

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12022Fr-1

Copy No.: 0

Contents: 22 Sheets

Test object: Metal-enclosed switchgear type SIMOSEC, air insulated, extendable

Designation: Arrangement of cable panels type K and billing metering panel type M(-B)

Rated voltage:	17,5 kV	Rated normal current:	630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	4 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Client: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 30 January 2012

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.2	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.2
IEC 62271-1: 2007-10, clause 6.2	DIN EN 62271-1 (VDE 0671 Teil 1): 2009-08, Abschnitt 6.2

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Short-time withstand current and peak withstand current tests" at 50 Hz:

1. Test on main circuit
2. Test on earthing circuit

(continued on sheet 3)

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 21 February 2012

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Deutsche Akkreditierungsstelle
D-PL-12072-01-01

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the Deutsche Akkreditierungsstelle GmbH (DAkkS) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. D-PL-12072-01-01).

STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the framework of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

A Type Test Certificate

is issued for type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of the test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Document

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A Test Report

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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.

Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office: PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Germany
Internet: www.pehla.com

Testing Station: PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.
manufactured at: 12, Hanjiang Road
214028 Wuxi
China

Client: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.
12, Hanjiang Road
214028 Wuxi
China

Tests Performed

(Continuation from sheet 1)

1. Test on main circuit

Test 12022Fr / 03:

Three-phase short-time withstand current and peak withstand current test of the main circuit from the feeder connections of the right standing cable panel typ K, over the billing metering panel type M(-B) to the short circuit on the feeder connections of the left standing cable panel type K with a peak withstand current of 57,3 kA, a short-time withstand current of 22,6 kA and a duration of 4,02 s (corresponding to 21,0 kA / 4,65 s).

2. Test on earthing circuit

Test 12022Fr / 08:

Single-phase short-time withstand current and peak withstand current test of the earthing circuit from earthing connection "M12" of the left standing cable panel type K over the billing metering panel type M(-B) to the earthing connection "M12" of the right standing cable panel type K with a peak withstand current according client's instructions of 65,7 kA, a short-time withstand current of 25,8 kA and a duration of 1,00 s (corresponding to 25,0 kA / 1,07 s).

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12074Fr

Copy No.: 0

Contents: 13 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable

Designation: Ring-main panel type R

Rated voltage:	24 kV	Rated normal current:	630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Tested for: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 15 May 2012

Applied test specifications:

IEC 62271-200: 2011-10, clause 6

IEC 62271-102: 2003-08, clause 6.105

DIN EN 62271-102 (VDE 0671, Teil 102) 2003-10, Abschnitt 6.105

IEC 62271-103: 2011-06, clause 6.102.6

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

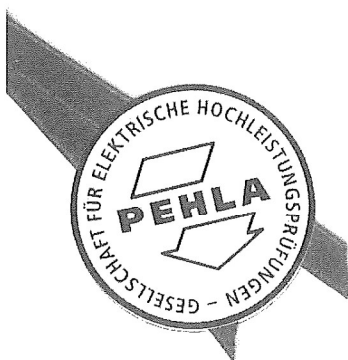
Tests performed:

Type test „Tests to verify the proper functioning of the position indicating device“ of a three-position switch-disconnector:

- Test on the power kinematic chain of the disconnector function.
- Test on the power kinematic chain of the earthing function.

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 16 May 2013

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Notes

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Uncertainty of the measurement systems

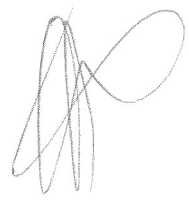
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Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com	Client:	Siemens Aktiengesellschaft, Berlin and Munich
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany	Letters to: Siemens AG Infrastructure & Cities Sector Low and Medium Voltage Division Medium Voltage & Systems Mozartstr. 31c 91052 Erlangen Germany as shareholder and contractor of PEHLA GbR	
Manufacturer:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.	Tested for:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd. 12, Hanjiang Road 214028 Wuxi China
manufactured at:	12, Hanjiang Road 214028 Wuxi China		

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)



Test Document

Report No.: 12004Fr

Copy No.: 0

Contents: 17 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable

Designation: Arrangement of transformer feeder panel type T and ring-main panel type R

Rated voltage: 17,5 kV Rated normal current - / 1) Rated frequency: 50 Hz / 60 Hz
 T/R: 630 A

Rated peak withstand current: 50 kA / 2) Rated short-time withstand current: 20 kA Rated duration of short-circuit: 1 s 2)

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse-link.
 2) Prospective values for transformer feeder, limited by the type of the HV HRC fuse-link.

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Client: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 24 January 2012

Applied test specifications:

- IEC 62271-1: 2007-10, clause 6.7 DIN EN 62271-1 (VDE 0671 Teil 1): 2009-08, Abschnitt 6.7
- IEC 62271-200: 2011-10, clause 6.7
- IEC 60529: 2001-02 DIN EN 60529 (VDE 0470 Teil 1): 2000-09
- IEC 60262: 2002-02 DIN EN 50102 (VDE 0470 Teil 100): 1997-09

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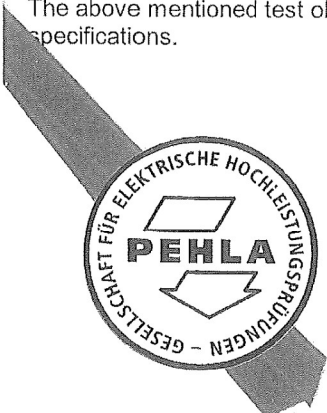
Tests performed:

Type test "Verification of the protection"

- Verification of the IP coding IP 3X of the enclosure
- Verification of the IK coding IK 07 of the enclosure

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE
HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 17 February 2012

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Deutsche
Akkreditierungsstelle
D-PL-12072-01-01



Notes

Accreditation

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STL-Member

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PEHLA-Documents

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Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
manufactured at:	12, Hanjiang Road 214028 Wuxi China
Client:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd. 12, Hanjiang Road 214028 Wuxi China

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12029Fr-1

Copy No.: 0

Contents: 22 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable

Designation: Corepart and cable connection compartment of ring-main feeder panel type R

Rated voltage:	24 kV	Rated normal current:	800 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	50 kA / 52,5 kA	Rated short-time withstand current:	20 kA	Rated duration of short-circuit:	4 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Client: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 12 March 2012

Applied test specifications:
IEC 62271-200: 2011-10, clauses 6.2
IEC 62271-1: 2011-08, clauses 6.2

and according client's instructions

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Dielectric tests" on the switching device compartment (corepart) and cable connection compartment of the ring-main panel type R:

1. Power frequency voltage test 50 Hz, 1 min
2. Lightning impulse voltage test 1,2 / 50 µs

(continued on sheet 3)

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 08 October 2012

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STL-Member

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Addresses

Office: PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Germany
Internet: www.pehla.com

Testing Station: PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.
manufactured at: 12, Hanjiang Road
214028 Wuxi
China

Client: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.
12, Hanjiang Road
214028 Wuxi
China

Tests Performed and Test Results

(continuation from sheet 1)

1. Power frequency voltage test 50 Hz, 1 min
 - phase to earth with 50 kV
 - across the contact gaps with 50 kV
 - across the isolating distance with 60 kV

and according client's instructions

- phase to earth with 55 kV
- across the contact gaps with 55 kV
- across the isolating distance with 63 kV

2. Lightning impulse voltage test 1.2 / 50 μ s
 - phase to earth with ± 125 kV
 - across the contact gaps with ± 125 kV
 - across the isolating distance with ± 145 kV

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12014Fr-1

Copy No.: 0

Contents: 19 Sheets

Test object: Metal-enclosed, air-insulated and extendable switchgear type SIMOSEC
Designation: Transformer feeder panel type T with tubular bridging links type 3GX5 501
(e = 442 mm)
Rated voltage: 17,5 kV Rated normal current: 200 A Rated frequency: 60 Hz
Rated peak withstand current: 26 kA Rated short-time withstand current: 10 kA Rated duration of short-circuit: 1 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
Client: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
Testing station: PEHLA-Testing Laboratory Frankfurt am Main
Date of test: 2 to 22 February 2012

