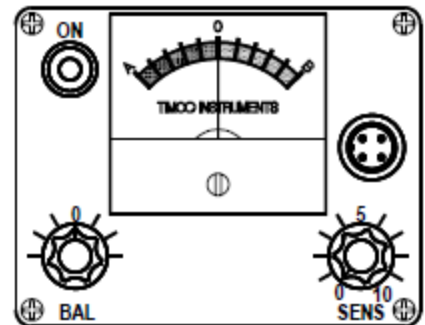
The Impulse Phaser is designed to:

1. Identify single or three conductor cables in vaults or trenches regardless of the outer covering (e.g.-extruded jacket, lead sheath, metallic shield, or conduit).
2. Establish or identify phases within a three phase circuit.

The transmitter is powered by either a 120V AC source or an internal battery. The circuit automatically switches to its battery if the AC source is disconnected during operation. The battery supplies several hours of constant operation and will re-charge in approximately 1 hour. Plug in the transmitter and the battery charges automatically. The detector system consists of a signal processor and a clamp-on device. The signal processor is powered by a 9V alkaline battery. The momentary push-button "ON" switch extends the battery life. The "BAL" control is used to center the indicating needle of the meter. The "SENS" control is used to regulate the signal strength of the processor.

The transmitter controls consist of:

- On-Off toggle switch
- Red AC indicator lamp and 1/2A fuse holder
- Amber indicator lamp - when flashing indicates the transmitter is functioning properly.
- Red indicator lamp - lights when high loop resistance or ungrounded.



Caution: Working around energized high-voltage systems may cause serious injury or death. The procedures in these instructions should be performed by personnel familiar with good safety practice in handling high-voltage electrical equipment. De-energize, test and ground all electrical systems before proceeding.

1. **URD Cable Identification.** There are occasions where a trench or pit is dug exposing a group of URD cables where one of the cables is de-energized and must be identified. To identify the de-energized cable:
 - a. Make sure the batteries are sufficiently charged.
 - b. Remove the cable from the equipment on both sides of the area where the cable is to be identified. Ground both ends of the cable to insure that the cable is in fact de-energized.
 - c. On one end, be sure that the cable conductor is grounded to all of the commonly connected neutrals.
 - d. On the opposite end, connect the red lead of the IMPULSE PHASER to the cable conductor. Attach the YELLOW lead to the commonly connected neutral. Remove the cable conductor ground and turn the IMPULSE PHASER transmitter "ON".
Make sure these connections are superb!
 - e. At the exposed cables, explore all of the cable in the trench by clamping the pick-up coil over each cable. One cable will have a unique signal. If the pick-up coil is attached to the cable with the labeled side toward the transmitter, the cable connected to the RED lead will give an "A" deflection of the meter needle. All other cables will give a "B" deflection. If the deflections are not in the direction expected the cable path may include an unanticipated jog. The cable path should be verified with a RF transmitter and receiver.
 - f. After the IMPULSE PHASER is removed and the cable conductor is grounded, the cable **must** be spiked to insure personnel safety.

