

Typetest matrix SIMOSEC

rated voltage [kV]	rated short-time withstand current [kA]	rated short-circuit duration [s]	rated normal current [A]	rated frequency [Hz]	type of panel	additional feature	dielectric tests (6.2)	temperature rise test (6.5) and measurement of the resistance of the circuits (6.4)	short-time withstand current and peak withstand current tests (6.6)	verification of making and breaking capacities (6.101)	mechanical operation tests (6.102)	mechanical tests (6.102)	test to verify the proper function of the position indicating device 6271-102 subclause 6.105 (6.102)	verification of the protection (6.7)	pressure withstand test of gas-filled compartments (6.103)	lightness tests (6.8)	internal arcing test (classification IAC) (6.106)	mechanical impact (6.7)	Dielectric tests on cable testing circuits (6.2.101)
24	16	1	630	50	R		main circuits and control circuits auxiliary and control circuits	12097F-8 12098F-1 12098F-2 12185F-1 12185F-2	main / earthing circuit (three-phase) earthing circuit (single-phase)	IEC 62271-103: Making and breaking operations on ES/TPS IEC 62271-102 short-circuit making and breaking operations on ES/TPS IEC 62271-100	12063F 12063F 12065F 12065F	switching devices interlocks and removable parts	6271-102 subclause 6.105	Verification of the IP coding (6.7.1)	compartments (6.103)	lightness tests (6.8)	internal arc test free-standing 3 panels arrangement (A-FLR), 21kA/1s upwards. gas filled compartment cable connection compartment busbar compartment	12004F 12004F 12004F 12004F	13032F 13032F 13032F 13032F
24	16	1	630	50	R(T)		main circuits and control circuits auxiliary and control circuits	12097F-8 13066F-1 12014F-1 12014F-2 12014F-3 12014F-4 12014F-5 12014F-6 12014F-7 12014F-8 12014F-9 12014F-10 12014F-11 12014F-12 12014F-13 12014F-14 12014F-15 12014F-16 12014F-17 12014F-18 12014F-19 12014F-20 12014F-21 12014F-22 12014F-23 12014F-24 12014F-25 12014F-26 12014F-27 12014F-28 12014F-29 12014F-30 12014F-31 12014F-32 12014F-33 12014F-34 12014F-35 12014F-36 12014F-37 12014F-38 12014F-39 12014F-40 12014F-41 12014F-42 12014F-43 12014F-44 12014F-45 12014F-46 12014F-47 12014F-48 12014F-49 12014F-50 12014F-51 12014F-52 12014F-53 12014F-54 12014F-55 12014F-56 12014F-57 12014F-58 12014F-59 12014F-60 12014F-61 12014F-62 12014F-63 12014F-64 12014F-65 12014F-66 12014F-67 12014F-68 12014F-69 12014F-70 12014F-71 12014F-72 12014F-73 12014F-74 12014F-75 12014F-76 12014F-77 12014F-78 12014F-79 12014F-80 12014F-81 12014F-82 12014F-83 12014F-84 12014F-85 12014F-86 12014F-87 12014F-88 12014F-89 12014F-90 12014F-91 12014F-92 12014F-93 12014F-94 12014F-95 12014F-96 12014F-97 12014F-98 12014F-99 12014F-100	main / earthing circuit (three-phase) earthing circuit (single-phase)	IEC 62271-103: Making and breaking operations on ES/TPS IEC 62271-102 short-circuit making and breaking operations on ES/TPS IEC 62271-100	12063F 12063F 12065F 12065F	switching devices interlocks and removable parts	6271-102 subclause 6.105	Verification of the IP coding (6.7.1)	compartments (6.103)	lightness tests (6.8)	internal arc test free-standing 3 panels arrangement (A-FLR), 21kA/1s upwards. gas filled compartment cable connection compartment busbar compartment	12004F 12004F 12004F 12004F	13032F 13032F 13032F 13032F
24	16	1	200	50	T		main circuits and control circuits auxiliary and control circuits	12097F-8 13066F-1 12014F-1 12014F-2 12014F-3 12014F-4 12014F-5 12014F-6 12014F-7 12014F-8 12014F-9 12014F-10 12014F-11 12014F-12 12014F-13 12014F-14 12014F-15 12014F-16 12014F-17 12014F-18 12014F-19 12014F-20 12014F-21 12014F-22 12014F-23 12014F-24 12014F-25 12014F-26 12014F-27 12014F-28 12014F-29 12014F-30 12014F-31 12014F-32 12014F-33 12014F-34 12014F-35 12014F-36 12014F-37 12014F-38 12014F-39 12014F-40 12014F-41 12014F-42 12014F-43 12014F-44 12014F-45 12014F-46 12014F-47 12014F-48 12014F-49 12014F-50 12014F-51 12014F-52 12014F-53 12014F-54 12014F-55 12014F-56 12014F-57 12014F-58 12014F-59 12014F-60 12014F-61 12014F-62 12014F-63 12014F-64 12014F-65 12014F-66 12014F-67 12014F-68 12014F-69 12014F-70 12014F-71 12014F-72 12014F-73 12014F-74 12014F-75 12014F-76 12014F-77 12014F-78 12014F-79 12014F-80 12014F-81 12014F-82 12014F-83 12014F-84 12014F-85 12014F-86 12014F-87 12014F-88 12014F-89 12014F-90 12014F-91 12014F-92 12014F-93 12014F-94 12014F-95 12014F-96 12014F-97 12014F-98 12014F-99 12014F-100	main / earthing circuit (three-phase) earthing circuit (single-phase)	IEC 62271-103: Making and breaking operations on ES/TPS IEC 62271-102 short-circuit making and breaking operations on ES/TPS IEC 62271-100	12063F 12063F 12065F 12065F	switching devices interlocks and removable parts	6271-102 subclause 6.105	Verification of the IP coding (6.7.1)	compartments (6.103)	lightness tests (6.8)	internal arc test free-standing 3 panels arrangement (A-FLR), 21kA/1s upwards. gas filled compartment cable connection compartment busbar compartment	12004F 12004F 12004F 12004F	13032F 13032F 13032F 13032F
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# PEHLA

