



CENTRAL POWER RESEARCH INSTITUTE

SWITCHGEAR TESTING & DEVELOPMENT STATION

GOVINDPURA, BHOPAL - 462 023, INDIA

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NABL ACCREDITED
LABORATORY

Certificate Number. 2003/STN-1/339

Sheet No. 1 of 15

Dated 20 JAN 2004

TYPE TEST CERTIFICATE FOR SHORT CIRCUIT PERFORMANCE

Apparatus : An unenclosed four pole drawout type air circuit breaker mounted in a cradle fitted with adjustable microprocessor based electronic overload (long time)/short circuit (short time) releases ($I_n = 5000A$ $U_e = 415V$ AC, 50Hz, $U_i = 1000V$ AC, Utilization category: B)

Designation/Type : CN-CS..C/CN-CS 5000C

Number of sample(s) tested : Two

Manufacturer's serial No(s) : KW 223538, KW 223539

CPRI sample code No(s) : STDSST103S1330, STDSST103S1331

Client : M/s Larsen & Toubro Limited, Post Box No. 8901, Powai, Mumbai – 400 072, India

Manufacturer : M/s Larsen & Toubro Limited, Post Box No. 8901, Powai, Mumbai – 400 072, India

Date(s) of Test(s) : 18th, 22nd, 26th & 31st December, 2003

Tested at : Station-1, CPRI, Bhopal

Test(s) subcontracted and address of the laboratory :-

Following tests were conducted at M/s Larsen & Toubro Limited, Powai Works, Mumbai – 400 072:-

- Verification of temperature rise.
- Verification of overload release (after temperature rise test)

The apparatus constructed in accordance with the description, drawings and photographs incorporated in this sealed certificate has been subjected to the series of proving tests in accordance with IEC:60947-2, 2003.

The results are shown in the Record of Proving Tests and the Oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above standard(s) to justify the ratings assigned by the manufacturer as listed below.

Rated short time withstand current : 76kArms for 1.0 second with a dynamic peak of 167.2kA

Rated service/ultimate short circuit breaking capacity : 76kArms at 415V AC, 0.2 pf.

Peak Ratio : 2.2

This Certificate and Record of Proving Tests applies only to specific piece of apparatus tested from the particular place of manufacturer. The responsibility, for conformity of any apparatus having the same designation with that tested, rests with manufacturer at the place of manufacture of that apparatus.

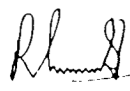
DOCUMENTS CONSTITUTING THIS CERTIFICATE ARE:

Description of apparatus tested on sheet No.	: 2	Apparatus drawing Nos. on sheet No.	: 4
Summary of tests on sheet No.	: 3	Photograph Nos. on sheet No.	: 4
Oscillogram Nos. on sheet No.	: 3	Schedule of test results and note on sheet Nos.	: 5 to 14 & 15
Test circuit diagram numbers on sheet No.	: 3		

TEST WITNESSED BY

- (a) Client's representative : Mr. C.S. Kore, Mr. R.S. Niranjana, Mr. S.N. Cheejwani & Mr. Dikesh Kumar
- (b) Other than client's representative : None


(A.K. Rastogi)
TEST ENGINEER


(B.V. Raghavaiah)
JOINT DIRECTOR
R ST1330-1-4

AUTHORISED SIGNATORY



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Sheet No. 2 of 15

DESCRIPTION OF SAMPLE TESTED
(As assigned by the manufacturer)

Sample	: Air Circuit Breaker
Rated operational voltage (U_n)	: 415 V AC
Rated current (I_n)	: 5000 AMPS
Rated Insulation voltage (U_i)	: 1000V AC
Conventional enclosed thermal current (I_{the})	: 5000 AMPS
Conventional free air thermal current (I_{th})	: 5000 AMPS
No. of phases	: Three with neutral
No. of poles	: Four (Neutral pole identical to other poles)
No. of breaks/pole	: One
Utilization category	: B
Frequency	: 50 Hz
Rated service short circuit breaking capacity (I_{cs})	: 76kArms
Rated ultimate short circuit breaking capacity(I_{cu})	: 76kArms
Rated short circuit making current (I_{cm})	: 167.2kA _{pk}
Rated short time withstand current (I_{cw})	: a) Dynamic : 167.2kA _{peak} b) Thermal : 76kArms for 1.0 second.
Terminals	: Unmarked

Operating mechanism:-

	Closing	Tripping	Charging	Release
Type	Electro Magnetic	Electro Magnetic	Motor/Manual	SR 21 Electronic release (*)
Rated voltage	240 V AC	240 VAC	240 V AC	--
Power	320 VA (Pick up) 50VA (hold on)	800 VA	300 VA	

(*) Details of Release : Micro processor based electronic release, type SR 21

Current rating (I_r) : 0.75A (current supply through 5000/0.75A current transformer mounted on circuit breaker terminals)

Overload (long time) : Maximum setting : ($1 I_r$) ; Minimum setting : ($0.5 I_r$).

Short circuit (short time) : Maximum setting : ($10 I_r$) ; Minimum setting : ($2 I_r$)

Circuit breaker with electronic overcurrent protection, having an adjustable current rating by electronic means only (i.e. without change of current sensors)


(A.K. Rastogi)
TEST ENGINEER
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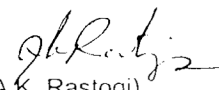
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Certificate Number: 2003/STN-1/339

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SUMMARY OF TESTS CONDUCTED

- 1.0 Test (s) conducted : Combined test sequence consisting of the following tests:
(i) Verification of overload release.
(ii) Rated short time withstand current.
(iii) Rated service short circuit breaking capacity.
(iv) Verification of operational capability.
(v) Verification of dielectric withstand.
(vi) Verification of temperature rise.
(vii) Verification of overload release.
- 2.0 Rating for which tested : For test No. 1 : at 2 times the value of current setting on each pole separately.
For test No. 2 : 76kArms for 1.0 second with an initial peak of 167.2kA.
For test No. 3 : 76kArms at 415V AC, 0.2 p.f.
For test No. 4 : 5000Amps 415V AC for 25 'CO' operations
For test No. 5 : as specified in the standard.
For test No. 6 : 5000A (AC)
For test No. 7 : - at 1.45 times the value of current setting
- at 2.5 times the value of current setting on each pole separately.
- 3.0 Schedule of test results : As per sheet nos. 5 to 14
- 4.0 Oscillogram number (s) : 031218-12,13,15,16,17,19,20,21,22
S2030800.S01 to S08
- 5.0 Test circuit diagram number (s) : STN-1/TCD/STC.1 & OLTS/TCD-LVSC-02


(A.K. Rastogi)
TEST ENGINEER