



159-058-907  
Sheet 1 of 8

Order Number

Serial Number

## PRODUCT/TEST MANUAL

**2C58K7**

**INSTANTANEOUS OVERCURRENT RELAY**

<b>Issue Level</b>	<b>Date</b>	<b>Summary of changes</b>
B	19/03/1997	Initial issue.

Due to RMS continuous product improvement policy this information is subject to change without notice.

<b>Document updated</b>	<b>Checked</b>	<b>Registered</b>	<b>.pdf file created</b>	<b>.pdf uploaded to web site</b>

## 1. BROAD DESCRIPTION

The 2C58K7 is a triple-pole single output instantaneous overcurrent relay having less than 20ms operate and 15ms release times at 20X setting current. Heavy duty output contacts capable of breaking 0.5A at 110VDC resistive are provided. Air-cored current transformers are used to enable fast operate times to be maintained regardless of previous current offsets which may have occurred.

## 2. SPECIFICATIONS

Auxiliary Supply Voltage	110V DC +20% -30%
Auxiliary Supply Burden (at 125V)	3W output relay dropped out 11W output relay picked up
Nominal Input Current	1A
Sensing Supply Burden (at 1A)	0.5VA
Nominal Setting Range	10% - 40% continuously variable
Number of Poles	3 (with common output)
Frequency Tolerance	-6% to +2% of 50Hz
Ambient Temperature Range	-5°C to 55°C
Accuracy	±5% of maximum setting
Dropout/Pickup Ratio	85% Nominal
Withstand Current (independent of setting)	2.5a continuous 10A for 3 seconds
Operate Time	<20ms Symmetrical or fully offset
Release Time	<15ms Symmetrical or fully offset with current interruption at a zero current crossing.

### Output Relay Contact Ratings

#### **Make and Carry Continuously**

2200 VA AC resistive with maximums of 440 Volt and 10 Amp  
2200 VA DC resistive with maximums of 440 Volt and 10 Amp

#### **Make and Carry of 0.5 Second**

7500 VA AC resistive with maximums of 440 Volt and 30 Amp  
7500 VA DC resistive with maximums of 440 Volt and 30 amp

## 2. SPECIFICATIONS (Cont)

### AC Break Capacity

2200 VA AC resistive with maximums of 440 Volt and 10 Amp

### DC Break Capacity (Amps)

Voltage			24V	48V	125V	250V
Resistive rating		a	12	1.5	0.5	0.25
		b	12	12	10	5
L/R=40mS	Maximum break	a	12	1	0.4	0.2
		b	30	15	5.5	3.5
	1K operations (N3 Rating)	b	12	12	5	2.5

a = Without magnetic blowouts    b = With magnetic blowouts

\* As tested by Powernet Yarraville laboratories in Victoria.

## 3. TEST EQUIPMENT REQUIRED

DC Supply  
AC Current Supply  
AC Ammeter  
Electronic timer  
Decade box  
Oscilloscope  
High Voltage Test Equipment

## 4. ASSOCIATED DRAWINGS

159-058-107      Wiring Diagram  
660-093-201      PCB circuit diagram  
660-093-301      PCB Loading

## 5. HIGH VOLTAGE TESTING

- a) Apply 2KV RMS between the terminal groups as listed in A & B below for 1 minute.

159-058-907

Sheet 4 of 8

## 5. HIGH VOLTAGE TESTING (Cont)

- b) Apply three 5KV 1/50usec pulses of each polarity as listed in A & B below.

### GROUP A

7,8,10,11,18,22

10,11,25,26,43,44

7,8,25,26,40,41

### GROUP B

25,26,40,41,43,44,E

7,8,18,22,40,41,E

18,22,43,44,E

## 6. CALIBRATION PROCEDURE

### 6.1 Current Sensing

#### **\*Note.**

The calibration of only one phase of the circuit will be described (input no. A). Component reference numbers refer to 660.093.201.

- a) Adjust pot knob for equal overtravel at scale ends if necessary.
- b) Apply scale minimum current through input A (terminals 25 & 26).
- c) Connect a decade box across R1 (159-058-107 reference) avlugs located on motherboard 660/94-2. The value of R1 determines the value of pickup current at a particular dial setting.
- d) Apply auxiliary supply voltage of 125 V DC.
- e) Check that TP"E" waveform is clean, and varies by a factor of four to one in amplitude as the dial pot is moved from min to max setting. R3 may be decreased if the scale span is too small or increased if the scale span is too large.
- f) Check that TP"F" waveform is as smooth as possible (ie symmetrical 3 phase ripple). If percentage ripple is too great, C5 may be altered to achieve best symmetry.

### 6.1 Current Sensing (Cont)

- g) Adjust decade box so that relay just picks up at 0.4A for dial setting of 0.4A.
- h) Check that at the 0.1A dial setting, pickup occurs at this value.
- i) Replace decade box with nearest preference value of fixed resistor, and check the following scale calibration points.

MINIMUM	MAXIMUM	NOMINAL	ACTUAL
84	116	100	mA
184	216	200	mA
284	316	300	mA
384	416	400	mA

- j) Check that hysteresis is between 80% and 87%. Repeat (f) if not.

**Actual**  %

- k) Repeat steps (a)-(i) for input B :  
 Ref (b) Terminals 43 & 44                      (c) R2  
 (e) TP'C' R21                                      (f) TP'D' C15

MINIMUM	MAXIMUM	NOMINAL	ACTUAL
84	116	100	mA
184	216	200	mA
284	316	300	mA
384	416	400	mA

- l) Check that hysteresis is between 80% and 87%. Repeat (f) if not.

**Actual**  %

159-058-907  
Sheet 6 of 8

- m) Repeat steps (a)-(i) for input C :  
 Ref (b) Terminals 40 & 41 (c) R3  
 (e) TP'A' R39 (f) TP'B', C25

MINIMUM	MAXIMUM	NOMINAL	ACTUAL
84	116	100	<input type="text"/> mA
184	216	200	<input type="text"/> mA
284	316	300	<input type="text"/> mA
384	416	400	<input type="text"/> mA

- n) Check that hysteresis is between 80% and 87%. Repeat (f) if not.

**Actual**  %

## 6.2 Operate Time Check

- a) Set input A dial to 0.1A and input A current to 2A.

PU time <19ms @ aux supply 80V  ms  
 DO time <14ms @ aux supply 150V  ms

- b) Set input B dial to 0.1A and input A current to 2A.

PU time <19ms @ aux supply 80V  ms  
 DO time <14ms @ aux supply 150V  ms

- c) Set input C dial to 0.1A and input A current to 2A.

PU time <19ms @ aux supply 80V  ms  
 DO time <14ms @ aux supply 150V  ms

## 7. GENERAL & FUNCTIONAL

159-058-907  
Sheet 7 of 8

- a) Check that unit operates satisfactorily over the range of 87.5% to 137.5% auxiliary supply.
- b) Check that R7 and R8 have been correctly loaded on motherboard.
- c) Check that quiescent current at 110 V is 26mA +10% with output relay dropped out and 100mA with output relay picked up.
- d) Check that the relay is electrically sound and mechanically robust as per Standard Inspection & Test Schedule 903-000-026.

PASS

TESTED BY : \_\_\_\_\_ DATE : \_\_\_\_\_

## 8. CONNECTION DIAGRAM