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

## Test Report

Report No.: 11212Fr-1

Copy No.: 0

Contents: 24 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 / 60 Hz
Rated peak	52,5 kA /	Rated short-time		Rated duration of	
withstand current:	54,6 kA	withstand current:	21 kA	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: 20 December 2011

Applied test specifications:

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

and according client's instruction

Tests performed:

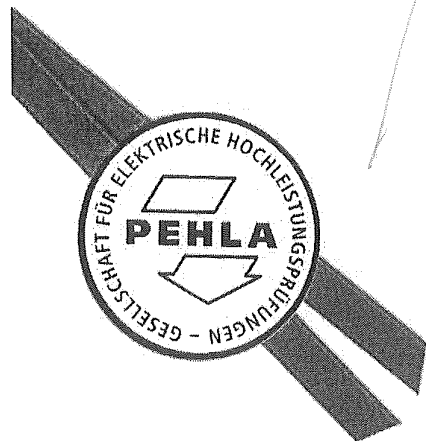
Type Test "Internal arcing test" of the gas-filled compartment

Testing under conditions of arcing due to an internal fault according classification IAC AFLR 21 kA 1s. Three-phase arc initiation within the gas-filled compartment with a peak current of 54,7 kA and a short-circuit current of 21,9 kA – 1,01 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

Mannheim, 04 April 2013

The test results relate only to the items tested.

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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).

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### 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

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.

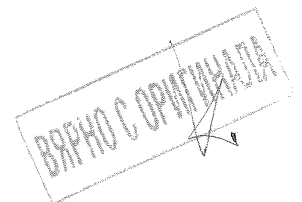
### Addresses

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68219 Mannheim  
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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  
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 mm<sup>2</sup>.

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

**Test Results**

(continuation from sheet 1)

**Test no. 11212Fr / 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 gas-filled compartment tested.



# PEHLA

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

## Test Report

Report No.: 11212Fr-2

Copy No.: 0

Contents: 24 Sheets

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

Designation: Ring-cable panel type R

Rated voltage:	17,5 kV	Rated normal current:	630 A	Rated frequency:	50 / 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: 20 December 2011

Applied test specifications:

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

and according client's instruction

Tests performed:

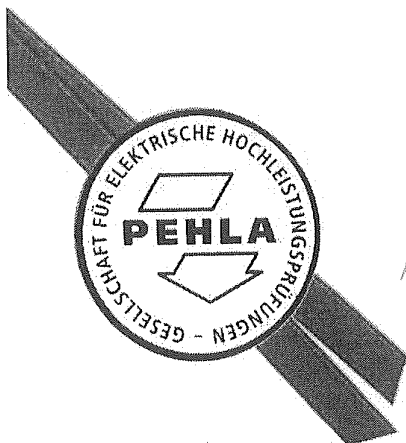
Type Test "Internal arcing test" of the busbar compartment

Testing under conditions of arcing due to an internal fault according classification IAC AFLR 21 kA 1s. Three-phase arc initiation within the busbar compartment with a peak current of 56,4 kA and a short-circuit current of 22,1 kA – 1,00 s ( $I_A = 21,0$  kA – 1,06 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.



