

Order Number

Serial Number

PRODUCT / TEST MANUAL

2C58K46

INSTANTANEOUS OVERCURRENT

Issue Level	Date	Summary of changes
D	09/04/1998	Initial issue.

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ERL	MW	MW	

1. DESCRIPTION OF RELAY

The 2C58K46 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 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. SPECIFICATION

Auxiliary Supply Voltage	110V DC +20% -30%
Auxiliary Supply Burden (at 125V)	4W output relay dropped out 15W output relay picked up
Nominal Input Current	1A
Sensing Supply Burden (at 1A)	<0.1VA
Nominal Setting Range	5% - 20% 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	not less than 85%
Withstand Current (independent of setting)	10A continuous 40A 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

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

2. SPECIFICATION (Cont)

AC Break Capacity

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

DC Break Capacity (Amps)

Voltage			24V	48V	125 V	250V
Resistive rating		a	12	1.5	0.5	0.25
		b	12	12	10	5
L/R=40 mS	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 and release times)
 Oscilloscope
 Decade Boxes
 High Voltage Test Equipment

4. ASSOCIATED DRAWINGS

For energyAustralia only

This Product Test Manual is in reference to TfA 153098 Issue A 6/04/96

159-058-146	2C58K46 Wiring Diagram
660-093-208	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 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
 25,26,43,44,40,41,18,22
 25,26,40,41,7,8,12,13
 25,26,43,44,7,8,10,11
 All terminals

Group B
 7,8,10,11,12,13,16,17
 43,44,18,22,10,11,16,17
 40,41,18,22,12,13,16,17
 Earth/Frame

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 660.093.208.

- 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 (158.058.146 reference) avlugs located on Motherboard 660/94-401. 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 0.2A for a dial setting of 0.2A.
- h) Check that at the 0.05A 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
40	60	50	<input type="text"/>	mA
90	110	100	<input type="text"/>	mA
140	160	150	<input type="text"/>	mA
190	210	200	<input type="text"/>	mA

- j) Check that hysteresis is not less than 85% of pick up on above settings Repeat f) if not.

Actual %

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

Ref b) Terminals 43 & 44
 e) TP"C", R21

c) R2
 f) TP"D", C15

Minimum	Maximum	Nominal	Actual	Unit
40	60	50	<input type="text"/>	mA
90	110	100	<input type="text"/>	mA
140	160	150	<input type="text"/>	mA
190	210	200	<input type="text"/>	mA

- l) Check that hysteresis is not less than 85% of pick up on above settings Repeat f) if not.

Actual %

6.1 Current Sensing (Cont)

- 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
40	60	50	<input type="text"/>	mA
90	110	100	<input type="text"/>	mA
140	160	150	<input type="text"/>	mA
190	210	200	<input type="text"/>	mA

- n) Check that hysteresis is not less than 85% of pick up on above settings Repeat f) if not.
Actual %

6.2 Operate Time Check

- a) Set input A dial to 0.05A and input A current to 1A.

PU time <19 ms @ aux. supply 77V	<input type="text"/>	ms
DO time <14 ms @ aux. supply 132V.	<input type="text"/>	ms

- b) Set input B dial to 0.05A and input B current to 1A.

PU time <19 ms @ aux. supply 77V	<input type="text"/>	ms
DO time <14 ms @ aux. supply 132V.	<input type="text"/>	ms

- c) Set input C dial to 0.05A and input C current to 1A.

PU time <19 ms @ aux. supply 77V	<input type="text"/>	ms
DO time <14 ms @ aux. supply 132V.	<input type="text"/>	ms

7. GENERAL & FUNCTIONAL

- a) Check that unit operates satisfactorily over the range of 77 to 132 auxiliary supply.
- b) Check that R7 and R8 have been correctly loaded on mother board.
- 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.
- e) For EnergyAustralia check that the relay is identified with SC 150847

PASS

TESTED BY : _____ DATE : _____

8. CONNECTION DIAGRAM