Applied test specifications:

IEC 62271-200: 2011-10, clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 6.5.6
IEC 62271-1: 2007-10, clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6	DIN EN 62271-1 (VDE 0671 Teil 1): 2009-08, Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 6.5.6
IEC 62271-105: 2002-08, clauses 6.4 and 6.5	DIN EN 62271-105 (VDE 0671 Teil 105): 2003-12, Abschnitte 6.4 und 6.5

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

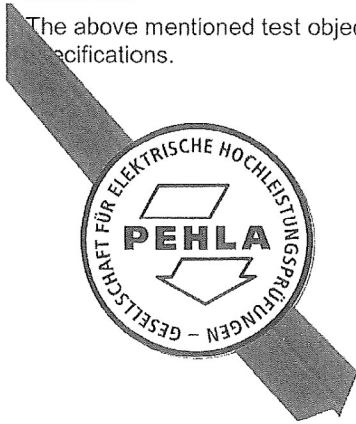
Tests performed:

Type test "Temperature rise"

1. Measurement of the resistance of the main circuit before temperature-rise test
2. Temperature-rise test at the rated normal current of 200 A / 60 Hz
3. Measurement of the resistance of the main circuit after temperature-rise test

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 05 April 2012

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Deutsche
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D-PL-12072-01-01

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Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
manufactured at:	12, Hanjiang Road 214028 Wuxi China
Client:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd. 12, Hanjiang Road 214028 Wuxi China

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12013Fr

Copy No.: 0

Contents: 11 Sheets

Test object: Metal-enclosed switchgear, air insulated, extendable

Designation: SIMOSEC, gas-filled compartment of transformer feeder panel type T

Rated voltage:	24 kV	Rated normal current: - A	1) Rated frequency:	50/60 Hz
Rated peak	52,5 kA /	Rated short-time	Rated duration of	
withstand current:	54,6 kA	withstand current:	21 kA	2) short-circuit: 3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse-link.
2) Prospective values, limited by the type of the HV HRC fuse-link.

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Tested for: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 12 April 2012

Applied test specifications:

IEC 62271-200: 2011-10, clause 6.103

DIN EN 62271-200 (VDE 0671, Teil 200): 2004-10, Abschnitt 6.103

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Pressure withstand tests for gas-filled compartments"

Pressure withstand test for gas-filled compartments with pressure relief devices:

- Pressure withstand test with 1,3 times the design pressure of the compartment for a period of 1 min.
- Pressure withstand test with 3 times the design pressure of the compartment.
- Verification of the opening pressure of the relief device.

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 13 June 2013

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Deutsche Akkreditierungsstelle
D-PL-12072-01-01

Notes

Accreditation

The PEHLA GbR, PEHLA-Testing Laboratory Frankfurt am Main has been approved by the Deutsche Akkreditierungsstelle GmbH (DAkkS) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. D-PL-12072-01-01).

STL-Member

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PEHLA-Documents

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Uncertainty of the measurement systems

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Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com	Client:	Siemens Aktiengesellschaft, Berlin and Munich
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany	Letters to: Siemens AG Infrastructure & Cities Sector Low and Medium Voltage Division Medium Voltage & Systems Mozartstr. 31c 91052 Erlangen Germany as shareholder and contractor of PEHLA GbR	
Manufacturer:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.	Tested for:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd. 12, Hanjiang Road 214028 Wuxi China
manufactured at:	12, Hanjiang Road 214028 Wuxi China		

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manufactured at:	12, Hanjiang Road 214028 Wuxi China
Client:	Siemens AG Infrastructure & Cities Sector Low and Medium Voltage Division Medium Voltage & Systems Mozartstr. 31c 91052 Erlangen Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12194Fr-2

Copy No.: 0

Contents: 27 Sheets

Test object: Metal-enclosed switchgear, air insulated, extendable
Designation: SIMOSEC, ring-main panel type R1 with CT, arranged with circuit-breaker panel type L1(AR)
 Rated voltage: 24 kV Rated normal current: 630 A Rated frequency: 50 Hz / 60 Hz
 Rated peak withstand current: 50 kA / 52 kA Rated short-time withstand current: 20 kA Rated duration of short-circuit: 4 s
Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
Client: SIEMENS AG
Testing station: PEHLA-Testing Laboratory Frankfurt am Main
Date of test: 14 November 2012

Applied test specifications:

IEC 62271-200: 2011-10, clause 6.6

DIN EN 62271-200 (VDE 0671 Teil 200): 2012-08, Abschnitt 6.6

IEC 62271-1: 2011-08, clause 6.6

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Short-time withstand current and peak withstand current tests" at 50 Hz:

1. Test on main circuit
2. Tests on earthing circuit

(continued on sheet 3)

Test results:

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



Mannheim, 14 May 2013

GESELLSCHAFT FÜR ELEKTRISCHE
HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

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Deutsche
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D-PL-12072-01-01

Notes

Accreditation

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Addresses

Office: PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Germany
Internet: www.pehla.com

Testing Station: PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.
manufactured at: 12, Hanjiang Road
214028 Wuxi
China

Client: Siemens Aktiengesellschaft, Berlin and Munich
Letters to:
Siemens AG
Infrastructure & Cities Sector
Low and Medium Voltage Division
Medium Voltage & Systems
Mozartstr. 31c
91052 Erlangen
Germany

Tests Performed

(Continuation from sheet 1)

1. Test on main circuit

Test 12194Fr / 08:

Three-phase short-time withstand current and peak withstand current test of the main circuit from the feeder connections of the ring-main panel type R1 to the short circuit on the busbar bushings of the adjacent left standing circuit-breaker panel type L1(AR) with a peak withstand current of 52,0 kA, a short-time withstand current of 20,4 kA and a duration of 4,02 s (corresponding to 20,0 kA / 4,17 s).

2. Tests on earthing circuit

Test 12194Fr / 07:

Single-phase short-time withstand current and peak withstand current test of the earthing circuit from the feeder bushing in phase L3 of the ring-main panel type R1 over the three-position switch-disconnector in EARTHED-position to the earthing point M12 of the left standing circuit-breaker panel type L1(AR) with a peak withstand current of 57,7 kA, a short-time withstand current of 23,7 kA and a duration of 1,00 s (corresponding to 21,8 kA = 25,0 kA x 0,87 - 1,19 s).

Test 12194Fr / 09:

Three-phase short-time withstand current and peak withstand current test of the earthing circuit from the feeder bushings of the ring-main panel type R1 over the three-position switch-disconnector in EARTHED-position with a peak withstand current of 51,4 kA, a short-time withstand current of 20,3 kA and a duration of 4,01 s (corresponding to 20,0 kA / 4,14 s).

Test 12194Fr / 10:

Three-phase peak withstand current test of the earthing circuit from the feeder bushings of the ring-main panel type R1 over the three-position switch-disconnector in EARTHED-position with a peak withstand current of 52,1 kA, a short-time withstand current of 20,5 kA and a duration of 0,31 s (corresponding to 20,0 kA / 0,33 s).

Remark:

As the peak withstand current of test no. 12194Fr / 09 was fallen below the tolerance given in the applied test specifications, an additional peak withstand current test 12194Fr / 10 was made with the duration not less than 0,3 s.

