

Test Document

Report No.: 03-034-MS/E

Copy No.: 0

Contents: 20 sheets

Equipment under test: Three-pole vacuum circuit-breaker 3AH5273-6 (24 kV, 25 kA, 2500 A) with vacuum interrupters VS 25005L.

Manufacturer: Siemens AG, PTD M C PB1, 13623 Berlin

Client: Siemens AG, PTD M C R&D VCB 13, 13623 Berlin

Testing station: Siemens AG, Prüffeld der Schaltwerke, Berlin

Date of test: April 29-2003

Applied test specifications:

IEC Publication 60694, edition 2.2, 2002-01

DIN EN 60694 (VDE 0670, Teil 1000), 2002-09

IEC Publication 62271-100, 1st edition, 2001-05

Tests performed: Short-time and peak withstand current tests:

Peak current: 66.0 kA

Short-time current: 25.9 kA - 3 s

Test results: The apparatus tested has passed the above indicated tests for a rated short-circuit current of 25 kA without any objection. The results obtained and the proved performance comply with the requirements mentioned above.

Siemens Aktiengesellschaft
Prüffeld der Schaltwerke, Berlin

i.v. Anger
Anger

Manager of Prüffeld der Schaltwerke

Medium Voltage Division



i.v. Jäger
Jäger

Manager of High-Power/High Voltage
Testing Department
Medium Voltage Division

Berlin, May 31-2003

The test results exclusively
relate to the items tested.



DAT-P-017/92-02

Technical Data of Test Object

Switching Device

Ratings assigned by the manufacturer

Test object: Three-pole vacuum circuit-breaker with vacuum interrupters VS 25005L
Type: 3AH5273-2
Manufacturer: Siemens AG, PTD M C PB1
Serial No.: 3AH5/00011632 **Year of manufacture:** 2003
Drawing No.: Drawings and part lists - see sheet 6

Rated voltage	24	kV
Rated lightning impulse withstand voltage	125	kV
Rated switching impulse withstand voltage	-	kV
Rated short-duration power-frequency withstand voltage	50	kV
Rated frequency	50	Hz
Rated normal current	2500	A
Rated peak withstand current	63	kA
Rated short-time withstand current	25	kA
Rated duration of short-circuit	3	s
Rated short-circuit breaking current		
Rated short-circuit current	25	kA
D.C. component	36	%
Rated short-circuit making current	63	kA
Rated transient recovery voltage		
Peak value	41	kV
Rate of rise	0.47	kV/μs
First-pole-to-clear-factor	1.5	
Rated operating sequence	O-0.3s-CO-3min-CO	
Arc extinguishing medium	vacuum	
Rated pressure (20 °C) (absolute)	< 0.01	Pa
Insulating medium	air	
Rated pressure / Minimum pressure (20 °C)	-	MPa
Driving mechanism		
Type of drive	spring/motor	
Rated voltage	110	V DC
Number of poles	3	
Number of units per pole	1	
Rated opening time	< 65	ms
Rated closing time	< 75	ms
Rated voltage of opening release	110	V DC
Rated voltage of closing release	110	V DC
Rated supply voltage	-	V DC
Rated frequency of supply voltage	-	Hz
Further specifications:		
Tube in pole R	S.-No.:	39500
Tube in pole S	S.-No.:	39504
Tube in pole T	S.-No.:	39508

Essential characteristics: -

Remarks: -

Test Report

Report No.: 04-013-MS/E

Copy No.: 0

Contents: 59 sheets

Equipment under test: Three-pole vacuum circuit-breaker 3AH5274-2 (24 kV, 25 kA, 1250 A) with vacuum interrupters VS 25005.

Manufacturer: Siemens AG, PTD M C PB1, 13623 Berlin

Client: Siemens AG, PTD M C R&D 1, 13623 Berlin

Testing station: Siemens AG, Prüffeld der Schaltwerke, Berlin

Date of test: March 23 till April 15, 2004

Applied test specifications:

IEC Publication 60694, edition 2.2, 2002-01

DIN EN 60694 (VDE 0670, Teil 1000), 2002-09

IEC Publication 62271-100, 1st edition, 2001-05

DIN EN 62271-100 (VDE 0671 Teil 100) 2004-04

Tests performed: Short-circuit tests in test-duties:
T100s and T100a
Single-phase and double-earth fault tests.

