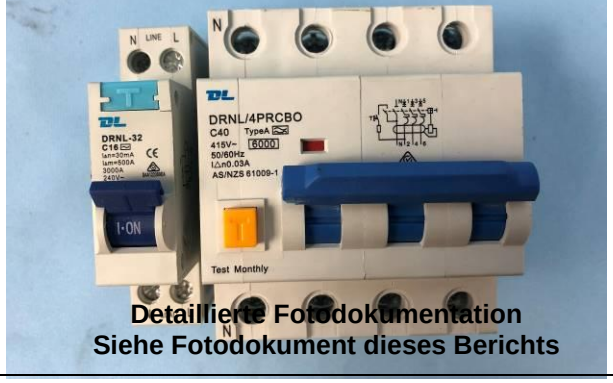
Test Report No.: *Prüfbericht-Nr.:*	**50303698 001**	**Order No.:** *Auftrags-Nr.:*	**252100613**	**Page 1 of 7** *Seite 1 von 7*
Client Reference No.: *Kunden-Referenz-Nr.:*	**705106**	**Order date:** *Auftragsdatum:*	**2019-10-16**	

Client: *Auftraggeber:*	**Sparkelec Pty Ltd** 56 Parramatta Rd, Croydon, NSW 2132, Australia
Test item: *Prüfgegenstand:*	**RCBO**
Identification / Type No.: *Bezeichnung / Typ-Nr.:*	Brand **DL ELECTRIC** and **SPARKELEC** model **DRNL-32** and **DRNL/4PRCBO**
Test specification: *Prüfgrundlage:*	According to ESV "Additional testing and verification requirements for RCBOs" Version 4.0 – last updated July 1st, 2019
Date of receipt: *Wareneingangsdatum:*	**2019-10-29**
Test sample No.: *Prüfmuster-Nr.:*	**A001015373-001 to 004**
Testing period: *Prüfzeitraum:*	**2019-10-29 to 2019-10-29**
Place of testing: *Ort der Prüfung:*	**TÜV Rheinland Australia**
Testing laboratory: *Prüflaboratorium:*	**TÜV Rheinland Australia**
Test result*: *Prüfergebnis*:*	**Pass**

Detailed photo documentation
See photo document section of this report



Detaillierte Fotodokumentation
Siehe Fotodokument dieses Berichts

tested by / *geprüft von*:

Date *Datum*	Name / Position *Name / Stellung*	Signature *Unterschrift*
2019-10-31	Keith Jiang/ Project engineer	Keith Jiang

reviewed by / *kontrolliert von*:

Date *Datum*	Name / Position *Name / Stellung*	Signature *Unterschrift Signature*
2019-10-31	Keivan Mohammadi/ Reviewer	KM

Other / *Sonstiges*:

Condition of the test item at delivery:
Zustand des Prüfgegenstandes bei Anlieferung:

* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
Legende:	*P(ass) = entspricht o.g. Prüfgrundlage(n)*	*F(ail) = entspricht nicht o.g. Prüfgrundlage(n)*	*N/A = nicht anwendbar*	*N/T = nicht getestet*

Test Report
ESV Additional testing and verification requirements for RCBOs"
Version 4.0 – last updated July 1st, 2019

Test item particulars:
Dimension(mm): 78x60x18

General remarks:
1. This report shall not be reproduced, except in full.
2. Details in test data / test plan no. 252100613.
3.Specification applied:
ESV test instruction July 1st,2019
4. Reporting of results herein is in accordance with NATA recommendations taking into account U of M.
(a)For minimum limits - Where measurement is on the limit or above the limit it is deemed to comply. Where measurement is below the limit it is deemed not to comply.
(b) For maximum limits - Where measurement is on the limit or below the limit it is deemed to comply. Where measurement is above the limit it is deemed not to comply.
5.For reporting of results the estimated uncertainty for measurement taken into account at 95% confidence level.
6.This test report is based on assessment and tests applied to the specific test item(s) as submitted by the client. TÜV Rheinland Australia disclaims any and all responsibility or obligation for any other item.

