



ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

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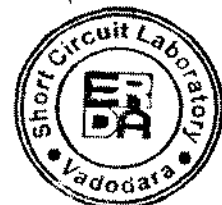


TEST REPORT

SHEET 1 OF 7

NAME & ADDRESS OF CUSTOMER SIEMENS LIMITED A&D CDPD (SGR) KALWA WORKS THANE BELAPUR ROAD THANE - 400 601. INDIA.	REPORT No. PLV/10/SC/225 DATE: 30.06.2005	
	CUSTOMER REF.No.: NIL.	DATED: 16.06.2005
	DATE OF SAMPLE RECEIPT: 16.06.2005	DATE OF TESTING: 17.06.2005 to 18.06.2005
	SAMPLE DESCRIPTION LOW VOLTAGE AIR CIRCUIT BREAKER (4 POLE WITHDRAWABLE DESIGN WITH GUIDE FRAME) Rated current of frame size (In) : Min. : 2000 A , Max. : 3200 A Constructional break at 2500 A., Frame Size : II Permissible load at 40°C. : 2000 A to 3200A. Rated operational voltage (Ue) : 440 V ac , No of poles : 4 Frequency : 50/60 Hz., Ui : 1000 V ac Ics = Icu = 65 kA at 440 V ac , Icw = 60 kA/1.0 sec. Terminals : Unmarked, Utilization Category : B Quantity (Tested) : 3200 A : 1 No. Name of manufacturer : Siemens Limited, China. Further details as per sheet No. 3 of 7	
SAMPLE IDENTIFICATION ERDA ID. No. : LSCLWO 0031433/02 TYPE DESIGNATION : 3WT82 06, 3WT82 56, 3WT83 26 SR.No.: 3WT83 26 Sr.No. 7200250126013 DRAWING No. : 4D-0250-0000001 (Sheet 2 & 4) 4P-0250-0000002, 4P-0250-0000003 3G-0250-0000006, 3G-0250-0000007		
TEST DETAILS Annex H (Test sequence for circuit-breakers for IT Systems) 1.0 Individual pole short-circuit (I _{TR}) Cl. No. H.2 2.0 Verification of dielectric withstand Cl. No. H.3 3.0 Verification of overload releases Cl. No. H.4 ENCLOSURES: NUMBER OF OSCILLOGRAM : TEN NUMBER OF PHOTOGRAPH : ONE NUMBER OF TEST CIRCUIT DIAGRAM : ONE NUMBER OF DRAWINGS : TOTAL SIX SHEETS TEST WITNESSED BY : Mr. Bhavesh Mistry , Siemens Limited, India A&D CDPD (SGR). REMARKS : The sample conforms to the requirements of Annex H (Test sequence for circuit breakers for IT systems) as per standard.		TEST SPECIFICATIONS IEC 60947-2 Third edition 2003-04.
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- NOTE: 1. This report relates only to the particular sample received for testing in good condition at ERDA.
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 3. Publication of this report requires prior permission in writing from Director, ERDA.
 4. Only test asked for by party have been carried out.



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REPORT NO. : PLV/10/SC/225
DATE : 30.06.2005

SHEET 2 OF 7

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Prospective values for Individual pole short-circuit (I_{rr})	Sheet No. 4 of 7
Individual pole short-circuit (I_{rr})	Sheet No. 5 of 7
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Verification of overload releases	Sheet No. 7 of 7
Oscillogram No.	243/01 to 10
Photograph No.	0031433/189
Test circuit diagram No.	OLSC/SWG/117
Drawing No.	4D-0250-0000001 (Sheet 2 & 4) 4P-0250-0000002 4P-0250-0000003 3G-0250-0000006 3G-0250-0000007

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SHEET 3 OF 7

DATE : 30.06.2005

TECHNICAL SPECIFICATIONS ASSIGNED BY CLIENT

1. Name of manufacturer : Siemens limited, China.
 2. Equipment : Low Voltage Air Circuit Breaker (ACB)
(4 Pole Withdrawable design with guide frame)
 3. Standard No. : IEC 60947-2 Third edition 2003-04
 4. Type designation : 3WT82 06, 3WT82 56, 3WT83 26
 5. Sr. No. : 3WT83 26 Sr.No. 7200250126013
 6. Rated operational voltage (Ue) : 440 V ac
 7. Rated current of frame size (In) : 2000 A to 3200 A (Size - II)
 8. Constructional break at : 2500 A
 9. Permissible load at 40°C : 2000 A to 3200 A
 10. Number of poles : 4
 11. Utilization category : B
 12. Rated frequency : 50/60 Hz.
 13. Rated insulation voltage (Ui) : 1000 V ac
 14. Rated impulse withstand voltage (Uimp) : 8 kV
 15. Rated service short-circuit breaking capacity (Ics) : 65 kA at 440 V ac
 16. Rated ultimate short-circuit breaking capacity (Icu) : 65 kA at 440 V ac
 17. Rated short-circuit making capacity (Icm) : 143 kAp at 440 V ac
 18. Rated short-time withstand current and short-time delay (Icw) : 60 kA for 1 sec.
 19. Terminals : Unmarked
 20. Type of release : Microprocessor based overcurrent release type ETU5WT
Temperature independent
- Inverse time-delay function ('a' release): Current range (Ir) : 0.4In to 1.0In.
 Trip time curve : Tc=2 to 30 sec. @ 6 Ir
 Trip time at 100% overload : 20 sec. To 50 sec.
 (Individual pole)
- Definite time delay function ('Z' release) : Current range(I_{sd}) = 1.25 x Ir to 12 x Ir,
 Trip Time Delay (tsd):: 20millisec. to 400millisec.
- Instantaneous trip function ('n' release) : Current Range(Ii) : > 1.5xIn to 20x In and 'OFF' setting
21. Suitability for Isolation : Yes
 22. IP code : IP00 (circuit breaker)/ IP54 (enclosed)
 23. Pollution degree / Material group : 3 / IIIb
 24. Rated control circuit voltage of closing device : 220-240 V ac / 220-250V dc
 25. Rated control circuit voltage of the shunt release & under voltage release : 220-240 V ac / 220-250V dc
 26. Rating of auxiliary circuit
 No. of contacts : 2 NO + 2 NC
 Rated operational current : 10A (AC12) upto 400 V ac
 Rated insulation voltage : 400 V ac
 Impulse withstand voltage : 4 kV
 27. Quantity (Tested) : 3200 A : 1 No.

