159-058-901
Sheet 1 of 7

Order Number | | Serial Number | |

PRODUCT/TEST MANUAL

2C58K1

INSTANTANEOUS OVERCURRENT RELAY

Issue Level	Date	Summary of changes
A	28/01/1997	Initial issue.

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

Document updated	Checked	Registered	.pdf file created	.pdf uploaded to web site

1. BROAD DESCRIPTION

The 2C58K1 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 110V DC 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. SPECIFICATION

Auxiliary Supply Voltage	110V DC +20% -30%
Auxiliary Supply Burden (at 110V)	<3W output relay dropped out <11W output relay picked up
Nominal Input Current	1A
Sensing Supply Burden (at 1A)	<0.1VA
Nominal setting Range	20%-80% continuously variable per pole
Number of Poles	3 (with common output)
Frequency Tolerance	-6% to +2% of 50Hz
Ambient Temperature Range	$-5^{o}C$ to $55^{o}C$
Accuracy	$<\pm$5% of maximum setting
Dropout/Pickup Ratio	85% Nominal
Withstand Current (independent of setting)	5A continuous 20A 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

2. SPECIFICATION (Cont)

Output Relay Contact Ratings

Make and Carry Continuously
3000 VA AC resistive with maximums of 660 Volt and 12 Amp
3000 VA DC resistive with maximums of 660 Volt and 12 Amp

Make and Carry of 0.5 Second
7500 VA AC resistive with maximums of 660 Volt and 30 Amp
7500 VA DC resistive with maximums of 660 Volt and 30 amp

AC Break Capacity
3000 VA AC resistive with maximums of 660 Volt and 12 Amp

DC Break Capacity (Amps)

Voltage			**24V**	**48V**	**125V**	**250V**
Resistive rating		**a** **b**	12 12	1.5 12	0.5 10	0.25 5
L/R=40mS	Maximum break	**a** **b**	12 30	1 15	0.4 5.5	0.2 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 Auxiliary Supply
AC Current Supply
AC Ammeter
Electronic Counter (for measuring operate and release times)
Oscilloscope
Decade Boxes
High Voltage Test Equipment

4. ASSOCIATED DRAWINGS

159-058-101	2C58K1 Wiring Diagram
660-093-201	Circuit Diagram - PCB Sensing
660-093-301	Loading Diagram - PCB Sensing

5. HIGH VOLTAGE TESTING

a) Apply 2KV RMS 50 Hz between terminal groups as listed in A & B below for 1 minute.

b) Apply 3 5KV 1/50us pulses of each polarity as listed in A & B below.

Group A	Group B
7,8,10,11,18,22	25,26,40,41,43,44,E
10,11,25,26,43,44	7,8,18,22,40,41,E
7,8,25,26,40,41	18,22,43,44,E

6. CALIBRATION & TEST PROCEDURE

6.1 Current Sensing

Note: The calibration of only one phase of the circuit will be described (Input 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 (158.058.101 reference) avlugs located on Motherboard 660/094-1. The value of R1 determines the value of pickup current at a particular dial setting.

d) Apply auxiliary supply voltage of 110V 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 minimum to maximum 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.

g) Adjust decade box so that relay just picks up at 0.8A for a dial setting of 0.8A.

6.1 Current Sensing (Cont)

h) Check that at the 0.2 A dial setting pickup occurs at this value.

i) Replace decade box with nearest preferred value of fixed resistor and check the following scale calibration points.

MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNIT
0.17	0.23	0.2		A
0.37	0.43	0.4		A
0.57	0.63	0.6		A
0.77	0.83	0.8		A

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

Actual	**%**

k) Repeat steps a) to i) for Input B:

Ref b) Terminals 43 & 44 c) R2
e) TP"C", R21 f) TP"D", C15

Minimum	Maximum	Nominal	Actual	Unit
0.17	0.23	0.2		A
0.37	0.43	0.4		A
0.57	0.63	0.6		A
0.77	0.83	0.8		A

l) Check for correct hysteresis.

Actual	%

m) Repeat steps a) to i) for input C:

Ref b) Terminals 40 & 41 c) R3
e) TP"A", R39 f) TP"B", C25

Minimum	Maximum	Nominal	Actual	Unit
0.17	0.23	0.2		A
0.37	0.43	0.4		A
0.57	0.63	0.6		A
0.77	0.83	0.8		A

6.1 Current Sensing (Cont)

n) Check for correct hysteresis.