Description of the test item:
Brand **DL ELECTRIC** model **DRNL-32, RCBO type AC,** Rating: 240V, 16A, a.c., C16, 30mA, and 3 kA
Brand **DL ELECTRIC** model **DRNL/4PRCBO, RCBO type A,** Rating: 415V, 40A, a.c., C40, 30mA, and 6 kA
Brand **SPARKELEC** with the same model numbers as above are identical to brand **DL ELECTRIC**.

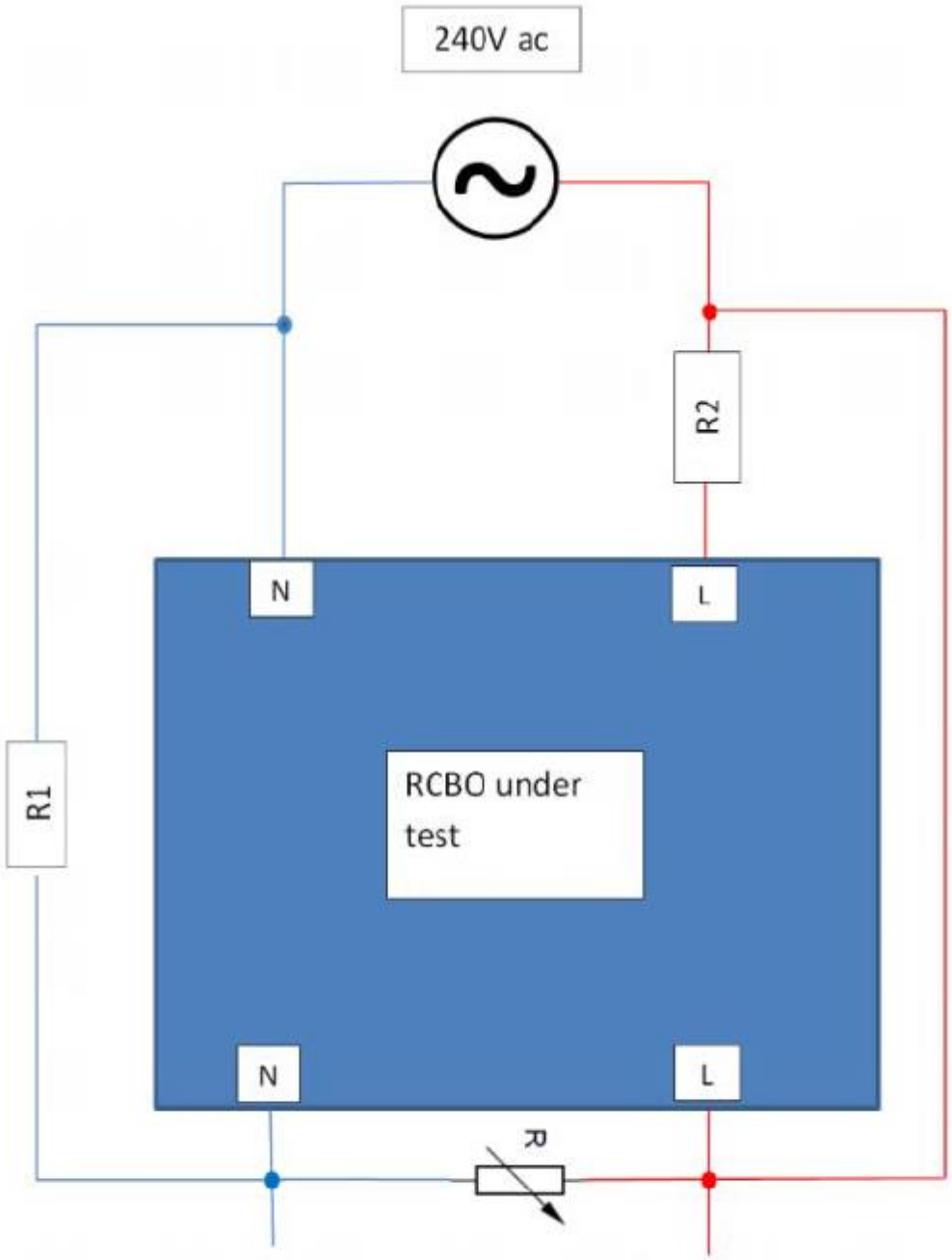
Model Variations:
Same model numbers with different current rating of 10A,16A,20A,25A,32A and 40A

