



Order Number

Serial Number

Number in Batch

PRODUCT TEST MANUAL

2HSA521K6

**125V DC TIME DELAY RESET MULTI-TRIP RELAY
0M+20B**

Issue Level	Date	Summary of changes
A	16/08/2006	Initial issue.
B	25/08/2006	Further detail.
C	17/02/2009	Update to include dropout test
D	17/08/2010	Update to include operate current test
E	17/06/2011	Update to 10ms operate time

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1. ASSOCIATED DRAWINGS

Reyrolle Drawing 2112W50206 (ISS.A)
PCI 145 ALPHA Reference Build specification
PL201 Sample Inspection Plan

2. HIGH VOLTAGE TESTING

Using the standard Matrix High Voltage test fixture apply 2KV RMS 50Hz between terminals as in 2.a), 2.b) below.
Repeat the test using three 5KV 1/50us pulses of each polarity between terminals as in 2.a), 2.b) below.

- a) All terminals together to frame
- b) Coil to all contacts plus frame

3. TEST PROCEDURE

- a) Determine the sample size for the batch by referring to the Sample Plan on PL 201
- b) Select the samples at random from the batch and check that the minimum and maximum contact gap meets the requirements of PCI 145, using feeler gauges measure the contact gap on all contacts on all contact stacks measure the contact pressures on blades that are accessible. Screw the contact make gauge into the armature and ensure that all contacts make and break when the contact make gauge is pressed on to the core pole face.

Check
- c) Manually operate the relay by pushing the armature towards the pole face of the relay. Ensure that the contacts have sufficient over travel by ensuring that all of the contacts have made before the armature is fully home.

Check
- d) Connect Aux supply to Terminal 25 to provide a permanent supply to the relay, independent of the Aux supply to activate the relay. Note that this supply must be the same voltage as the Aux voltage applied for the various tests required in this procedure.

Check
- e) Plug the relay into the Matrix Test panel.
- f) Adjust the auxiliary supply to 120% of nominal (150VDC)
- g) Operate the "CRO & Cap Discharge" switch to on, push "High Speed Relay" button. Ensure that the relay does not operate or the contacts make, a slight flicker is acceptable.

Check
- h) Connect the coaxial lead from "CH2 Trigger" on the test jig to the external trigger input on the Oscilloscope; connect the "CH1" lead on the test jig to channel 1 input on the oscilloscope. Set the time base to 2ms. Press the "Start" button and note the waveform on the oscilloscope. For positions 1-20 the time from the trigger point to the falling edge (N/C contacts) of the waveform is less than 10ms.

Check
- i) Make sure that the contact wiring of the relay corresponds to the connection diagram on the side of the relay.

Check



- j) Check that the relay operates satisfactorily at 120% (150V) and 48% (60V DC) and that **the armature is fully home.** Check
- k) Using an ammeter monitor the operate current at 62.5 and 125V. The current at 62.5 should be approximately 66-73mA. The current at 125 volts should be 130-140 mA. Check
- l) Reduce the auxiliary voltage input to 6.5% of nominal applied voltage (8.12V). All relay contacts should be dropped out AND the delay element is to be dropped out. If this is not the case, the delay element residual screw should be adjusted inwards to make sure the delay element is in the unpowered state. Check
- m) Reduce the auxiliary input voltage to zero then bring the voltage slowly back to nominal, watch the current reading on the power supply meter. Note the current at which the relay operates, this must be greater than 100mA. Check
- n) Ensure that the operate burden is reduced by the economising element after the relay has operated. Check

4. TIME DELAY

- a) Connect the relay so as the dropout time can be measured.
 b) Energise the relay and measure the time between the removal of the coil supply and the dropout time of the delay relay.
 c) The time ranges are:-

Voltage	Time Seconds
150	2.6
125	2.0
62	1.8

- d) If the time is greater than shown, adjust the residual screw on the slugged relay to reduce the time (while still maintaining the dropout voltage as per (l)).

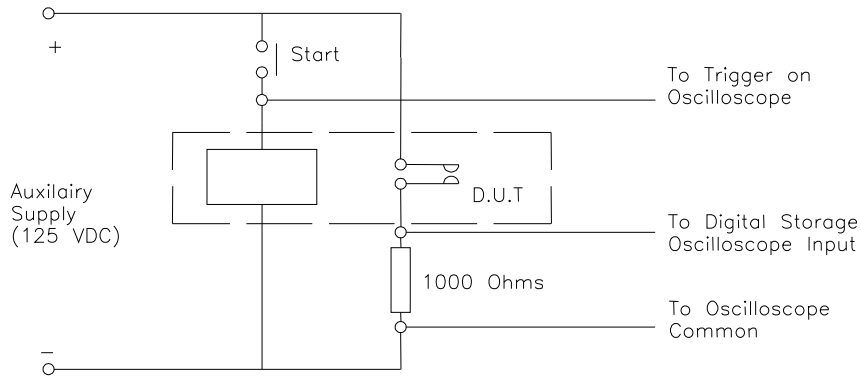
5. GENERAL & FUNCTIONAL

- a) Plug the "Alpha 20 contact" test jig into the test rack and plug in the test relay, insert the .030" gauge and slowly operate the armature by hand and note when each of the front panel LED's illuminate, all LED's should be on by the time the armature is against the gauge.
 b) Fit elastic band on the flag to prevent damage to the flag mechanism during transport.
 c) Check that the relay is electrically sound and mechanically robust as per Standard Inspection & Test Schedule 903-000-026.

PASS

6. TEST SETUP & WAVEFORMS

CONTACT TEST SETUP



Contact Test Setup. Pictorial representation shown actual schematic contains switches and various components.

CONTACT OPERATE WAVEFORMS

Below are the "Ideal" waveforms to indicate the difference between the N/O & N/C contacts

