

Order Number

Serial Number

## PRODUCT/TEST MANUAL

**2C58K29**

**INSTANTANEOUS OVERCURRENT RELAY**

<b>Issue Level</b>	<b>Date</b>	<b>Summary of changes</b>
B	18/04/1996	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 2C58K29 is a triple-pole single output instantaneous overcurrent relay having less than 20ms operate and 15ms release times at 20V setting current. Heavy duty output contacts capable of breaking 0.5A at 125V 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. SPECIFICATIONS

Auxiliary Supply Voltage	110V DC	+20% -30%
Auxiliary Supply Burden (at 110V)	4W output relay dropped out 15W output relay picked up	
Nominal Input Current	1A	
Sensing Supply Burden (at 1A)	0.1VA	
Nominal Setting Range	20%-80% 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	70% Nominal	
Withstand Current (independent of setting)	5x maximum continuous 20x maximum 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. SPECIFICATIONS (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	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 Auxiliary Supply  
AC Current Supply  
AC Ammeter  
Electronic Counter (for measuring operate & release times)  
Oscilloscope  
Decade Boxes  
High Voltage Test Equipment

## 4. ASSOCIATED DRAWINGS

158-058-129	2C58K29 Wiring Diagram
660-093-204	Circuit Diagram Current Sensing PCB
660-093-301	Loading Diagram Current Sensing PCB

## 5. HIGH VOLTAGE TESTING

- a) Apply 2KV RMS 50 Hz between terminal groups 1 and 2 in table 1 for 1 minute.
- b) Apply 3 5KV 1/50us pulses of each polarity between terminal groups 1 and 2 in table 1.

**GROUP A**  
1,2,5,6,7,8  
7,8,9,10,11,12  
1,2,9,10,19,20

**GROUP B**  
9,10,11,12,19,20,E  
1,2,5,6,19,20,E  
5,6,11,12,E

## 6. CALIBRATION & TEST 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 660.093.204.

- a) Adjust pot knob for equal overtravel at scale ends if necessary.
- b) Apply scale minimum current through input A (terminals 9 & 10).
- c) Connect a decade box across R1 (159-058-129 reference) avlugs located on motherboard 660/105.1. 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 carries by a factor of our to one in amplitude as the dial pot is moved from in. 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 (i.e. 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.
- h) Check that at the 0.2A Dial setting, pickup occurs at this value.

### 6.1 Current Sensing (Cont)

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

Minimum	Maximum	Nominal	Actual	Unit
.17	.23	.2		A
.37	.43	.4		A
.57	.63	.6		A
.77	.83	.8		A

- j) Check that hysteresis is between 67% and 74%. Repeat (f) if not.

Actual	Unit
	%

- k) Repeat steps a) - j) for input B.

Ref	b) Terminals 19 & 20	c) R2
	e) TP'C' R21	f) TP'D' C15

Minimum	Maximum	Nominal	Actual	Unit
.17	.23	.2		A
.37	.43	.4		A
.57	.63	.6		A
.77	.83	.8		A

- l) Check for correct hysteresis.

Actual	Unit
	%

- m) Ref b) Terminals 11 & 12 c) R37  
e) TP'A' R39 f) TP'B' C25

Minimum	Maximum	Nominal	Actual	Unit
.17	.23	.2		A
.37	.43	.4		A
.57	.63	.6		A
.77	.83	.8		A

- n) Check for correct hysteresis.

Actual	Unit
	%

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

PU time 19ms @ aux. supply 80V	<input type="text"/>	ms
DO time 14ms @ aux. supply 150V	<input type="text"/>	ms

- b) Set input A dial to 0.8A and input A current to 16A.

PU time 19ms @ aux. supply 80V	<input type="text"/>	ms
DO time 14ms @ aux. supply 150V	<input type="text"/>	ms

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

PU time 19ms @ aux. supply 80V	<input type="text"/>	ms
DO time 14ms @ aux. supply 150V	<input type="text"/>	ms

- d) Set input B dial to 0.8A and input B current to 16A.

PU time 19ms @ aux. supply 80V	<input type="text"/>	ms
DO time 14ms @ aux. supply 150V	<input type="text"/>	ms

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

PU time 19ms @ aux. supply 80V	<input type="text"/>	ms
DO time 14ms @ aux. supply 150V	<input type="text"/>	ms

- f) Set input C dial to 0.8A and input C current to 16A.

PU time 19ms @ aux. supply 80V	<input type="text"/>	ms
DO time 14ms @ aux. supply 150V	<input type="text"/>	ms

## 7. GENERAL & FUNCTIONAL

Check that R7 and R8 have been correctly loaded on Motherboard.

Check that quiescent current at 110V is 26mA  $\pm$ 10% with output relay dropped out and 110mA with output relay pick up.

## 7. GENERAL & FUNCTIONAL (Cont)

159-058-929  
Sheet 7 of 8

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

