Western Instruments

Established 1965

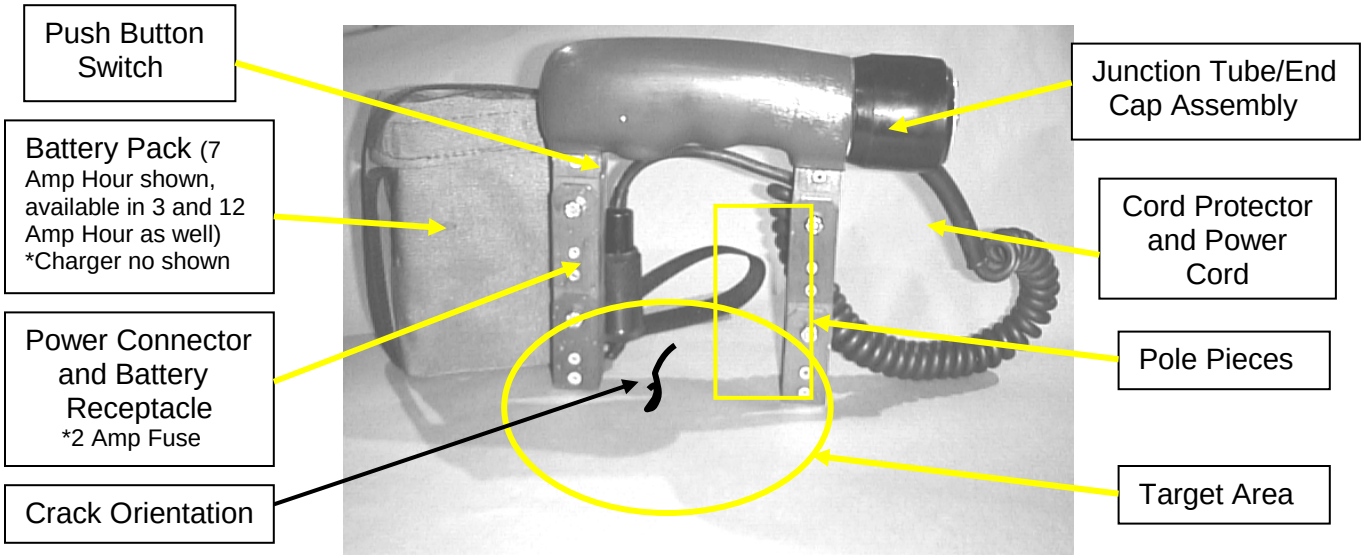
April, 2010

Operating Instructions

WC-8

Compact 12 Volt Yoke

The WC-8 allows the Operator to induce a Pulsing DC inspection field (125Hz) into the ferrous material being tested. The device should be utilized within the parameters set by the operational specifications within this guide.