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Report

Report No.: 12103Fr Copy No.: 0 Contents: 23 Sheets

Test object: Metal-enclosed switchgear type SIMOSEC, air insulated, extendable

Designation: Ring-main panel type R

Rated voltage:	17,5 kV	Rated normal current:	630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Client: SIEMENS AG

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 15 August 2012

Applied test specifications:
IEC 62271-200 Ed.2.0: 2011-10, clause 6.106
and according client's instruction

Tests performed:
Type Test "Internal arcing test" of the cable connection compartment

Testing under conditions of arcing due to an internal fault according classification IAC AFLR 21 kA 1s. Three-phase arc initiation within the cable connection compartment with a peak current of 52,7 kA and a short-circuit current of 21,5 kA – 1,00 s ($I_A = 21,0 \text{ kA} - 1,03 \text{ s}$ accordingly), tested according client's instructions with a ceiling height 300 mm above upper part of the test specimen (2400 mm from the floor accordingly).

(continued on sheet 3)

Test results:
The above mentioned test object has passed the tests performed in accordance with the applied test specifications.



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 08 April 2013

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Notes

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Addresses

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Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
manufactured at:	12, Hanjiang Road 214028 Wuxi China
Client:	Siemens AG Infrastructure & Cities Sector Low and Medium Voltage Division Medium Voltage Mozartstr. 31c 91052 Erlangen Germany

Tests performed

(continuation from sheet 1)

The test on the switchgear was performed for accessibility type A (restricted to authorized personal only).

The test of the free-standing panel took place in a room mock-up with an effective ceiling height of 2400 mm. The distance between the rear wall of the switchgear and the wall of the room mock-up was 800 mm, between the top of the switchgear and the ceiling of the room mock-up was 300 mm and between the right lateral wall and the room mock-up was 100 mm.

Vertical indicators were arranged at three sides of the switchgear (front, rear and left lateral) at a distance of 300 mm and covering 40% to 50% of the area.

Horizontal indicators were attached at a height of 2000 mm above the ground and at a distance of 300 mm to 800 mm from the switchgear.

The three-phase infeeding of the current was in the cable connection compartment of the right-standing ring-main panel R via cables 240 mm².

The three-phase arc initiation was within the cable connection compartment of left-standing ring-main panel R.

Test Results

(continuation from sheet 1)

Test no. 12103Fr / 03

Criteria according to IEC 62271-200 Ed. 2		fulfilled (yes/no)
No. 1:	Correctly secured doors and covers do not open	yes
No. 2:	No fragmentation of the enclosure occurs and no parts more than 60 g flow away	yes
No. 3:	Arcing does not cause holes in the accessible sides up to a height of 2 m	yes
No. 4:	Indicators do not ignite due to the effect of hot gases	yes
No. 5:	The enclosure remains connected to its earthing point	yes

Test result: The requirements for the verification of the internal arc classification IAC A FLR 21 kA 1s for a ceiling height ≥ 300 mm are met for the compartment tested.

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12097Fr-8

Copy No.: 0

Contents: 18 Sheets

Test object: Metal-enclosed switchgear type SIMOSEC, air insulated, extendable; arrangement consisting of transformer panel type T, circuit-breaker panel type L(NAR) and ring-main panel type R with bushing type CT

Designation: Ring-main panel type R with bushing type CT and partially tin-coated cable terminal
Rated voltage: 24 kV Rated normal current: 630 A Rated frequency: 50 Hz
Rated peak withstand current: 52,5 kA Rated short-time withstand current: 21 kA Rated duration of short-circuit: 3 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Tested for: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 09 to 15 October 2012

Applied test specifications:

IEC 62271-200: 2011-10, clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6

DIN EN 62271-200 (VDE 0671 Teil 200): 2012-08, Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 6.5.6

IEC 62271-1: 2011-08, clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Temperature rise":

1. Measurement of the resistance of the main circuit before temperature-rise test
2. Temperature-rise test at the rated normal current of 630 A / 50 Hz
3. Measurement of the resistance of the main circuit after temperature-rise test

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 24 April 2013

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Deutsche Akkreditierungsstelle
D-PL-12072-01-01

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Manufacturer:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.	Tested for:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd. 12, Hanjiang Road 214028 Wuxi China
manufactured at:	12, Hanjiang Road 214028 Wuxi China		

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12166Fr-1

Copy No.: 0

Contents: 15 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable

Designation: Busbar compartment of an arrangement of three ring-main panels type R, including internal arc proof end-panel

Rated voltage: 24 kV	Rated normal current: 630 A	Rated frequency: 50 Hz / 60 Hz
Rated peak withstand current: 52,5 kA	Rated short-time withstand current: 21 kA	Rated duration of short-circuit: 3 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Client: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 10 October 2012

Applied test specifications:

IEC 62271-200: 2011-10, clause 6.2 DIN EN 62271-200 (VDE 0671 Teil 200): 2012-08, Abschnitt 6.2

IEC 62271-1: 2011-08, clause 6.2

and according client's instructions und nach Angaben des Auftraggebers

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

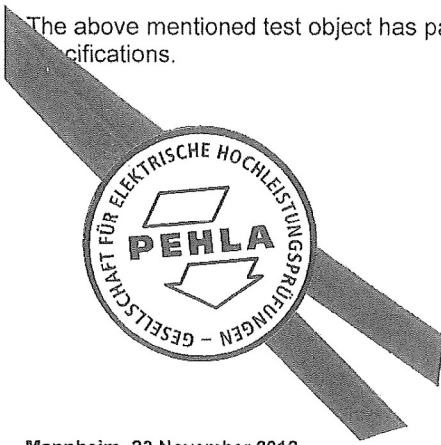
Tests performed:

Type test "Dielectric tests" on the busbar compartment of an arrangement of three ring-main panels:

1. Power frequency voltage test 50 Hz, 1 min
with increased values according client's instructions
- phase-to-earth and between phases with 55 kV
2. Lightning impulse voltage test 1.2 / 50 μ s
- phase-to-earth and between phases with ± 125 kV

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 23 November 2012

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D-PL-12072-01-01

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Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
manufactured at:	12, Hanjiang Road 214028 Wuxi China
Client:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd. 12, Hanjiang Road 214028 Wuxi China

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12182Fr-2 Copy No.: 0 Contents: 14 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable

Designation: Ring-main transfer panel type R(T) and bus-riser pane type H with CT

Rated voltage:	24 kV	Rated normal current:	630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Tested for: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 07 November 2012

Applied test specifications:

IEC 62271-200: 2011-10, clause 6.2 DIN EN 62271-200 (VDE 0671 Teil 200): 2012-08, Abschnitt 6.2

IEC 62271-1: 2011-08, clause 6.2

and according client's instructions und nach Angaben des Auftraggebers

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Dielectric tests" on the busbar arrangement of the ring-main transfer panel type R(T) and bus-riser pane type H:

1. Power frequency voltage test 50 Hz, 1 min
with increased values according client's instructions
- phase-to-earth and between phases with 55 kV
2. Lightning impulse voltage test 1,2 / 50 μs
- phase-to-earth and between phases with ±125 kV

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 07 March 2013

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Notes

Accreditation

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STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the framework of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

A Type Test Certificate

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A Test Report

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A Test Confirmation

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Uncertainty of the measurement systems

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Addresses

Office: PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Germany
Internet: www.pehla.com

Testing Station: PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.
manufactured at: 12, Hanjiang Road
214028 Wuxi
China

Client: Siemens AG
Infrastructure & Cities Sector
Low and Medium Voltage Division
Medium Voltage & Systems
Mozartstr. 31c
91052 Erlangen
Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Report

Report No.: 12083Fr

Copy No.: 0

Contents: 26 Sheets

Test object: Metal-enclosed switchgear type SIMOSEC, air insulated, extendable; consisting of transformer panel type T and two ring-main panels type R

Designation: Transformer panel type T

Rated voltage:	17,5 kV	Rated normal current:	-	1) Rated frequency:	50 Hz / 60 Hz
Rated peak	52,5 kA /	Rated short-time		Rated duration of	
withstand current:	54,6 kA	2) withstand current:	21 kA	2) short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse-link.
2) Prospective values for transformer feeder, limited by the type of the HV HRC fuse-link.