На основании чл.36а ал.3 от ЗОП

Mannheim, 04 April 2013

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D-PL-12072-01-01



## Notes

### Accreditation

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#### A Test Confirmation

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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.

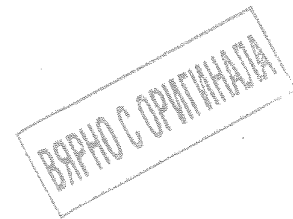
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Manufacturer: SIEMENS Medium Voltage Switching  
Technologies (Wuxi) Ltd.  
manufactured at: 12, Hanjiang Road  
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China

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 mm<sup>2</sup>.

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

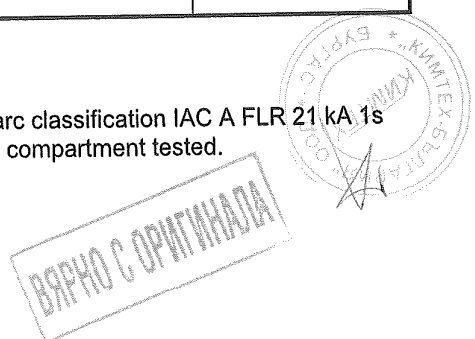
### Test Results

(continuation from sheet 1)

Test no. 11212Fr / 05

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 busbar compartment tested.



# 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 2) 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

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

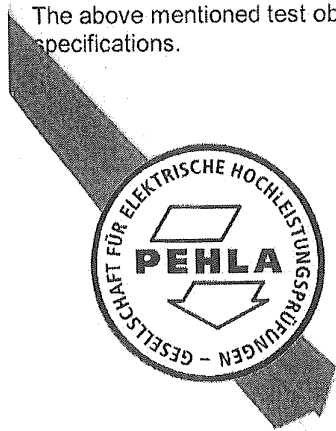
**Tests performed:**

Type test "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

На основании чл.36а ал.3 от ЗОП

Mannheim, 17 February 2012

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## Notes

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Internet: www.pehla.com

Testing Station: PEHLA-Testing Laboratory  
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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.: 12010Fr-1

Copy No.: 0

Contents: 13 Sheets

**Test object:** Metal-enclosed switchgear, air insulated, extendable  
**Designation:** SIMOSEC, gas-filled compartment of ring-main panel type R, assembled in an upper sectional part of the switchgear (top-kit)  
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:** 11 to 19 April 2012

**Applied test specifications:**

IEC 62271-200: 2011-10, clause 6.8

IEC 62271-1: 2011-08, clause 6.8

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

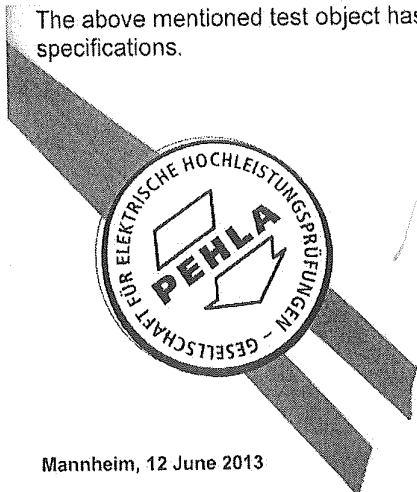
**Tests performed:**

Type test "Tightness tests before and after mechanical operation test"

1. Tightness test of gas-filled compartment before the mechanical operation test
2. Mechanical operation test with the ring-main panel type R (1000 CLOSE - OPEN and 1000 EARTHED - OPEN operating cycles for the three-position switch-disconnector and it's earthing function)
3. Tightness test of gas-filled compartment after the mechanical operation test

**Test results:**

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



Mannheim, 12 June 2013

На основании чл.36а ал.3 от ЗОП

The test results relate only to the items tested.