Test results: The apparatus tested has passed the above indicated tests for a rated current of 25 kA at a rated voltage of 24 kV without any objection. The results obtained and the proved performance comply with the requirements mentioned above.

Siemens Aktiengesellschaft
Prüffeld der Schaltwerke, Berlin

i.v. Jäger
Jäger

Manager of Prüffeld der Schaltwerke

Medium Voltage Division



i.v. Rädisch

Rädisch

Manager of High-Power/High Voltage Testing
Department
Medium Voltage Division

Berlin, June 23, 2004

The test results exclusively
relate to the items tested.



DAT-P-017/92

Technical Data of Test Object

Switching Device

Ratings assigned by the manufacturer

Test object: Three-pole vacuum circuit-breaker
Type: 3AH5274-2 with vacuum interrupters VS 25005
Manufacturer: Siemens AG, PTD M C PB 1
Serial No.: 3AH52/00000236 **Year of manufacture:** 2003
Drawing No.: Drawings and part lists - see sheet 6

Rated voltage	24 kV
Rated lightning impulse withstand voltage	125 kV
Rated switching impulse withstand voltage	- kV
Rated short-duration power-frequency withstand voltage	50 kV
Rated frequency	50/60 Hz
Rated normal current	1250 A
Rated peak withstand current	63/65 kA
Rated short-time withstand current	25 kA
Rated duration of short-circuit	3 s
Rated short-circuit breaking current	
Rated short-circuit current	25 kA
D.C. component	36 %
Rated short-circuit making current	63/65 kA
Rated transient recovery voltage	
Peak value	41 kV
Rate of rise	0.47 kV/ μ s
First-pole-to-clear-factor	1.5
Rated operating sequence	O-0.3s-CO-3min-CO
Arc extinguishing medium	vacuum
Rated pressure (20 °C) (absolute)	< 0.01 Pa
Insulating medium	air
Rated pressure / Minimum pressure (20 °C)	- MPa
Driving mechanism	
Type of drive	spring/motor
Rated voltage	110 V DC
Number of poles	3
Number of units per pole	1
Rated opening time (1 st / 2 nd release)	< 65 / < 50 ms
Rated closing time	< 75 ms
Rated voltage of opening release	110 V DC
Rated voltage of closing release	110 V DC
Rated supply voltage	- V DC
Rated frequency of supply voltage	- Hz
Further specifications:	
Tube in pole R	S.-No.: 060530
Tube in pole S	S.-No.: 060531
Tube in pole T	S.-No.: 060529

Essential characteristics: -

Remarks: -

Type Test Certificate of Switching Performance

No.**L09064**

Duly signed copy 0E

Reference: 111-09/210-379

Apparatus: Medium Voltage vacuum circuit-breaker
 Type: 3AH5274-2 Rated peak withstand current: 63 kA
 Rated voltage: 24 kV Rated short-time withstand current: 25 kA
 Rated normal current: 800 A Rated duration of short-circuit: 3 s
 Rated frequency: 50 Hz

Manufacturer: SIEMENS AG, E D MV C I MF 1
 Nonnendammallee 104, 13629 Berlin
 Germany

Customer: SIEMENS AG, E D MV C I PM B 2
 Nonnendammallee 104, 13629 Berlin
 Germany

Place and Date of Tests: FGH Mannheim • Germany, 18th August to 1st September 2009

Test Specification: IEC 62271-100, Ed. 2.0, 2008-04
 IEC 62271-1, Ed. 1.0, 2007-10

Test Performed: Standard Test duty T60 as a preconditioning test
 Capacitive current switching tests:
 - Cable charging current switching tests, for class C2
 - Back to back capacitor bank current switching tests, for class C2
 - Short-time power-frequency withstand voltage test as condition check
 - Temperature rise test after capacitive current switching test.