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Client: SIEMENS AG

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 21 August 2012

Applied test specifications:

IEC 62271-200 Ed.2.0: 2011-10, clause 6.106

and according client's instruction

Tests performed:

Type Test "Internal arcing test" of the cable connection compartment

Testing under conditions of arcing due to an internal fault according classification IAC AFLR 21 kA 1s. Three-phase arc initiation within the cable connection compartment with a peak current of 54,2 kA and a short-circuit current of 21,6 kA – 1,02 s ($I_A = 21,0 \text{ kA} - 1,05 \text{ s}$ accordingly), tested according client's instructions with a ceiling height 300 mm above upper part of the test specimen (2400 mm from the floor accordingly).

(continued on sheet 3)

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE
HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 05 April 2013

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Deutsche
Akkreditierungsstelle
D-PL-12072-01-01

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the Deutsche Akkreditierungsstelle GmbH (DAkKS) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. D-PL-12072-01-01).

STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the framework of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

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Uncertainty of the measurement systems

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Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
manufactured at:	12, Hanjiang Road 214028 Wuxi China
Client:	Siemens AG Infrastructure & Cities Sector Low and Medium Voltage Division Medium Voltage Mozartstr. 31c 91052 Erlangen Germany

Tests performed

(continuation from sheet 1)

The test on the switchgear was performed for accessibility type A (restricted to authorized personal only).

The test of the free-standing panel took place in a room mock-up with an effective ceiling height of 2400 mm. The distance between the rear wall of the switchgear and the wall of the room mock-up was 800 mm, between the top of the switchgear and the ceiling of the room mock-up was 300 mm and between the right lateral wall and the room mock-up was 100 mm.

Vertical indicators were arranged at three sides of the switchgear (front, rear and left lateral) at a distance of 300 mm and covering 40% to 50% of the area.

Horizontal indicators were attached at a height of 2000 mm above the ground and at a distance of 300 mm to 800 mm from the switchgear.

The three-phase infeeding of the current was in the cable connection compartment of the right-standing ring-main panel R via cables 240 mm².

The three-phase arc initiation was above the installed HV HRC fuses within the cable connection compartment of left-standing transformer panel T.

Test Results

(continuation from sheet 1)

Test no. 12083Fr / 03

Criteria according to IEC 62271-200 Ed. 2		fulfilled (yes/no)
No. 1:	Correctly secured doors and covers do not open	yes
No. 2:	No fragmentation of the enclosure occurs and no parts more than 60 g flow away	yes
No. 3:	Arcing does not cause holes in the accessible sides up to a height of 2 m	yes
No. 4:	Indicators do not ignite due to the effect of hot gases	yes
No. 5:	The enclosure remains connected to its earthing point	yes

Test result: The requirements for the verification of the internal arc classification IAC A FLR 21 kA 1s for a ceiling height \geq 300 mm are met for the compartment tested.

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Report

Report No.: 12075Fr

Copy No.: 0

Contents: 13 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable

Designation: Transformer-feeder panel type T

Rated voltage:	24 kV	Rated normal current:	-	1) Rated frequency:	50 Hz / 60 Hz
Rated peak	52,5 kA /	Rated short-time		Rated duration of	
withstand current:	54,6 kA	2) withstand current:	21 kA	2) short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse-link.
2) Prospective values, limited by the type of the HV HRC fuse-link.

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Tested for: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 23 May 2012

Applied test specifications:

IEC 62271-200: 2011-10, clause 6

IEC 62271-102: 2003-08, clause 6.105

DIN EN 62271-102 (VDE 0671, Teil 102) 2003-10, Abschnitt 6.105

IEC 62271-103: 2011-06, clause 6.102.6

Tests performed:

Type test „Tests to verify the proper functioning of the position indicating device“ of a three-position switch-disconnector:

- Test on the power kinematic chain of the disconnector function.
- Test on the power kinematic chain of the earthing function.

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 16 May 2013

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Notes

Accreditation

The PEHLA GbR, PEHLA-Testing Laboratory Frankfurt am Main has been approved by the Deutsche Akkreditierungsstelle GmbH (DAkkS) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. D-PL-12072-01-01).

STL-Member

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PEHLA-Documents

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Uncertainty of the measurement systems

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Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com	Client:	Siemens Aktiengesellschaft, Berlin and Munich
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany	Letters to:	Siemens AG Infrastructure & Cities Sector Low and Medium Voltage Division Medium Voltage & Systems Mozartstr. 31c 91052 Erlangen Germany as shareholder and contractor of PEHLA GbR
Manufacturer:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.	Tested for:	SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd. 12, Hanjiang Road 214028 Wuxi China
manufactured at:	12, Hanjiang Road 214028 Wuxi China		

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 13066Fr-1 Copy No.: 0 Contents: 28 Sheets

Test object: Metal-enclosed switchgear type SIMOSEC, air insulated, extendable; transfer busbar panel arrangement

Designation: Circuit-breaker transfer panel type L(T) with ring-main transfer panel type R(T), CT+CT
 Rated voltage: 24 kV Rated normal current: 630 A Rated frequency: 50 Hz
 Rated peak withstand current: 52,5 kA Rated short-time withstand current: 21 kA Rated duration of short-circuit: 3 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
Client: SIEMENS AG
Testing station: PEHLA-Testing Laboratory Frankfurt am Main
Date of test: 22 to 24 April 2013

Applied test specifications:

IEC 62271-200: 2011-10, clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6
 IEC 62271-1: 2011-08, clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6

DIN EN 62271-200 (VDE 0671 Teil 200): 2012-08, Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 6.5.6

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Temperature rise":

1. Measurement of the resistance of the main circuit before temperature-rise test
2. Temperature-rise test at the rated normal current of 630 A / 50 Hz
3. Determination of the temperature rise of the secondary windings of the current transformers
4. Measurement of the resistance of the main circuit after temperature-rise test

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 26 April 2013

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Notes

Accreditation

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STL-Member

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PEHLA-Documents

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Uncertainty of the measurement systems

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Addresses

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68219 Mannheim
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Testing Station: PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.

manufactured at: 12, Hanjiang Road
214028 Wuxi
China

Client: Siemens AG
Infrastructure & Cities Sector
Low and Medium Voltage Division
Medium Voltage & Systems
Mozartstr. 31c
91052 Erlangen
Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 13032Fr

Copy No.: 0

Contents: 16 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable

Designation: Ring-main panel type R

Rated voltage:	24 kV	Rated normal current:	630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5kA/	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Client: SIEMENS AG

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 22 January 2013

Applied test specifications:

IEC 62271-200: 2011-10, clause 6.2

DIN EN 62271-200 (VDE 0671 Teil 200): 2012-08, Abschnitt 6.2

IEC 62271-1: 2011-08, clause 6.2

and according client's instructions und nach Angaben des Auftraggebers

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Dielectric tests on cable testing circuits":

Test of the contact gap of the three-position disconnector acc. client's instructions by performing:

1. Direct voltage ± 48 kV against power frequency voltage 24 kV test at 50 Hz - 30 min
2. Direct voltage ± 76 kV against power frequency voltage 24 kV test at 50 Hz - 15 min

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 19 March 2013

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Deutsche Akkreditierungsstelle
D-PL-12072-01-01

Notes

Accreditation

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Internet: www.pehla.com

Testing Station: PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.

manufactured at: 12, Hanjiang Road
214028 Wuxi
China

Client: Siemens AG
Infrastructure & Cities Sector
Low and Medium Voltage Division
Medium Voltage & Systems
Mozartstr. 31c
91052 Erlangen
Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 13028Fr

Copy No.: 0

Contents: 16 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable

Designation: Transformer feeder panel type T

Rated voltage:	24 kV	Rated normal current: - A	1)	Rated frequency:	50 Hz / 60 Hz
Rated peak	52,5kA/	Rated short-time		Rated duration of	
withstand current:	54,6 kA	2)	withstand current:	21 kA	2)
				short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse-link.
2) Prospective values, limited by the type of the HV HRC fuse-link.