Actual	%

6.2 Operate Time Check

a) Set input A dial to 0.2A and input A current to 4A.

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

b) Set input B dial to 0.2A and input B current to 4A.

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

c) Set input C dial to 0.2A and input C current to 4A.

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

7. GENERAL & FUNCTIONAL

a) Check that unit operates satisfactorily over the range of 75% to 115% auxiliary supply.

b) Check that R7 and R8 have been correctly loaded on mother board.

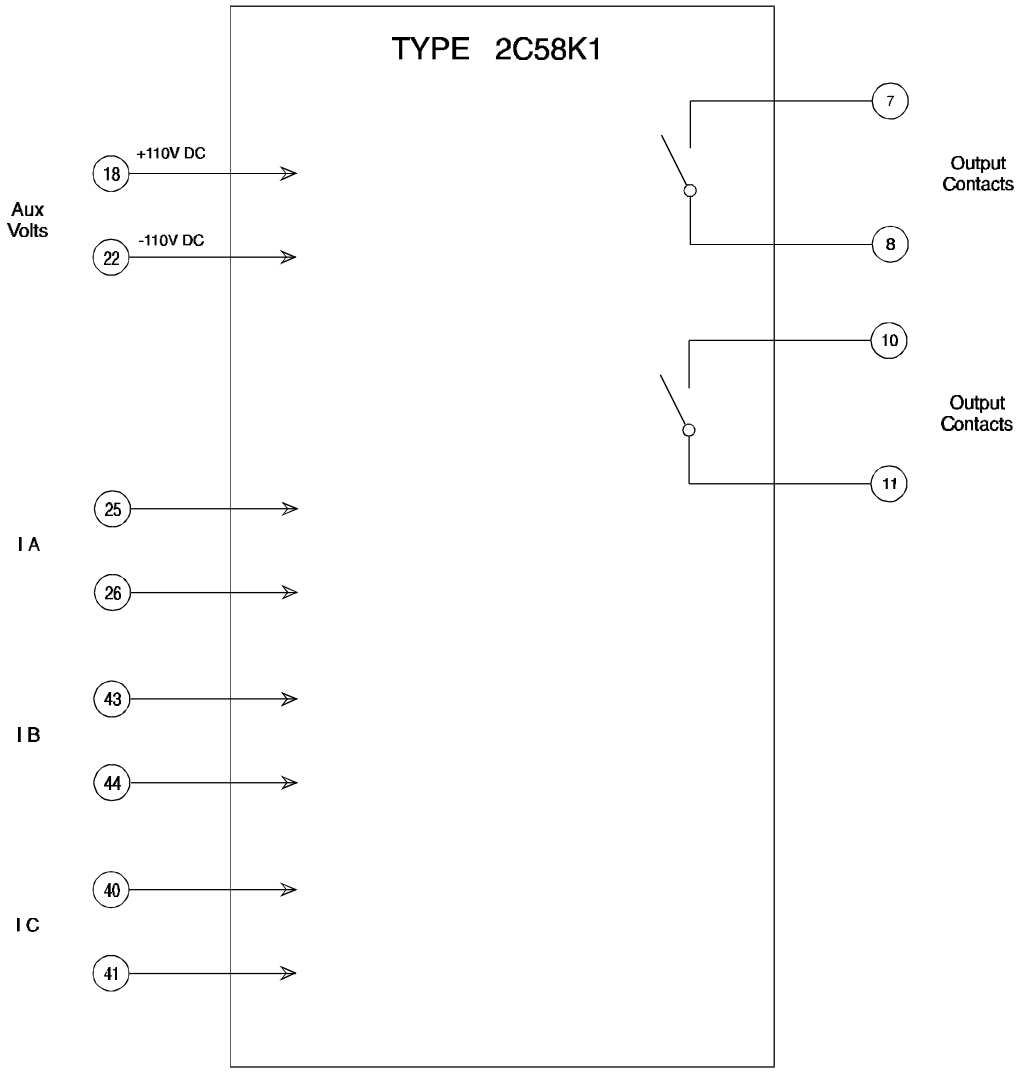
c) Check that quiescent current at 110V is 26mA ±10% with output relay dropped out and 100mA with output relay picked up.

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


TYPE 2C58K1
+110V DC
18
Aux
Volts
-110V DC
22
25
I A
26
43
I B
44
40
I C
41
7
Output
Contacts
8
10
Output
Contacts
11