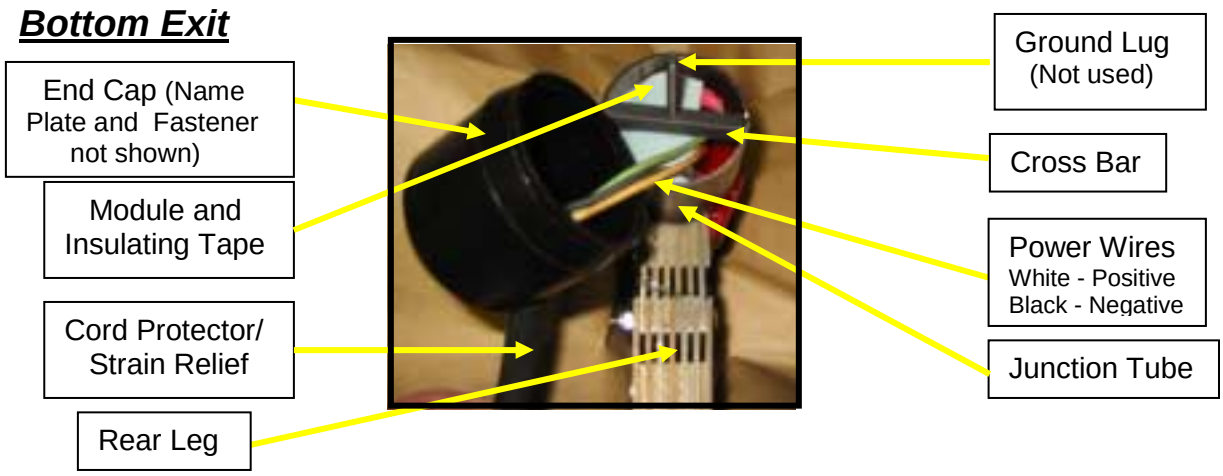


1. **Solid State Push Button Switch –** The Switch was designed for comfort and safety. While depressed, the switch delivers a ½ Watt control signal to the electronic controls (semiconductors) sealed in the Output Module. The Module is housed in the Junction Tube of the Yoke, and supplies the necessary power (AC) to the coil encapsulated in the Yoke housing.

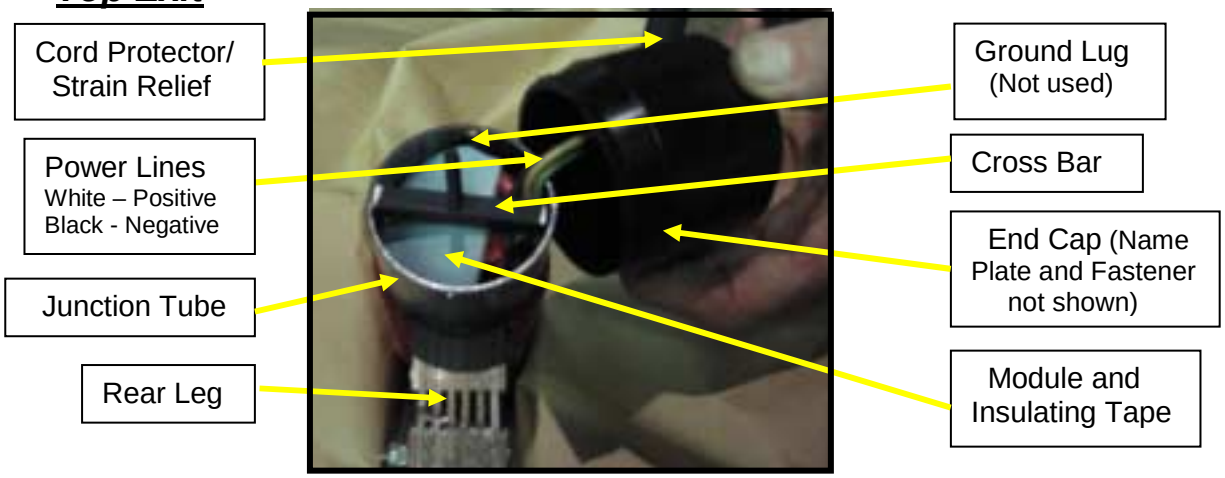
   If the Yoke fails to turn on when the switch is depressed, check the following items in this order; AC Power, Power Plug, Power Cord, Output Module, and lastly the switch via the internal connector. Removing the rubber switch cover voids the 2 year warranty on this item.

2. **End Cap Rotation –** The End Cap may be rotated to reposition the Cord Protector (Strain Relief), for operator convenience, within the Bottom 120º or Top 120º of the Junction tube. Carefully remove the End Cap, followed by the internal Cross Bar, and reposition the power wires. Replace the cross bar, ensuring the insulation disk (or tape) is in place and carefully reinstall the End Cap. Care must be taken not to twist or 'pinch' wires, on either the mounting bar or End Cap.

Bottom Exit



Top Exit



3. Operational Parameters - The Operational Parameters or Duty Cycle for the operation is set to avoid damage to the internal coil or the Output Module, and must be observed.

12 Volt Operation: It is recommended that the operator does not keep the Yoke on for more than 5 minutes at a time, as the Yoke housing may get to warm to hold over about an hour. However, the basic design of any DC Yoke inherently produces heat. Typical operation is 15 - 30 seconds on, while applying inspection media and inspection, followed by 5 - 15 seconds off to repositioning the Yoke to the target area.

If the Yoke is used for prolonged periods of time such as 2 to 3 hours of continuous cycling, as outline above, the Yoke will get warm. If the WC-8 is used in this manner the operator must provide time for a sufficient cooling period, or components in the Electronic Control Module may fail. A 75% Duty Cycle is a reasonable guideline.