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Tested for: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 15 January 2013

Applied test specifications:

IEC 62271-200: 2011-10, clause 6.2

DIN EN 62271-200 (VDE 0671 Teil 200): 2012-08, Abschnitt 6.2

IEC 62271-1: 2011-08, clause 6.2

and according client's instructions

und nach Angaben des Auftraggebers

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Dielectric tests on cable testing circuits":

Test of the contact gap of the three-position disconnector acc. client's instructions by performing:

1. Direct voltage ± 48 kV against power frequency voltage 24 kV test at 50 Hz - 30 min
2. Direct voltage ± 76 kV against power frequency voltage 24 kV test at 50 Hz - 15 min

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 15 March 2013

The test results relate only to the items tested.

The authenticity of this document is guaranteed by the integrity of the seal label and seal ribbon. Without a written permission of PEHLA it is not allowed to make reproduction in extracts of this document. Copying the cover sheet accompanied by sheet 2 and the sheets mentioned here is an exception.

02PE0804_fr1104



Deutsche Akkreditierungsstelle D-PL-12072-01-01

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the Deutsche Akkreditierungsstelle GmbH (DAkKS) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. D-PL-12072-01-01).

STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the framework of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

A Type Test Certificate

is issued for type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of the test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Document

is issued for parts of type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Report

is issued for all other tests which have been carried out according to specifications, standards or "PEHLA-Richtlinien" (PEHLA Guides) and/or clients' instructions. Similarly, this test report contains all test results, details of the conditions under which the tests were carried out, also details relating to the behaviour of the test object, and its condition after the 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.

Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office: PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Germany
Internet: www.pehla.com

Testing Station: PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.
manufactured at: 12, Hanjiang Road
214028 Wuxi
China

Client: Siemens AG
Infrastructure & Cities Sector
Low and Medium Voltage Division
Medium Voltage & Systems
Mozartstr. 31c
91052 Erlangen
Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 12236Fr

Copy No.: 0

Contents: 19 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable

Designation: Transformer feeder panel type T

Rated voltage: 24 kV	Rated normal current: - A	1) Rated frequency: 50 Hz / 60 Hz
Rated peak withstand current: 52,5kA/	Rated short-time withstand current: 54,6 kA	Rated duration of short-circuit: 3 s
2)	21 kA	2)

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse-link.
2) Prospective values, limited by the type of the HV HRC fuse-link.

Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.

Client: SIEMENS AG

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 09 January 2013

Applied test specifications:

IEC 62271-200: 2011-10, clause 6.2.6 DIN EN 62271-200 (VDE 0671 Teil 200): 2012-08, Abschnitt 6.2.6

IEC 62271-1: 2011-08, clause 6.2.6

and according client's instructions und nach Angaben des Auftraggebers

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

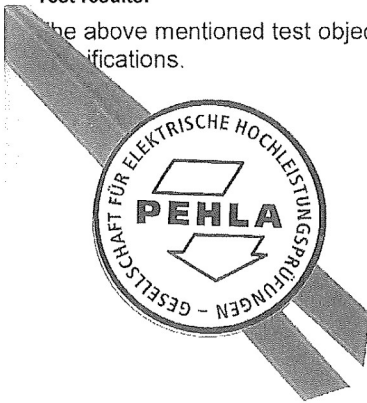
Tests performed:

Type test "Dielectric tests" on the transformer feeder panel type T:

1. Power frequency voltage test 50 Hz, 1 min
increased values according client's instructions
phase-to-earth and across the contact gaps with 55 kV and across the isolating distance with 63 kV
2. Lightning impulse voltage test 1.2 / 50 μs
phase-to-earth and across the contact gaps with ±125 kV and across the isolating distance with ±145 kV

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 06 May 2013
Rev. 01: 26 June 2013

The test results relate only to the items tested.
The authenticity of this document is guaranteed by the integrity of the seal label and seal ribbon. Without a written permission of PEHLA it is not allowed to make reproduction in extracts of this document. Copying the cover sheet accompanied by sheet 2 and the sheets mentioned here is an exception.



Notes

Accreditation

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STL-Member

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PEHLA-Documents

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is issued for type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of the test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Document

is issued for parts of type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Report

is issued for all other tests which have been carried out according to specifications, standards or "PEHLA-Richtlinien" (PEHLA Guides) and/or clients' instructions. Similarly, this test report contains all test results, details of the conditions under which the tests were carried out, also details relating to the behaviour of the test object, and its condition after the 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.

Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office: PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Germany
Internet: www.pehla.com

Testing Station: PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer: SIEMENS Medium Voltage Switching
Technologies (Wuxi) Ltd.
manufactured at: 12, Hanjiang Road
214028 Wuxi
China

Client: Siemens Aktiengesellschaft, Berlin and Munich
Letters to:
Siemens AG
Infrastructure & Cities Sector
Low and Medium Voltage Division
Medium Voltage & Systems
Mozartstr. 31c
91052 Erlangen
Germany



TIC 2107-12

TYPE TEST CERTIFICATE OF SHORT-CIRCUIT PERFORMANCE

APPARATUS A three-phase three-position SF₆-insulated switch in a metal-enclosed switchgear unit

DESIGNATION Simosec World SERIAL No. TBW 3600002919-0008, TBW 3600002919-0043

Rated voltage	24 kV (1)	Rated normal current	200 A
Rated short-circuit current	10 kA	Rated frequency	50/60 Hz

(1) See note (1) on page 5.

MANUFACTURER Siemens AG, Frankfurt am Main, Germany

TESTED FOR Siemens AG, Frankfurt am Main, Germany

TESTED BY KEMA HIGH-POWER LABORATORY
Utrechtseweg 310 - 6812 AR Arnhem - The Netherlands

DATE(S) OF TESTS 25, 26, 27 April and 21, 22 June 2012

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

IEC 62271-103 (2011) subclauses 6.6 (STC) and 6.101 (Making and breaking).
IEC 62271-102 (2012) subclause 6.6 (STC).

This Type Test Certificate has been issued by KEMA following exclusively the STL Guides.

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) and to justify the ratings assigned by the manufacturer as listed on page 5.

This Certificate applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate consists of 325 sheets in total.

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 The sealed and bound version of the Certificate is the only valid version.

KEMA Nederland B.V.
 на основании чл. 36а, ал. 3 от ЗОП

S.M. Verhoeven
 Director Testing, Inspections &
 Certification The Netherlands

Arnhem, 5 November 2012

Version: 1.0



1 Certificate

A Certificate contains a record of a series of type tests carried out strictly in accordance with a recognized standard. The equipment tested has fulfilled the requirements of this standard and the relevant ratings assigned by the manufacturer are endorsed by KEMA. The Certificate is applicable only to the equipment tested. KEMA is responsible for the validity and the contents of the Certificate.

The responsibility for conformity of any apparatus having the same designation as the one tested rests with the manufacturer. The Certificate contains the essential drawings and a description of the equipment tested.

Detailed rules are given in KEMA's Certification procedure.

2 Report of Performance

A Report of Performance contains a record of one or more tests which have been carried out according to the client's instructions. These tests are not necessarily in accordance with a recognized standard. The test results do not verify ratings of the test object.

KEMA issues three types of Reports of Performance:

2.1 The tests have been carried out strictly in accordance with The apparatus has complied with the relevant requirements.

This sentence will appear on the front page of a Report of Performance if the tests have been performed in accordance with a recognized standard, but the series of tests does not completely fulfil the requirements for a Certificate of Compliance (for example, if the number of test duties is not a complete series of type tests). The Report contains verified drawings and a description of the equipment tested. Detailed rules are given in KEMA's Certification procedure. The condition of the test object after the tests is assessed and recorded in the Report.