History of revision:
N/A

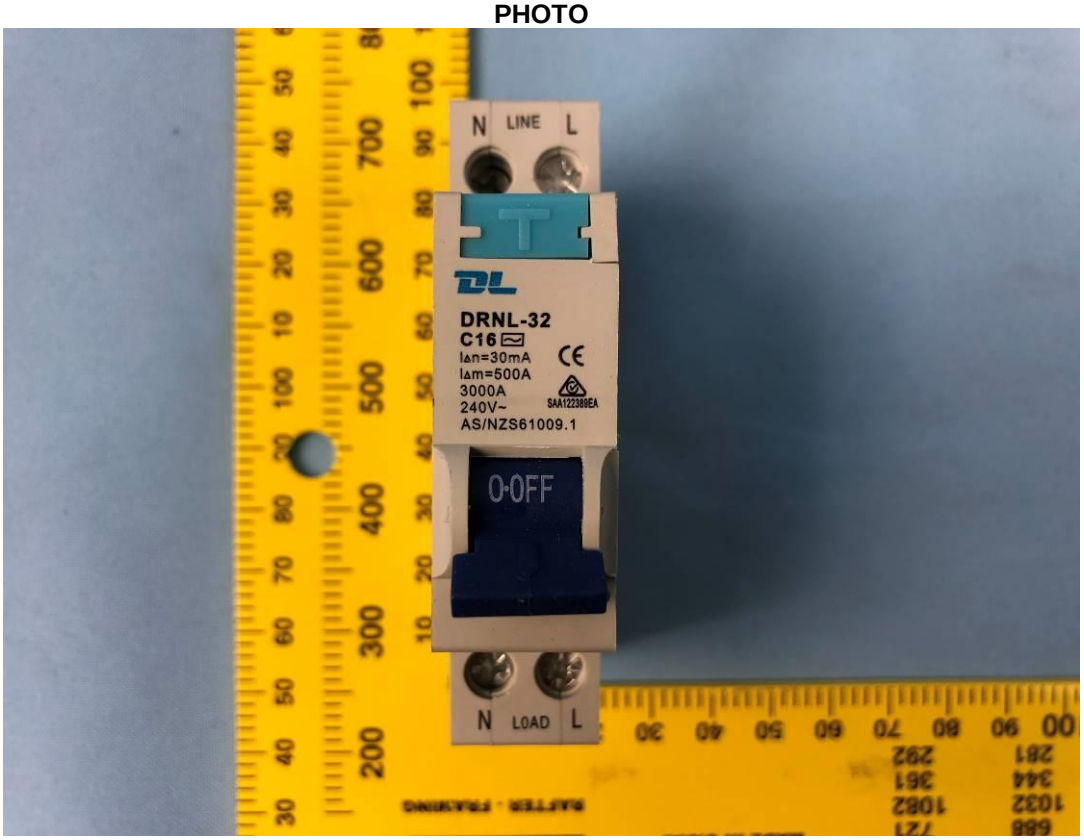
Options/accessories/ancillary equipment:
The equipment was tested without any optional accessory installed. Hence, this report does not cover parameters that are influenced by the installation of optional accessory that might affect safety in the meaning of this standard.

