

CALIBRATION PROCEDURE

2T104

DIGITAL SETTING TIME DELAY RELAY



Issue	Date	Summary of changes
A	6/05/2004	Initial issue.
B	10/10/2005	High Voltage test modified
C	13/06/2006	Timing accuracy specification reviewed
D	19/06/2006	Drop out time test procedure reviewed
E	10/10/2007	Quiescent current drain & opto voltage options added
F	078/03/2012	Update to Switchmode Power Supply section

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1.0 SPECIFICATIONS

Refer to the Technical Bulletin for general specifications.
Refer to each Product Test Manual for individual options or non-standard specifications.

2.0 TEST EQUIPMENT REQUIRED

DC Auxiliary Supply
Frequency Counter
Digital Voltmeter
Oscilloscope
Electronic Counter (for measuring operate times)
High Voltage Test Equipment

3.0 ASSOCIATED DRAWINGS

164-104-1xx Wiring Diagram
660-336-201 Circuit Diagram
660-336-301 Loading Diagram

4.0 SWITCHMODE POWER SUPPLY

Ensure that the power supply has been tested to PCI 162.

5.0 TIMING FUNCTION VERIFICATION PROCEDURE

Check the Job card to determine the voltage requirement for the opto inputs, if these are non standard then the minimum voltage to operate the status inputs are to be applied. Start with an input voltage below the minimum required operate voltage and slowly increase the input voltage until the relay initialises, this must be over the minimum voltage requirement. The relay must not initialise below this voltage.

The Zener diode is loaded on the PCB.

The voltage ranges are;

48 Volt Nominal

Must not pickup below 30 V

Must pickup above 37 V

110 Volt Nominal

Must not pickup below 70 V

Must pickup above 87 V

250 Volt Nominal

Must not pickup below 130 V

Must pickup above 175 V

Refer to the TC print document and ascertain the correct software to load for the job.
Program the relays to 'PC147 - Programming AVR Devices. PDF'. After programming, check the fuse code and the signature with the information on the TC print document.

Connect the timing apparatus and power supplies as per Figure 1 to measure the interval between energisation of the initiate input and output relay contact closure.

Maximum timing error

Relay Status input: 11.25ms +0.2% of time delay setting

Opto-Isolator Status input: 7.25ms +0.2% of time delay setting

- 5.1 Set the range switch to range 0.99 and time to 00.
 5.2 Check the output contact pick-up time for an auxiliary voltage of 20V (Low voltage [A]) or 40V (High voltage [B]).

Maximum	Measured
25ms	

- 5.3 Check the output contact dropout time for an auxiliary voltage of 20V (Low voltage [A]) or 40V (High voltage [B]).

With the 2T104 timed out and the timing initiate voltage applied, remove the status input signal and measure the time for the output contact to drop out.

Maximum	Measured
25ms*	

Note: * The stated maximum drop out time using this test method allows an additional 5ms for the output relay drop out time. Reset of the timer will actually occur within 20ms of the pre-set time delay. After time out, with the output contact picked up, the reset time increases to <25ms.

- 5.4 Check the quiescent current drawn from the power supply @ 110 volts input, it must be as per the table below. If not determine the cause.

Minimum	Typical	Maximum
11 mA	11.5 mA	12 mA

- 5.5 Check times for the following settings (Range 0.99ms)

Setting		Relay Status Input		Opto Status Input		Measured
		Minimum	Maximum	Minimum	Maximum	
11	110ms	99ms	121ms	103ms	117ms	
22	220ms	208ms	232ms	212ms	228ms	
44	440ms	428ms	452ms	432ms	448ms	
88	880ms	867ms	893ms	871ms	889ms	

- 5.6 Set the auxiliary voltage to 70V (Low voltage range version [A]) or 300 V (High voltage range version [B]).

- 5.7 Set the time to 10 and set range to (Range 9.9s).

Setting		Relay Status Input		Opto Status Input		Measured
		Minimum	Maximum	Minimum	Maximum	
10	1 Sec	0.987ms	1.013S	0.991ms	1.009S	

- 5.8 Set the range switch to (Range 99) and check the pick-up time.

Setting		Relay Status Input		Opto Status Input		Measured
		Minimum	Maximum	Minimum	Maximum	
99	10 Sec	9.969S	10.031S	9.973S	10.027S	

- 5.9 Set the range switch back to 9.9 and Select Delay Release.

Setting		Relay Status Input		Opto Status Input		Measured
		Minimum	Maximum	Minimum	Maximum	
10	1 Sec	0.987ms	1.013S	0.991ms	1.009S	

5.10 Select Delay Operate (Default factory timing function setting)

6.0 GENERAL & FUNCTIONAL

- 6.1 Check for correct operation of magnetic disc flag.
- 6.2 Check that the magnetic flag can be remotely reset.
- 6.3 Check the operation of the relay fail alarm.
- 6.4 Check initiate LED flashes during timing.
- 6.5 Check **RESET FUNCTION** operates as per type card & job card.
- 6.6 Check that the relay is electrically sound and mechanically robust as per Standard Inspection & Test Schedule 903-000-026.

7.0 EQUIPMENT SETUP

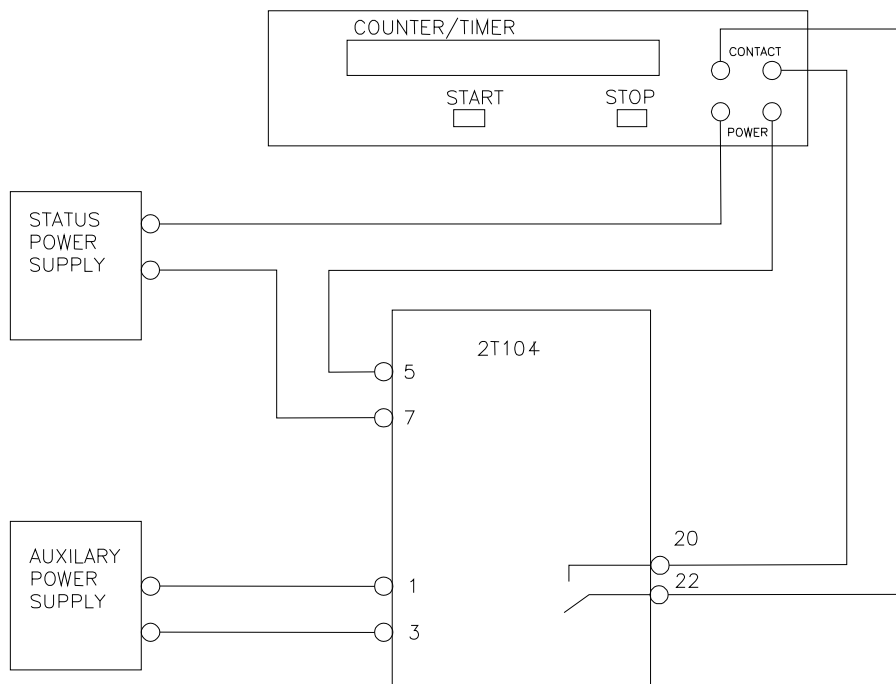


Figure 1