2.2 The tests have been carried out in accordance with the client's instructions. Test procedure and test parameters were based on

This sentence will appear on the front page of a Report of Performance if the number of tests, the test procedure and the test parameters are based on a recognized standard and related to the ratings assigned by the manufacturer. If the apparatus does not pass the tests such behaviour will be mentioned on the front sheet. Verification of the drawings (if submitted) and assessment of the condition after the tests is only done on the client's request.

2.3 The tests have been carried out according to the client's instructions.

This sentence will appear on the front page of a Report of Performance if the tests, test procedure and/or test parameters are not in accordance with a recognized standard.

3 Standards

When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of the tests.

4 Official and uncontrolled test documents

The official test documents of KEMA High-Power Laboratory are issued in bound form. Uncontrolled copies may be provided as loose sheets or as a digital file for convenience of reproduction by the client. The copyright has to be respected at all times.

5 Accuracy of measurement

In the table of test results the measured quantities are given in three digits. This method of presentation does not indicate an accuracy. The guaranteed uncertainty in the figures mentioned, taking into account the total measuring system, is less than 5%, unless mentioned otherwise.



RATINGS ASSIGNED BY THE MANUFACTURER

Voltage	24 kV (1)	
Normal current	200 A	
Number of poles	3	
Frequency	50/60 Hz	X
Short-time withstand current	10 kA	X
Peak withstand current	26 kA	X
Duration of short-circuit	1 s	X
Short-circuit making current	26 kA	X
Mainly active load breaking current	200 A	X
Closed-loop breaking current	200 A	X
Cable-charging breaking current	68 A	X
Pressure for interruption and insulation SF ₆ at 20 °C	0,14 MPa	
Supply voltage of closing and opening devices	110 Vd.c.	
Type of switch	General purpose switch	
Class (service position)	E1 (2)	X
Class (earth position)	E0	X

(1) On request of the client the tests have been based on a voltage of 25 kV.
(2) All breaking tests performed in accordance with class E3.

X = This rating has been proved by the tests of this Certificate.

DESCRIPTION OF APPARATUS TESTED

A three-phase three-position SF₆-insulated switch in a metal-enclosed switchgear unit

Minimum pressure for interruption and insulation at 20 °C	0,12 MPa
Maximum pressure for interruption and insulation at 20 °C	0,14 MPa

Mechanism:

Stored energy closing (springs, charged manually).
Stored energy opening (springs, charged at closing).

Supply voltage closing coil	110 Vd.c.
Supply voltage opening coil	110 Vd.c.

TRAVEL RECORDER

Travel recorder attached to main contact shaft. Linear with contact travel.



TIC 2044-12

TYPE TEST CERTIFICATE OF SHORT-CIRCUIT PERFORMANCE

APPARATUS A three-phase earthing switch in an air-insulated metal-enclosed switchgear unit

DESIGNATION Simosec World T-Panel SERIAL No. TBW3600002919-0013

Rated voltage	24 kV (1)	Rated making current peak	5,2 kA
Rated short-circuit current	2 kA	Rated frequency	50/60 Hz

(1) See note (1) on page 4.

MANUFACTURER Siemens Medium Voltage Switchgear Ltd., Wuxi, China

TESTED FOR Siemens AG, Frankfurt am Main, Germany

TESTED BY KEMA HIGH-POWER LABORATORY Utrechtseweg 310 - 6812 AR Arnhem - The Netherlands

DATE(S) OF TESTS 9 and 10 May 2012

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

IEC 62271-102 (2012) subclauses 6.6 (STC) and 6.101 (Making).

This Type Test Certificate has been issued by KEMA following exclusively the STL Guides.

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) and to justify the ratings assigned by the manufacturer as listed on page 4.

This Certificate applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate consists of 30 sheets in total.

© Copyright: Only integral reproduction of this Certificate is permitted without written permission from KEMA. Electronic copies in e.g. PDF-format or scanned version of this Certificate may be available and have the status "for information only". The sealed and bound version of the Certificate is the only valid version.

KEMA Nederland B.V. на основании чл. 36а, ал. 3 от ЗОП

S.M. Verhoeven Director Testing, Inspections & Certification The Netherlands

Arnhem, 10 July 2012



1 Certificate

A Certificate contains a record of a series of type tests carried out strictly in accordance with a recognized standard. The equipment tested has fulfilled the requirements of this standard and the relevant ratings assigned by the manufacturer are endorsed by KEMA. The Certificate is applicable only to the equipment tested. KEMA is responsible for the validity and the contents of the Certificate.

The responsibility for conformity of any apparatus having the same designation as the one tested rests with the manufacturer. The Certificate contains the essential drawings and a description of the equipment tested.

Detailed rules are given in KEMA's Certification procedure.

2 Report of Performance

A Report of Performance contains a record of one or more tests which have been carried out according to the client's instructions. These tests are not necessarily in accordance with a recognized standard. The test results do not verify ratings of the test object.

KEMA issues three types of Reports of Performance:

2.1 The tests have been carried out strictly in accordance with The apparatus has complied with the relevant requirements.

This sentence will appear on the front page of a Report of Performance if the tests have been performed in accordance with a recognized standard, but the series of tests does not completely fulfill the requirements for a Certificate of Compliance (for example, if the number of test duties is not a complete series of type tests). The Report contains verified drawings and a description of the equipment tested. Detailed rules are given in KEMA's Certification procedure. The condition of the test object after the tests is assessed and recorded in the Report.

2.2 The tests have been carried out in accordance with the client's instructions. Test procedure and test parameters were based on

This sentence will appear on the front page of a Report of Performance if the number of tests, the test procedure and the test parameters are based on a recognized standard and related to the ratings assigned by the manufacturer. If the apparatus does not pass the tests such behaviour will be mentioned on the front sheet. Verification of the drawings (if submitted) and assessment of the condition after the tests is only done on the client's request.

2.3 The tests have been carried out according to the client's instructions.

This sentence will appear on the front page of a Report of Performance if the tests, test procedure and/or test parameters are not in accordance with a recognized standard.

3 Standards

When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of the tests.

4 Official and uncontrolled test documents

The official test documents of KEMA High-Power Laboratory are issued in bound form. Uncontrolled copies may be provided as loose sheets or as a digital file for convenience of reproduction by the client. The copyright has to be respected at all times.

5 Accuracy of measurement

In the table of test results the measured quantities are given in three digits. This method of presentation does not indicate an accuracy. The guaranteed uncertainty in the figures mentioned, taking into account the total measuring system, is less than 5%, unless mentioned otherwise.



TIC 2044-12

IDENTIFICATION OF THE APPARATUS TESTED

Page 4

RATINGS ASSIGNED BY THE MANUFACTURER

Voltage	24 kV (1)	
Number of poles	3	
Frequency	50/60 Hz	X
Short-time withstand current	2 kA	X
Peak withstand current	5,2 kA	X
Duration of short-circuit	1 s	X
Short-circuit making current	5,2 kA	X
Class	E2	X

(1) On request of the client the tests have been based on a voltage of 25 kV.

X = This rating has been proved by the tests of this Certificate.

DESCRIPTION OF APPARATUS TESTED

A three-phase earthing switch in an air-insulated metal-enclosed switchgear unit

Mechanism:
Independent manual closing (springs).
Independent manual opening (springs).

For test purposes operated by robot, therefore no values of the opening and closing times are given in this Certificate.

TRAVEL RECORDER

No travel recorder fitted.



TIC 2031-12

TYPE TEST CERTIFICATE OF SHORT-CIRCUIT AND SWITCHING PERFORMANCE

APPARATUS A three-phase three-position SF₆-insulated switch in a metal-enclosed switchgear unit

DESIGNATION Simosec World R **SERIAL No.** TBW 3600002919-0001/K997,
TBW 3600002919-0001/K999,
TBW 3600002919-0006

Rated voltage	24 kV (1)	Rated normal current	800 A
Rated short-circuit current	20 kA (2)	Rated frequency	50/60 Hz

(1) See note (1) and (2) on page 6.

