

159-149-926  
Issue A 14/11/1996  
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Order Number

Serial Number

## PRODUCT / TEST MANUAL

**2C149K26**

**DEFINITE TIME OVERCURRENT RELAY**

<b>Issue Level</b>	<b>Date</b>	<b>Summary of changes</b>
A	14/11/1996	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 2C149 is an instantaneous AC overcurrent relay available as a 1, 2 or 3 pole unit with either individual output relays or a common output relay. Two or four normally open output contact pairs per relay may be provided and magnetic disc flagging may be provided for each relay, if required.

The 2C149 has an inbuilt adjustable time delay. The output from the current sensing circuitry is used to enable a timer, resetting it if the overcurrent condition disappears. An instantaneous output relay may be provided if required. Magnetic disc flagging of instantaneous and timed output relays is also available.

## 2. SPECIFICATION

Auxiliary Supply Voltages available D110/125, D250	+20% -30%
Nominal Input Currents	1A, 5A 50Hz
Nominal Setting Ranges	50-200%
Accuracy	±5% of maximum setting
Pickup/Dropout Ratio	80% Nominal
Withstand Current (Independent of setting)	5 x Maximum setting cont. 20x Maximum setting 3 Sec.
Ambient Temperature Range	-5°C -55°C
Burden	Less than 1VA per phase
Time Ranges	0.1 - 1
Output Relay Contacts 30R	2 N/O Standard
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

## 2. SPECIFICATION (Cont)

### 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 Power Supply  
AC Current Source  
AC Ammeter  
Electronic Counter (for measuring period)  
Oscilloscope

## 4. ASSOCIATED DRAWINGS

159-149-126	Definite Time Overcurrent Relay 2C149K26
660-043-201	Circuit Diagram PCB - Instantaneous Overcurrent Relay
660-043-301	Component Loading - Instantaneous Overcurrent Relay
660-043-401	Parts List - Instantaneous Overcurrent Relay
660-044-201	Circuit Diagram PCB - Timer & Magnetic Disc Flag Driver
660-044-301	Component Loading - Timer & Magnetic Disc Flag Driver
660-044-401	Parts List - Timer & Magnetic Disc Flag Driver

## 5. HIGH VOLTAGE TESTING

- a) Apply 5 consecutive impulses between all terminals connected together and frame.
- b) Apply 2 consecutive impulses of each polarity between Terminals 1 and 2 (auxiliary supply terminals).
- b) Apply 2000V RMS between all terminals tied together and frame, for 1 minute.

## 6. CALIBRATION & TEST PROCEDURE

### 6.1 Instantaneous Overcurrent PCB

**Note:** The calibration of only one phase of the circuit will be described (Input No 1). Component reference numbers refer to Figure 1.

- a) Apply scale minimum current through input 1 (terminals 9 and 10).
- b) Set input 1 dial pot to minimum setting.
- c) Connect an oscilloscope between the junction of D11 and R5 and pin 27 of the plug-in board (i.e. Aux-ve) to monitor the 3 phase bridge output.
- d) Connect a decade box across R1a avlugs and adjust until the most even three phase full wave rectified type ripple is achieved (as observed on the CRO).
- e) Replace decade box with nearest preferred value of  $\frac{1}{2}W$  fixed resistor and re-check waveform.
- f) Adjust dial pot knob for equal overtravel at each end of the scale.
- g) Apply DC auxiliary supply.
- h) Connect decade boxes across R12 and R18 avlugs.
- i) Set input current and dial pot setting to scale maximum current.
- j) Adjust R12 decade box until the correct scale span is achieved disregarding the absolute values of pick up current.

### 6.1 Instantaneous Overcurrent PCB (Cont)

- k) Adjust R18 decade box until the scale maximum pick up current is

calibrated. Repeat step (j) if necessary.

- l) Replace decade boxes with fixed resistors and check mid and scale-end calibrations.
- m) Check that PU and DO times are within tolerance at 5X maximum setting current (at both minimum and maximum scale settings).
- n) Repeat above procedure for other phase(s) (if fitted).

## 6.2 Timer PCB

**Note:** Component reference numbers refer to Figure 6.

- a) Adjust the time setting pot knob for equal overtravel at each end of the time scale.
- b) Connect a frequency counter (or period counter) to PCB 660/044 pin 11 (negative to aux-ve).
- c) Adjust R10 until the ratio of maximum to minimum frequency at scale ends is equal to the ratio of minimum to maximum scale end times.
- d) Set dial pot to maximum time setting.
- e) Select C3a to give a frequency equal to or slightly lower than that required for maximum time.

## 6.2 Timer PCB (Cont)

- f) Trim R7 and R9 if necessary to bring maximum time to desired value.
- g) Check minimum time and re-adjust R10 if necessary.
- h) Check that mid and scale-end times are within tolerance.

## 7. GENERAL & FUNCTIONAL

- a) Check that unit operates satisfactorily over specified auxiliary supply voltage range.

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- b) 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