The WC-8 can be used with one of Western Instruments 3 Battery Packs (3, 7, or 12 Amp Hour Capacity) or from a Automotive Battery/Accessories Outlet. The 12 Volt Connector, on the end of the 'Coiled Cord' , has an internal fuse rated at 2 Amps. 12 Volts off an Automotive Supply, taken after the battery, will not charge one of Western's Battery Packs. Western Instruments' Battery Chargers, operating from an AC Power Source (115 or 230 Volts) with a DC Charging voltage of over 14 Volts similar to an Automotive Alternator.

4. Field Characteristics

Pulsing DC Field – The Pulsed DC (125 Hz) Magnetic Field is stronger than an AC Field and tends to penetrate the work piece more deeply, however DC is still sensitive to surface defects. Inspection media tends to adhere to the entire target area of the work piece, due to the reduced particle mobility, and may need to be 'blown off' to fully reveal an indication. The intensity of a DC Field, by it's nature, is fixed but the Yoke does Pulse the field providing some stimulus for the particles to migrate to defects.

It must be noted that there is no demagnetization provision on the WC-8, so parts will have some residual field in them after inspection. The work piece can be tested with

a Magnetic Field Indicator, such as the W-Series W-FI®, to measure the residual magnetic field.

5. Operation

Position the Pole Pieces (Feet) on the work piece. The area between the pole pieces is your target area, which also extends laterally out, approximately 1.5" (38mm), from either edge of the pole pieces. The Field will expose defects that are transverse to the centerline between the Pole Pieces. The Pole Pieces should be positioned so that as much of their contact surfaces as possible, are on the work piece. The Yoke is then energized, by pressing Push Button Switch, and Magnetic particles are applied. Dry Method Particles are dusted between the Pole Pieces and over the target area, while Wet Method Particles are sprayed in a similar manner.

The Target Area is then inspected visually for a collection of Particles around defects. A Black Light is used to aid visual inspection when Fluorescent Particles are used. Indications found with Dry Powder will tend to form immediately, and will take slightly longer with Wet Method Particles. If the typical direction of defects is not known, rotate the Yoke through 90º and repeat the inspection of the target area.

As the WC-8 produces a standard amount of Field Blow as other DC Yokes. Field Blow is a collection of Inspection Media between the Pole Pieces, transverse to the centerline between the Pole Pieces, and may case a masking of indications. Field Blow can be minimized by extending the Pole Pieces farther apart, If work piece configuration does not permit extending Pole Pieces, reduce the contact area of the Pole Pieces on the work piece. Follow the Operational Parameters outlined in these instructions

6. Maintenance.

After extended use the Yoke should be cleaned with a mild soap solution. The unit should be visually inspected for any damage that could cause harm to the operator, or the material being inspected. Special attention should be paid to the Push Button Switch Cover, to ensure it is fully adhered to the body of the Yoke. Furthermore, the Power Plug, Power Cord, and the End Cap/Cord Protector should be in a good state of repair. While performing maintenance, cleaning, or repositioning the End Cap the Yoke should be disconnected from any power source, with safe industrial practices employed. Any potential problems to these assemblies must be reported to the Distributor or Western Instruments for instructions on corrective action.

Whether industrial specifications are being observed or not, the Yoke should be tested periodically, using certified Pull Test Bar(s) such as the W-Series W-PT®, to ensure it continues to lift the specified amount of weight. If the unit fails such a test, first inspect the Pole Pieces to ensure they fully contact the test weight. If the unit continues to fail, contact the Distributor or Western Instruments for instructions on corrective action.

The Output Module (located inside the Junction Tube) is clearly identified with Positive (+) and Negative (-) terminal receptacles. The White wire on the Power Cord is connected to the Positive (+) terminal and the Black wire is connected to the Negative (-) terminal. Conversely, on the Cigarette Lighter Plug for the Power Cord, has the White Positive (+) wire connected to the Central Contact, and the Black Negative (-)

wire connected to the outer or shell contact. Reversal of these wires, and the resulting polarity, will cause the Output Module to fail.