Additional testing and verification requirements for RCBOs" Version 4.0 – last updated July 1st, 2019			
Clause	Requirement + Test	Result - Remark	Verdict
1	The RCBO in the closed position is to be set up as per the circuit diagram below to have 240V applied on both L and N terminals. The link between the terminals shall be as short as practicable. The variable resistor R value is reduced so that adequate residual current is passed through the circuit until the RCBO trips. This current is applied for 60 seconds.	Model DRNL-32 tripped at 21.5mA and model DRNL/4PRCBO tripped at 30.9mA, this current applied for 60 seconds in total even when test items tripped	P
2	If the RCBO can be reset, the RCBO is setup as per test (1), however the variable resistor is disconnected from the circuit. The RCBO is closed and the test button is pressed and released.	RCBO reset, test button pressed and released: 1- Model DRNL-32 tripped 2- Model DRNL/4PRCBO did not trip	P
3	If the RCBO can be reset, step 2 is repeated but the test button is held down for 10 seconds.	Step 3 is conducted only for Model DRNL-32	P
4	If the RCBO trips then step 2 is repeated.	Step 2 repeated only for Model DRNL-32	P
Verification requirements			
	After these tests a verification of the operating characteristics under residual current conditions of the RCBOs is to be performed by the test set out in clause 9.9.1.2 a), of AS/NZS 61009:2015. The RCBO is required to comply with clause 9.9.1.2 a), of AS/NZS 61009:2015, any damage to the test button or its circuits is ignored.	Test button was not working in Model DRNL/4PRCBO and it was ignored	P
	a) Verification of the correct operation in case of a steady increase of the residual current		P
	The test switches S1 and S2 and the RCBO being in the closed position, the residual current is steadily increased, starting from a value not higher than 0.2 $I_{\Delta n}$, trying to attain the value of $I_{\Delta n}$ within 30 s, the tripping current being measured each time.		P
	All five measured values shall be situated between $I_{\Delta no}$ and $I_{\Delta n}$.	15<limit<=30, For Model DRNL-32measured tripping time was within limit min. 22.5 and Max. 21.6.ms For Model DRNL/4PRCBO measured tripping time was within limit min. 23.5 and Max. 23.8ms.	P