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REPORT NO. : PLV/10/SC/225

SHEET 4 OF 7

DATE : 30.06.2005

TEST RESULTS:

PROSPECTIVE VALUES FOR INDIVIDUAL POLE SHORT -CIRCUIT (I_{IT})

Supply Frequency : 50 Hz.

Oscillogram No.	Test voltage (Vrms)	Short circuit current values (kA)		Power factor	Remarks
		Peak	Rms		
243/01	-	101	47.87	0.25	Calibration shot for current measurement
243/02	462	-	-		Calibration shot for voltage measurement

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SHEET 5 OF 7

DATE : 30.06.2005

INDIVIDUAL POLE SHORT -CIRCUIT (I_{IT}):

(Cl.No. H.2)

Condition of samples before test: New. The samples were connected to source as per test circuit diagram No.: OLSC/SWG/117

Time delay setting : 400 millisecc.(Max.)

Supply frequency : 50 Hz.

Pole No.	Oscillo-gram No.	Operation	Applied Voltage (Vrms)	Short Circuit Current (kA)		Tripping Time (msecs.)	I ² t Value (A ² S x 10 ⁹)
				Peak	RMS		
4	243/03	O - 3'	-	110.6	47.85	459.3	1.114
	243/04	CO	462	76.16	47.82	450.0	1.039
3	243/05	O - 3'	-	101.0	47.81	459.5	1.136
	243/06	CO	462	106.9	47.83	457.4	1.101
2	243/07	O - 3'	-	104.8	47.79	462.0	1.098
	243/08	CO	462	69.44	47.85	437.3	1.012
1	243/09	O - 3'	-	101.0	47.89	439.3	1.071
	243/10	CO	462	100.2	47.83	454.8	1.062

Note : Recovery voltage of 462 Vrms was maintained for > 0.1 sec. in each operation on sample.

Condition of samples during test: No abnormality was observed.

After test : - No abnormality was observed.

- Fine wire fuse in the earth circuit was intact.
- ACB was operable on no load.
- Withdrawability of ACB was checked & found satisfactory.

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SHEET 6 OF 7

VERIFICATION OF DIELECTRIC WITHSTAND (Cl. No. H.3)

Condition of samples before test: As after individual pole short -circuit (I_{TT}). The test was carried out on sample.

Sr. no.	Test	Applied voltage (kV)	Duration (sec.)	Remarks
a)	With the circuit breaker in closed position			
i)	Between all live parts of all poles connected together and frame of the circuit breaker	1.00	60	Withstood
ii)	Between each pole and all other poles connected to the frame of the circuit breaker	1.00	60	Withstood
b)	With the circuit breaker in open / tripped position			
i)	Between all live parts of all poles connected together and the frame of circuit breaker	1.00	60	Withstood
ii)	Between the terminals of one side connected together and the terminals of the other side connected together	1.00	60	Withstood

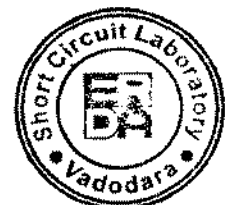
VERIFICATION OF LEAKAGE CURRENT OF EQUIPMENT SUITABLE FOR ISOLATION (Cl. No. H.3)

Condition of samples before test: As after verification of dielectric withstand.

Pole No.	Measured on parts of equipment (ACB was in open position)	Applied Voltage 1.1Ue (Volt)	Limits (milliamp)	Measured Value (milliamp.)
1.	Across each contact	484	≤ 2	0.00211
2.	Across each contact	484	≤ 2	0.00200
3.	Across each contact	484	≤ 2	0.00180
4.	Across each contact	484	≤ 2	0.00261

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SHEET 7 OF 7

VERIFICATION OF OVERLOAD RELEASES

(Cl.No. H.4)

Condition of samples before test : As after verification of leakage current of equipment suitable for isolation.

Reference amb. temp. (°C)	Release Setting (Amp)	Test current 2.5 x Release Setting (Amp)	Tripping time (sec.)				
			Specified (Max.)	Measured on individual pole			
				Pole-1	Pole -2	Pole -3	Pole-4
37.6	0.4 In=1280	3200	30	19.84	19.53	19.22	18.60

RESULTS: Tripping time measured was within the limit specified by the standard.

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