

**DRPI Detector/Encoder Card Tester
Model RC200
Specifications**

Introduction

The RC200 Card Tester is designed for troubleshooting and testing of Westinghouse Digital Rod Position System (DRPI) 1047F28G01, or equivalent, Detector/Encoder (D/E) cards. Useful for bench or field testing, the tester can exercise the entire DRPI system by simulating rod movements. A modular design is used to reduce the amount of equipment that is taken into containment and to facilitate test setup.

Components

The three major components are:

- Power Supply
- Coil Stack Simulator (two supplied)
- Control Unit

Power Supply

The Power Supply assembly is used for bench testing of D/E cards. The supply provides +15 VDC and -15 VDC logic voltages for the card and 6 VAC for the coils. A variable transformer is used to provide continuous adjustment of the 6 VAC supply over a range of up to 8 volts.

A card edge connector mates with the D/E card rear connector.

Logic gates are provided for card addressing and data readout. Provisions are made for testing the integrity of diodes in the address and data lines on the card. As the Coil Stack Simulator varies the rod position, gray code data is sent to the Control Unit.

An 8 character LED display provides selectable readout of AC voltage, steps, gray code, errors, and D/E card feedback voltage.

Operation of the power supply is controlled by the Control Unit, described below.

An RS232 connection is provided for computer data logging.

Test points allow connection of an oscilloscope or other test equipment to D/E card pin 13 feedback voltage for troubleshooting.

Coil Stack Simulator

Two card stack simulators are provided, one configured for Group A coils and another for Group B coils.

The Coil Stack Simulator contains an array of power resistors and solid state relays. 6 VAC is dropped across the resistor array and the 5 ohm terminating resistors on the D/E card. Resistor values are selected so that the voltage seen across the termination resistors is approximately 1.15 VAC for a simulated penetrated coil and 1.6 VAC for a non-penetrated coil.

The simulator mates directly to the D/E card front connector.

Operation of the simulator is controlled by the Control Unit, described below.

6 VAC is supplied to the simulator from the Power Supply (bench testing) or from the DRPI 6 VAC bus (field testing).

Control Unit

A handheld Control Unit is used to sequence the Coil Stack Simulator and to address and read data from the Power Supply.

A 4 line x 20 character backlit LCD display is used for readout.

The Control Unit contains no batteries. It obtains power from the 6 VAC supplied to the Coil Stack Simulator , from the Power Supply, or from an external power adapter.

Two RJ12 connectors are used. For bench testing, one is connected to the Power Supply and the other to the Coil Stack Simulator. For field testing, one or both are connected to Coil Stack Simulators to allow simulation of Group A and/or B coils.

Software

Software is provided to allow test results to be downloaded to a computer for documentation.

Tests

Bench tests that may be performed on a detector/encoder card include:

- Verify gray code data at each step position
- Dynamically record gray code data during a simulated rod drop
- Observe card feedback voltage during a rod drop (requires separate oscilloscope)
- Verify card addressing
- Verify failure condition detection, including open coil, shorted coil, and loss of 6 VAC
- Energize card to facilitate component level troubleshooting

Field tests that may be performed on a detector/encoder card installed in the data cabinet include:

- Simulate rod position to Group A and Group B D/E cards.
- Simulate rod drop for one rod, Group A and Group B D/E cards.
- Simulate open coil, shorted coil, and loss of 6VAC failure conditions.

Automatic rod sequences include linear drop, linear withdrawal, withdraw then drop, and a programmed drop which mimics acceleration and dashpot deceleration. Rates are adjustable over a wide range.

Standard Equipment

The Detector/Encoder Card Tester is supplied as a kit containing the following items:

- 1 EA Control Unit
- 2 EA Coil Stack Simulator
- 1 EA Power Supply
- 2 EA Cable, Power, 6 Ft, 6 VAC, data cabinet bus to Simulator
- 1 EA Cable, Power, 2 Ft, 6 VAC, Power Supply to Simulator
- 2 EA Cable, Data, 25 Ft, Control Unit to Simulator
- 1 EA Cable, Data, 6 Ft, Control Unit to Power Supply
- 1 EA Cord, 120VAC Power
- 1 EA Power Adapter for Control Unit
- 1 EA Software
- 1 EA User's Manual
- 1 EA Carrying Case