7. Battery Charging

Western Instruments offers batteries with a Nominal Capacity of 3, 7, or 12 Amp Hours, and as of April 15, 2012 we have introduced our new Model RS5022 Smart Charger. The RS5022 has an input voltage of 100 to 240 VAC at 50 to 60 Hz, and is rated at 2 Amps continuous output Following the universal rule of thumb for battery charging; divide the battery capacity (Amperes) by the charger output (2 Amps), and the result will be the number of hours it takes to charge a fully discharged battery.

The RS50212 is processor based, so it must be disconnected from mains power when not in use. To charge the battery, plug the charger's output connector into the battery receptacle before plugging the charger into Mains (AC) Power. The RS5022 will sense the condition of the battery, and will set itself for an optimum charging cycle.

Batteries should not be left on charge indefinitely, however, Western Instruments' Model RS5022*Smart Charger* will not typically damage a battery if it left charging for more than the specified times. The Wiring Color Code on the Battery and Charger is as follows; Red – Positive (+); Black – Negative(-).

Battery Charging and Yoke Operation Chart:

Battery Type	3 Amp Hour	7 Amp Hour	12 Amp Hour
Charging Time	1.5 hours	4 hours	6 hours
Yoke Operation Time	6 Hours	14 hours	24 hours

Note: Charging Times will vary, depending on the residual charge in the battery.
Operating Times will very, depending on the overall condition (age) of the battery.

Battery Duration Tests are routinely performed to test Product Performance, however are far more demanding than typical field inspections, as units are typically not activated on a continuous basis (see *Operation Chart*). The WC-8 will lift 50 Pounds with as little as 8 Volts of power left in the battery. The WC-8 can be easily tested with 5 Pull Test Bars, such as Western Instruments W-PT®, fastened together.

If a Battery Pack is supplied with 2 Cigarette Lighter Outputs, it is **not** acceptable to have the *Smart Charger* connected while operating the Yoke. The second Output is installed for a 12V UV Lamp or similar accessory. Operating such an accessory, from the Battery Pack, will affect how long a charge will last.

8. Pull Test / Calibration

When performing a 40 Pound (18kg) or 50 Pound (23kg) Pull Test, ensure the contact feet are flat as possible on the Pull Test Bar (W-PT®), which Ensures as much magnetic attraction as possible. Reference Specifications also specify the distance between the poles should never exceed 6" (150mm), because the field no longer flows from one pole (+) to the other (-). If a Yoke fails a pull test, it should be sent to a qualified facility for Contact Foot Dressing.

9. Warranty

Western Instruments warrants its products, against defects in materials and workmanship for a period of 1 year from receipt by the end user. If Western

Instruments receives notice of such defects during the warranty period, Western Instruments will either, at it's option, repair, replace, or condemn products that prove to be defective. Consumable items, such as Batteries are warranted for 30 days, from receipt by the end user.

Any warranty is void if the unit has been modified in any way, or if it has been repaired by an unauthorized agency. The end user agrees that any equipment's disposition, when returned for warranty work, is at the full discretion of Western Instruments as to whether a claim is under warranty or due to misuse. Western Instruments warranty shall overlook normal wear, however does not include operation outside the environmental specification of the product. All warranty work is FOB Western Instruments, and any returned units shall include a written description, by the end user, of the fault.

Western Instruments makes no other warranty, either expressed or implied, with respect to this product. Western Instruments specifically disclaims any liability arising form the use of this equipment. For the correct use of the product, refer to the Operating Instructions, furthermore we recommend instructional training to CGSB, ASNT, or other regulatory authority qualifications. Western Instruments highly recommends the end user exercise all possible safety precautions, including use of protective equipment, while operating this or other industrial equipment.

Specifications:

Model: WC-8 or WC-8K
Voltage: 12VDC
Current: 0.5 Amps @ 12 Volts DC
Controls: Solid State (Mosfet)
Charger Voltage: 115VAC or 230VAC (K)
Charger Current: 3 Amps
Capacity: 50 Pounds (23 Kg)
Pole Spacing: 0 – 11" (0 – 280mm)
Pole Cross Section: 1" (25mm)
Weight: 6.5 Pounds (3 Kg)
Cord: 1' Coil, extends to 6' (1.8m)

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