Test Results: During the capacitive switching tests the circuit breaker shows no signs of excessive distress. External or phase-to-ground flashover did not occur. No resumption of power frequency current appears. After the tests the mechanical functions and the insulation of the circuit breaker is essentially in the same condition as before the tests. The value of the resistance of the main circuit after the tests has increased by max. 38.5%. The value of the resistance across the vacuum interrupters after the tests has increased by max. 190%. When the circuit-breaker is operated with the rated current of 800 A the limited temperature rise according the applied test specification is not exceeded.

The above mentioned test object has passed the tests performed in accordance with the applied test specifications



Jürgen Faber
FGH Engineering & Test GmbH



Dr. Stephan Finke
Test Engineer

Mannheim, 21 September 2009

Number of sheets: 129

Revision: 11 November 2009

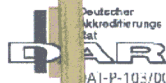
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FGH Engineering & Test GmbH is a laboratory of the



Independent test laboratory accredited acc. to DIN EN ISO/IEC 17025 by Deutsche Akkreditierungsstelle Technik (DA Tech) e.V. in the fields of high-voltage equipment and components, power cables and their accessories, electromagnetic compatibility (EMC) - quality of voltage and flicker.

Member Laboratory of the Short-Circuit Testing Liaison (STL)



Test documents issued by the FGH Engineering & Test GmbH

A Type Test Certificate

is issued for complete type tests according to valid standards taking into account valid STL guides.

Equipment to be tested must be clearly identifiable:

- Apparatus by a nameplate according to the relevant standard and by suitable drawings;
- Equipment for which the relevant standard does not require a nameplate, by suitable drawings and descriptions where necessary. In certain cases, a specification of details may be required.

The Type Test Certificate confirms that during all tests of the equipment according to the standard the specified pass criteria for its behaviour during the tests and its conditions after the tests have been fully met.

A Test Certificate

is issued for equipment having passed parts of the type tests specified in the relevant standards or fulfilling accepted specifications or recommendations.

Equipment to be tested must be clearly identifiable:

- Apparatus by a nameplate according to the relevant standard and by suitable drawings;
- Equipment for which the relevant standard does not require a nameplate, by suitable drawings and descriptions where necessary. In certain cases, a specification of details may be required.

The Test Certificate confirms that during the test of the equipment according to the standard the specified pass criteria for its behaviour during the tests and its conditions after the tests have been fully met.

A Test Report

is issued for all tests which do not meet the requirements of a Type Test Certificate or a Test certificate and have been performed according to specifications, standards and/or clients' instructions. Similarly, this test report contains all test results, details of the conditions under which the tests were performed, also details relating to the behaviour of the test object, and its condition after the tests.

An Investigation Report

is issued for investigations which have not the character of proving tests.

A Test Confirmation

is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Photographs and identification documents

Inserted photographs and identification documents (e. g. drawings, parts lists) must bear the FGH-stamp.

In case of electronic photographs the stamp can be omitted.

The customer confirmed by his signature that the test object corresponds to the submitted identification documents. FGH checked the accordance for essential details.

The original identification documents were stamped and signed by FGH. If this document contains electronic identification documents without FGH-stamp, the conformance with the checked, stamped and signed original documents has been verified by FGH.

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- If a client refers to the accreditation of the FGH Engineering & Test GmbH, the reference shall include the accreditation body DATech, the relevant scope of the accreditation and the appropriate registration number.
- The test results included in the test documents as well as their evaluation relate exclusively to items tested.
- The test documents may not be reproduced, except in full contents, without written approval by the FGH Engineering & Test GmbH.

2 Technical data of apparatus

Apparatus:	Medium Voltage vacuum circuit-breaker		
Type:	3AH5274-2		
Manufacturer:	SIEMENS AG, E D MV C I MF 1		
Serial No.	3AH52/00009518		
Type of Vacuum bottle	VS 25005		
Serial-no's [L1, L2, L3]	L1: 095727, L2: 095719, L3 095717		
Mechanism of circuit-breaker	Motor drive		
Year of manufacture:	2009		
Rated voltage:	24 kV	Rated peak withstand current:	63 kA
Rated normal current:	800 A	Rated short-time withstand current:	25 kA
Rated frequency:	50 Hz	Rated duration of short-circuit:	3 s
Rated cable charging current	31,5 A	Rated back to back capacitor bank breaking current	400 A