Accreditation
No. 47

This laboratory is accredited by the National Association of Testing Authorities, Australia.
The tests reported herein have been performed in accordance with its terms of accreditation.

TEST REPORT

Western Power
Standards Laboratory
2/46 Collingwood Street
Osborne Park WA 6017
Tel. 08 9445 0520
Fax. 08 9445 0500

Return To Test Results

Requested By

Brian Snell
Proprietor
Safetac Welding Products
Unit 6/7 Coolibah Way
BIBRA LAKE WA 6163

Date of Test:	15/11/2002
Temperature:	21.4°C
Rel. Humidity:	37%
Customer Ref:	227021;lm013472
Workbook No:	WB20020971

Instrument Details

Test Item:	Voltage Reduction Device (for welders)
Maker:	Safetac Welding Products
Model/Type:	GPDK/GPRK
Serial No.:	VR1345

Preamble

The Test item is a device that reduces the No-LOAD output voltage of an ARC welder from the unreduced no-load voltage to a level deemed safe according to AS3195-1995. For compliance to AS3195-1995 the device must automatically reduce the welder's no-load voltage to a safe level when the resistance of the output exceeds 200 Ω.

The client requested the device be tested to show the resistance level at which the output relay, which controls a welder's output voltage, operates. In addition, the transition time of the relay and the correct operation of the devices' 'OUTPUT STATE' indication were requested.

Method Employed

The control device was fitted into a demonstration case that indicated the transitional states as Red and Green lights. These were operated through a relay contact.

The AC/DC Decade Resistance box was connected across the "SENSE" terminals of the demonstration case. The supply to the case was connected to the "INPUT" terminals.

The transition was observed across the relay terminal using a Yokogawa Digital Oscilloscope (ID9.1.9) via a 1.5-volt battery in series with a 500 Ω resistor. *The CRO was set to 'ROLL' mode with a 500ms time-base.*

The tests were initially carried out with a supply of 70 V AC to the Test item. This supply was from the mains using an 8Amp Variac.

A resistance of 80 Ω was initially set on the decade box when the Test item was energised. The Oscilloscope trace indicated the relay in a 'CLOSED' condition with the 'OUTPUT STATE' led, RED. The applied resistance was increased until the relay opened, as viewed on the oscilloscope, and the 'OUTPUT STATE' led, turned GREEN. The value of resistance at which this occurred was recorded. The decade box was re-set to 80 Ω and the test repeated. The transition should occur around the 100 Ω value. A sensitivity adjustment is provided on the control unit to adjust the value at which the transition occurs. During the calibration process the sensitivity was set so that the transition was around the 100 Ω value.

Ten measurements were carried out and the mean of the readings calculated. This value is given in the result table as LOAD TO NO LOAD. A measurement of resistance required to make the Test item go from a NO LOAD (green) condition back to a LOAD (red) condition is also given in the result table as NO LOAD TO LOAD.

The transition time of the relay's operation was measured on the oscilloscope as the time for the contact to operate. The mean of five measurements for each state is given in the result table.

The 'open circuit' voltage of the sense output was measured using a hi-resolution digital multimeter. A 10 GΩ resistor was connected across the "SENSE" terminals with the DMM connected across the resistor. This will give an approximate load of 5 GΩ load. The voltage across the terminals was measured with both the 70 VAC and 70 VDC input.

Uncertainties
At the time of testing the uncertainty of measurement at the 95% confidence level is:

Resistance measurement	±2.0 Ω
Time Measurements	±0.001 seconds

Results

AC Volts Supply

Applied 70 Volts AC ±10Volts

Transition State from LOAD to NO LOAD condition (Indication RED to GREEN state)

Resistance Value at Transition	(Ω)
	99.9

Transition State from NO LOAD to LOAD condition (Indication GREEN to RED state)

Resistance Value at Transition	(Ω)
	99.7

DC Volts Supply

Applied 65 Volts DC ±5Volts

Transition State from LOAD to NO LOAD condition (Indication RED to GREEN state)

Resistance Value at Transition	(Ω)
	96.4

Transition State from NO LOAD to LOAD condition
(Indication GREEN to RED state)

Resistance Value at Transition	(Ω)
	97.4

Transition State from NO LOAD to LOAD condition
(Indication GREEN to RED state)

Measured RISE-TIME of Transition FROM LIVE TO SAFE

(External Resistance 100 TO 200 Ω)	(ms)
	1.8

Measured RISE-TIME of Transition FROM SAFE TO LIVE

Normally closed contact

(External Resistance 200 TO 100 Ω)	(ms)
	1.8

TEST REPORT

VOLTAGE AT 'SENSE' TERMINALS

@ **5 GΩ** Load

Supply voltage 70 Vdc	(Vdc)
Measured Value (Vdc)	**9.30**
Supply voltage 70 Vac	(Vdc)
Measured Value (Vdc)	**12.20**

Approved Signatory **Date:** 19 November, 2002

Testing Officer: Derek Ball