MANUFACTURER Siemens Medium Voltage Switchgear Ltd.,
Wuxi, China

TESTED FOR Siemens AG,
Frankfurt am Main, Germany

TESTED BY KEMA HIGH-POWER LABORATORY
Utrechtseweg 310 - 6812 AR Arnhem - The Netherlands

DATE(S) OF TESTS 5, 6, 7, 12, 13, 14 March and 7 May 2012

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

- IEC 62271-103** (2011) subclauses 6.6 (STC) and 6.101 (Making and breaking).
- IEC 62271-102** (2012) subclauses 6.6 (STC) and 6.101 (Making).

This Type Test Certificate has been issued by KEMA following exclusively the STL Guides.

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) and to justify the ratings assigned by the manufacturer as listed on page 6.

This Certificate applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate consists of 333 sheets in total.

© Copyright: Only integral reproduction of this Certificate is permitted without written permission from KEMA. Electronic copies in e.g. PDF-format or scanned version of this Certificate may be available and have the status "for information only". The sealed and bound version of the Certificate is the only valid version.

KEMA Nederland B.V.
 на основание чл. 36а, ал. 3 от ЗОП

S.A.M. Verhoeven
 Director Testing, Inspections &
 Certification The Netherlands

Arnhem, 4 July 2012

1 Certificate

A Certificate contains a record of a series of type tests carried out strictly in accordance with a recognized standard. The equipment tested has fulfilled the requirements of this standard and the relevant ratings assigned by the manufacturer are endorsed by KEMA. The Certificate is applicable only to the equipment tested. KEMA is responsible for the validity and the contents of the Certificate.

The responsibility for conformity of any apparatus having the same designation as the one tested rests with the manufacturer. The Certificate contains the essential drawings and a description of the equipment tested.

Detailed rules are given in KEMA's Certification procedure.

2 Report of Performance

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KEMA issues three types of Reports of Performance:

2.1 The tests have been carried out strictly in accordance with The apparatus has complied with the relevant requirements.

This sentence will appear on the front page of a Report of Performance if the tests have been performed in accordance with a recognized standard, but the series of tests does not completely fulfil the requirements for a Certificate of Compliance (for example, if the number of test duties is not a complete series of type tests). The Report contains verified drawings and a description of the equipment tested. Detailed rules are given in KEMA's Certification procedure. The condition of the test object after the tests is assessed and recorded in the Report.

2.2 The tests have been carried out in accordance with the client's instructions. Test procedure and test parameters were based on

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2.3 The tests have been carried out according to the client's instructions.

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3 Standards

When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of the tests.

4 Official and uncontrolled test documents

The official test documents of KEMA High-Power Laboratory are issued in bound form. Uncontrolled copies may be provided as loose sheets or as a digital file for convenience of reproduction by the client. The copyright has to be respected at all times.

5 Accuracy of measurement

In the table of test results the measured quantities are given in three digits. This method of presentation does not indicate an accuracy. The guaranteed uncertainty in the figures mentioned, taking into account the total measuring system, is less than 5%, unless mentioned otherwise.



RATINGS ASSIGNED BY THE MANUFACTURER

Voltage	24 kV (1)	
Normal current	800 A	
Number of poles	3	
Frequency	50/60 Hz	X
Short-time withstand current	20 kA (2)	X
Peak withstand current	52 kA (2)	X
Duration of short-circuit	3 s	X
Short-circuit making current	52 kA (2)	X
Mainly active load breaking current	800 A	X
Closed-loop breaking current	800 A	X
Line-charging breaking current	68 A	X
Cable-charging breaking current	68 A	X
Cable and Line-charging current under earth fault condition	118 A	X
Earth fault breaking current	204 A	X
Pressure for interruption and insulation SF ₆ at 20 °C	0,14 MPa	
Type of switch	General purpose switch	
Class (service position)	E3, C2	X
Class (earth position)	E2	X

X

- (1) On request of the client the tests have been based on a voltage of 25 kV.
- (2) On request of the client the tests have been based on a short-circuit current of 21 kA and 54,6 kApeak.

X = This rating has been proved by the tests of this Certificate.

Switch is also suitable to operate under earth fault conditions in systems with isolated neutral or in resonant earthed systems.

DESCRIPTION OF APPARATUS TESTED

A three-phase three-position SF₆-insulated switch in a metal-enclosed switchgear unit

Minimum pressure for interruption at 20 °C	0,12 MPa
Maximum pressure for interruption at 20 °C	0,14 MPa

Mechanism:
 Independent manual closing (springs).
 Independent manual opening (springs).
 For test purposes operated by robot, therefore no values of the opening and closing times are given in this Certificate.

TRAVEL RECORDER

Travel recorder attached to main contact shaft. Linear with contact travel.

Handwritten signature

Handwritten signature



TIC 2109-12

TYPE TEST CERTIFICATE OF SHORT-CIRCUIT PERFORMANCE

APPARATUS A three-phase switch-fuse combination consisting of a three-position SF₆-insulated load-break switch-disconnector in an air-insulated metal-enclosed switchgear

DESIGNATION Load-break switch-disconnector LBS 2 with drive mechanism ESSA 1, tested in SIMOSEC transformer panel type T

SERIAL No. TBW3600002919-0065, TBW3600002919-0066, TBW3600002919-0067

Rated voltage	24 kV (1)	Rated normal current	68 A (2)
Rated short-circuit breaking current	25 kA	Rated frequency	50/60 Hz

(1) See note (1) on page 5.
(2) See note (2) on page 5.

MANUFACTURER Siemens Medium Voltage Switchgear Ltd.,
Wuxi, China

TESTED FOR Siemens AG,
Frankfurt am Main, Germany

TESTED BY KEMA HIGH-POWER LABORATORY
Utrechtseweg 310 - 6812 AR Arnhem - The Netherlands

DATE(S) OF TESTS 26 and 27 July 2012

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

IEC 62271-105 (2002) subclauses 6.101.2.1 TD_{isc}, 6.101.2.2 TD_{IWmax} and 6.101.2.4 TD_{It}.

This Type Test Certificate has been issued by KEMA following exclusively the STL Guides.

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) and to justify the ratings assigned by the manufacturer as listed on page 5.

This Certificate applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate consists of 88 sheets in total.

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The sealed and bound version of the Certificate is the only valid version.

KEMA Nederland B.V.

на основании чл. 36а, ал. 3 от ЗОП

S.M. Verhoeven
Director Testing, Inspections &
Certification The Netherlands

Arnhem, 21 May 2013



1 Certificate

A Certificate contains a record of a series of type tests carried out strictly in accordance with a recognized standard. The equipment tested has fulfilled the requirements of this standard and the relevant ratings assigned by the manufacturer are endorsed by KEMA. The Certificate is applicable only to the equipment tested. KEMA is responsible for the validity and the contents of the Certificate.

The responsibility for conformity of any apparatus having the same designation as the one tested rests with the manufacturer. The Certificate contains the essential drawings and a description of the equipment tested.

Detailed rules are given in KEMA's Certification procedure.

2 Report of Performance

A Report of Performance contains a record of one or more tests which have been carried out according to the client's instructions. These tests are not necessarily in accordance with a recognized standard. The test results do not verify ratings of the test object.

KEMA issues three types of Reports of Performance:

2.1 The tests have been carried out strictly in accordance with The apparatus has complied with the relevant requirements.

This sentence will appear on the front page of a Report of Performance if the tests have been performed in accordance with a recognized standard, but the series of tests does not completely fulfil the requirements for a Certificate of Compliance (for example, if the number of test duties is not a complete series of type tests). The Report contains verified drawings and a description of the equipment tested. Detailed rules are given in KEMA's Certification procedure. The condition of the test object after the tests is assessed and recorded in the Report.

2.2 The tests have been carried out in accordance with the client's instructions. Test procedure and test parameters were based on

This sentence will appear on the front page of a Report of Performance if the number of tests, the test procedure and the test parameters are based on a recognized standard and related to the ratings assigned by the manufacturer. If the apparatus does not pass the tests such behaviour will be mentioned on the front sheet. Verification of the drawings (if submitted) and assessment of the condition after the tests is only done on the client's request.