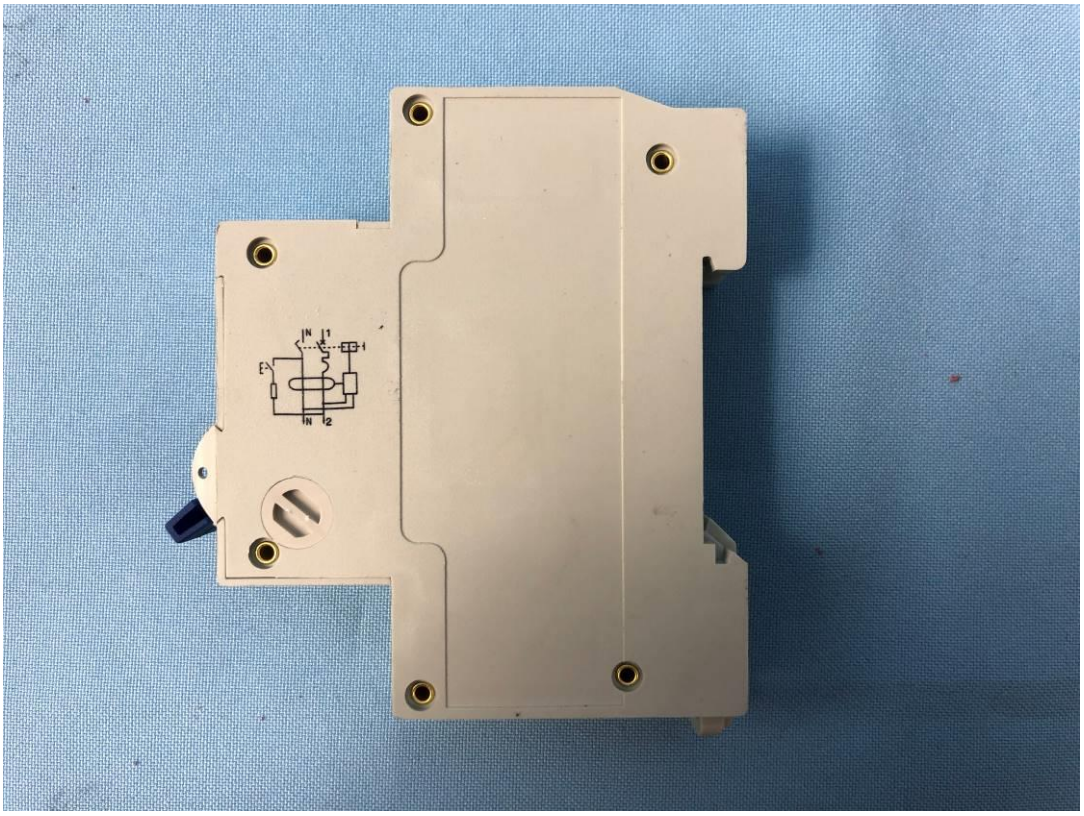
Test circuit



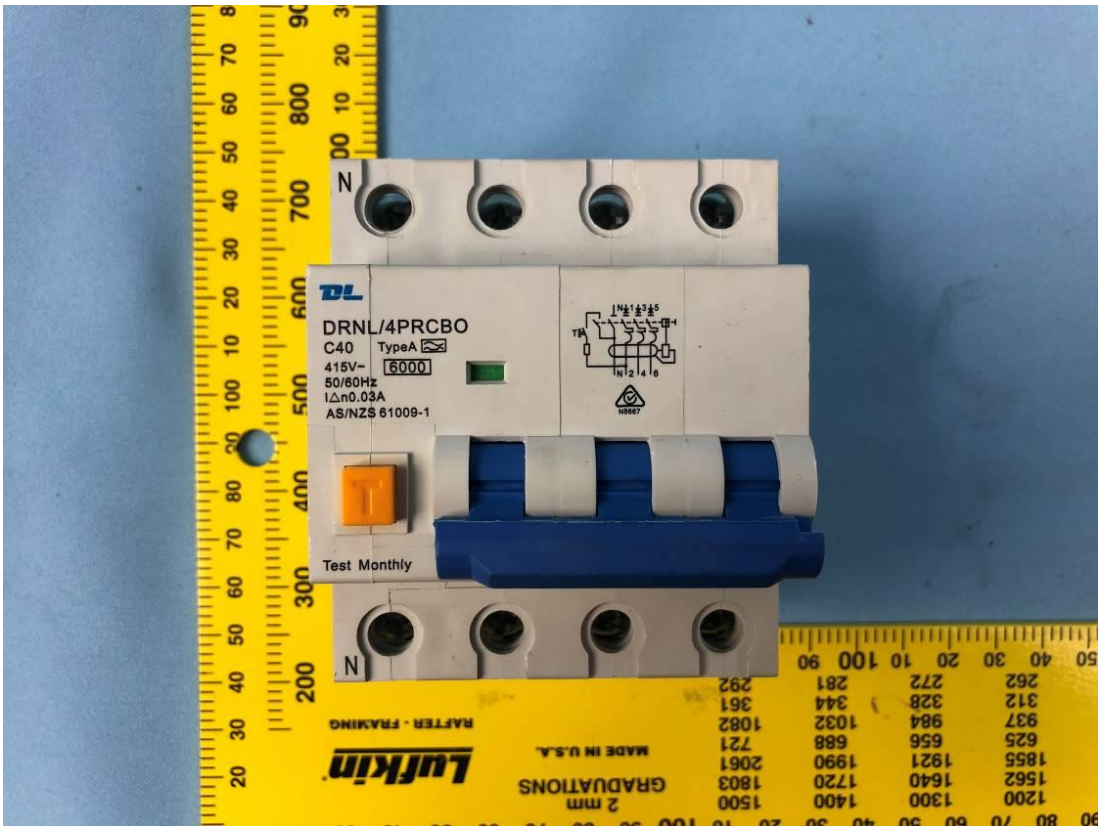
PHOTO



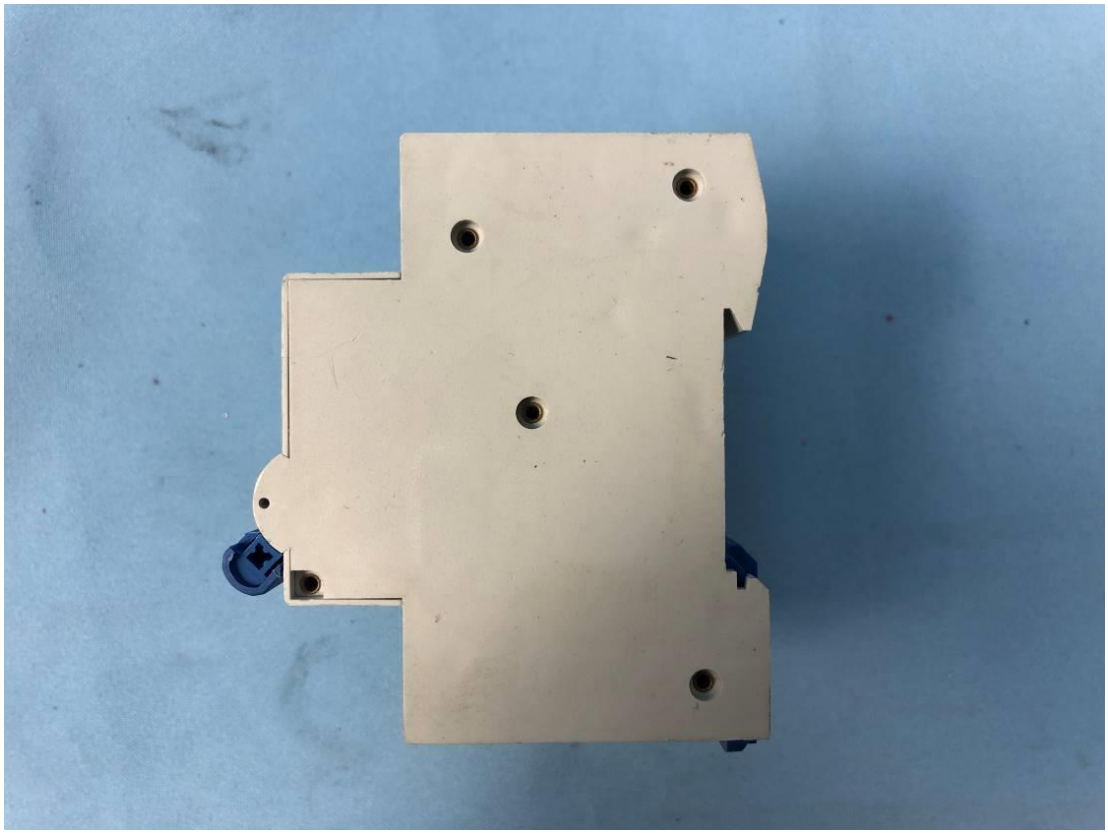
Test sample Model DRNL-32/Front view



Test sample Model DRNL-32/Side view



Test sample Model DRNL/4PRCBO/Front view



Test sample Model DRNL/4PRCBO /Side view

Photo from RCBOs with brand SPARKELEC showing Identical to brand DL ELECTRIC
Note: This photo is just informative

END OF TEST REPORT