2.3 The tests have been carried out according to the client's instructions.

This sentence will appear on the front page of a Report of Performance if the tests, test procedure and/or test parameters are not in accordance with a recognized standard.

3 Standards

When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of the tests.

4 Official and uncontrolled test documents

The official test documents of KEMA High-Power Laboratory are issued in bound form. Uncontrolled copies may be provided as loose sheets or as a digital file for convenience of reproduction by the client. The copyright has to be respected at all times.

5 Accuracy of measurement

In the table of test results the measured quantities are given in three digits. This method of presentation does not indicate an accuracy. The guaranteed uncertainty in the figures mentioned, taking into account the total measuring system, is less than 5%, unless mentioned otherwise.



RATINGS ASSIGNED BY THE MANUFACTURER

Voltage	24 kV (1)	
Normal current	68 A (2)	
Number of poles	3	
Frequency	50/60 Hz	X
Short-circuit breaking current	25 kA	X
Short-circuit making current	65 kA	X
Duration of short-circuit	2 s	
Transfer current	1400 A	
Take-over current	1400 A	X
Pressure for interruption and insulation SF ₆ at 20 °C	0,14 MPa	

Fuse-link:

Manufacturer	SIBA
Designation	3002243.100
Voltage	24 kV
Normal current	100 A
Breaking capacity	63 kA
Type of fuse striker	Medium Energy
Certificate	1244.0144.1.049

(1) On request of the client the tests have been based on a voltage of 25 kV.
(2) Normal current refers to fuse-link SIBA designation 3002243.100.

X = This rating has been proved by the tests of this Certificate.

DESCRIPTION OF APPARATUS TESTED

A three-phase switch-fuse combination consisting of a three-position SF₆-insulated load-break switch-disconnector in an air-insulated metal-enclosed switchgear
Designation of the apparatus tested: Load-break switch-disconnector LBS 2.05-B with drive mechanism ESSA 1.01, tested in SIMOSEC transformer panel type T

Minimum pressure for interruption and insulation at 20 °C	0,12 MPa
Maximum pressure for interruption and insulation at 20 °C	0,14 MPa

Mechanism:
Stored energy closing (springs, charged manually).
Stored energy opening (springs, charged at closing).

Supply voltage closing coil	110 Vd.c.
Supply voltage opening coil	110 Vd.c.

TRAVEL RECORDER

Travel recorder attached to main contact shaft. Linear with contact travel.

Приложение 3 към Техническо предложение

СРОКОВЕ ЗА ДОСТАВКА

№	Наименование	Мярка	Количество със срок на доставка до 7 кал. дни	Количество със срок на доставка до 30 кал. дни
1	2	3		4
1	КРУ 24(25)/630/16, SF6 тов. прекъсвач - К	бр.	1	2
2	КРУ 12/630/16, SF6 тов. прекъсвач - К	бр.	1	2
3	КРУ 24(25)/630/16, SF6 тов. прекъсвач - Т	бр.	1	2
4	КРУ 12/630/16, SF6 тов. прекъсвач - Т	бр.	1	2
5	КРУ 24(25)/630/16, SF6 тов. прекъсвач - ШС	бр.	1	1
6	КРУ 12/630/16, SF6 тов. прекъсвач - ШС	бр.	1	1
7	КРУ 24(25)/630/16, SF6 тов. прекъсвачи - ККТ	бр.	1	1
8	КРУ 12/630/16, SF6 тов. прекъсвачи - ККТ	бр.	1	1
9	КРУ 24(25)/630/16, SF6 тов. прекъсвачи - КККТ	бр.	1	1
10	КРУ 12/630/16, SF6 тов. прекъсвачи - КККТ	бр.	1	1
11	КРУ 24(25)/630/16, SF6 тов. прекъсвачи - ККТТ	бр.	1	1
12	КРУ 12/630/16, SF6 тов. прекъсвачи - ККТТ	бр.	1	1
13	Капак краен/ляв или десен/	бр.	В зависимост от срока на доставка на модула КРУ за окомплектоване	В зависимост от срока на доставка на модула КРУ за окомплектоване
14	Връзки шинни 630А, компл.за КРУ	бр.	В зависимост от срока на доставка на модула КРУ за окомплектоване	В зависимост от срока на доставка на модула КРУ за окомплектоване
15	Лост за управление, КРУ 24kV	бр.	В зависимост от срока на доставка на модула КРУ за окомплектоване	В зависимост от срока на доставка на модула КРУ за окомплектоване
16	Изкл.боб.за КРУ24/630/16, тов.прек.-Т	бр.	В зависимост от срока на доставка на модула КРУ за окомплектоване	В зависимост от срока на доставка на модула КРУ за окомплектоване
17	Моторно задвижване за телеуправл. На КРУ	бр.	В зависимост от срока на доставка на модула КРУ за окомплектоване	В зависимост от срока на доставка на модула КРУ за окомплектоване

18	Укзател за сфазирание	бр.	В зависимост от срока на доставка на модула КРУ за окомплектоване	В зависимост от срока на доставка на модула КРУ за окомплектоване
19	К-т каб.гл.за КРУ, за модул „К“, 20kV, 185m ²	бр.	В зависимост от срока на доставка на модула КРУ за окомплектоване	В зависимост от срока на доставка на модула КРУ за окомплектоване
20	К-т каб.гл.за КРУ, за модул „К“, 20kV, 95m ²	бр.	В зависимост от срока на доставка на модула КРУ за окомплектоване	В зависимост от срока на доставка на модула КРУ за окомплектоване

Забележки:

- 1/ Срокът на доставките започва да тече от датата на изпращане на поръчката.
- 2/ Количествата в колона 4, със срок на доставка до 7 /седем/ календарни дни, се доставят след SAP поръчка до посочените в обявлението складове на Възложителя за покриване на спешни нужди на Възложителя.
- Възложителят може да поръчва посоченото спешно количество веднъж месечно.
- 3/ В случай, че крайният срок на доставката съвпада с празничен или неработен ден, то доставката се извършва не по-късно от първия работен ден след изтичането на срока.
- 4/ При поръчки на Възложителя на количества в рамките на потвърдените от Изпълнителя и недоставени в посочените срокове, ще бъдат налагани неустойки, съгласно условията на договора.
- 5/ Възложителят може да поръча количества по-малки от посочените в колони 4 и 5.
- 6/ Възложителят може да поръчва количества по-високи от посочените в колони 4 и 5, като това обстоятелство ще бъде посочено текстово в съответната поръчка изпратена към Изпълнителя. С потвърждението на поръчката, Изпълнителят вписва в същата очаквана дата за доставка на количествата надвишаващи посочените в колони 4 и 5.
- 7/ Количествата за доставка в колони 4 и 5 са отделни и независими едно от друго.
- 8/ Количествата за доставка в колона 5 не включват в себе си количествата за доставка в колона 4.
- 9/ Възложителят има право да направи едновременно поръчки за доставка на количества от колони 4 и 5.

- Забележка:**
1. При необходимост, когато се поръча КРУ за охрана трансформатор и се поръча изключвателна бобина, при доставката бобината да бъде монтирана вътре в КРУ-то;
 2. При необходимост, когато се поръча КРУ с моторче за телеуправление, то трябва да пристигне оборудвано заедно с моторчето.
 3. Сроковете на доставка на резервните части, предвид окомплектоването, са съобразно сроковете на доставка на комплектните комутационни устройства

на основание чл. 36а, ал. 3 от ЗОП

на основание чл. 36а, ал. 3 от ЗОП

д-р инж. Боряна Манолова
Управител
Сименс ЕООД



Орлин Александров
Управител
Сименс ЕООД

18.03.2020 г.

гр. София

(Handwritten signatures)