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02PE1303\_fr1305



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

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), KERI (KR), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the frame-work 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

Client: Siemens Aktiengesellschaft,  
Berlin and Munich

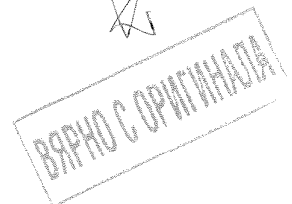
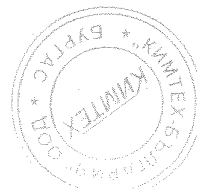
Testing Station: PEHLA-Testing Laboratory  
Frankfurt am Main  
Carl-Benz-Straße 22  
60386 Frankfurt am Main  
Germany

**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.: 12011Fr-1

Copy No.: 0

Contents: 13 Sheets

**Test object:** Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable  
**Designation:** Topkit with gas-filled compartment of transformer feeder panel type T  
Rated voltage: 24 kV Rated normal current: - 1) Rated frequency: 50 Hz / 60 Hz  
Rated peak 62,5 kA / Rated short-time Rated duration of  
withstand current: 65 kA 2) withstand current: 25 kA 2) short-circuit: 2 s 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 Medium Voltage Switching Technologies (Wuxi) Ltd.

**Testing station:** PEHLA-Testing Laboratory Frankfurt am Main

**Date of test:** 24 to 27 January 2012

**Applied test specifications:**

IEC 62271-200: 2011-10, clause 6.8

IEC 62271-1: 2007-10, clause 6.8

DIN EN 62271-1 (VDE 0671, Teil 1) 2009-08,  
Abschnitt 6.8

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

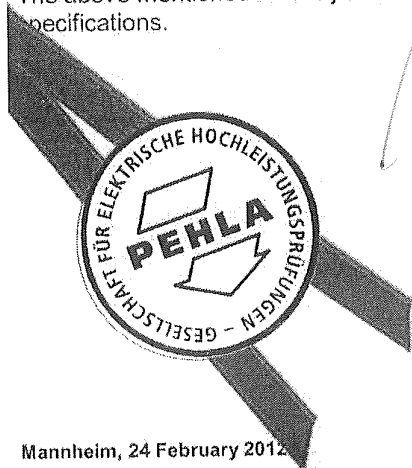
**Tests performed:**

Type test "Tightness test "

1. Tightness test of gas-filled compartment before the mechanical operations
2. Mechanical operations with the three-position switch-disconnector of the test object (1000 operating cycles CLOSE - OPEN and 1000 operating cycles EARTHED - OPEN with its earthing function)
3. Tightness test of gas-filled compartment after the mechanical operations

**Test results:**

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



Mannheim, 24 February 2012

GESELLSCHAFT FÜR ELEKTRISCHE  
HOCHLEISTUNGSPRÜFUNGEN

На основании чл.36а ал.3 от ЗОП

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Deutsche  
Akkreditierungsstelle  
D-PL-12072-01-01

## Notes

### Accreditation

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### Addresses

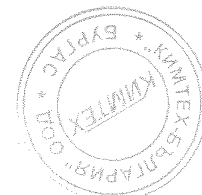
Office: PEHLA-Geschäftsstelle  
Hallenweg 40  
68219 Mannheim  
Germany  
Internet: www.pehla.com

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 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.: 12012Fr

Copy No.: 0

Contents: 11 Sheets

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

**Designation:** Gas-filled compartment of ring-main panel type R

Rated voltage:	24 kV	Rated normal current:	630 A	Rated frequency:	50/60 Hz
Rated peak withstand current:	62,5/65 kA	Rated short-time withstand current:	25 kA	Rated duration of short-circuit:	2 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:** 7 February 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:**

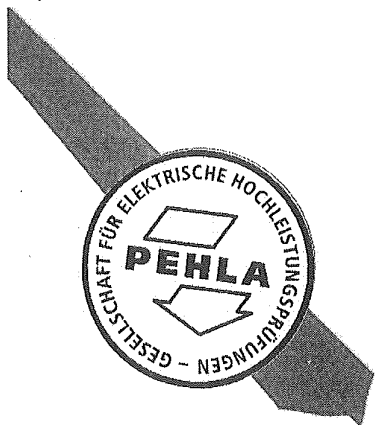
Type test "Pressure withstand tests for gas-filled compartments"

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

Technical Committee

Mannheim, 17 February 2012

The test results relate only to the items tested.

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## 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

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### PEHLA-Documents

#### A Type Test Certificate

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#### A Test Confirmation

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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.

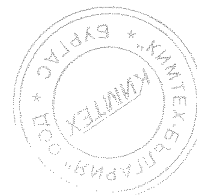
### Addresses

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.: 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 withstand current: 52,5 kA /      Rated short-time withstand current: 21 kA      2)      Rated duration of short-circuit: 3 s      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.

**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

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**

A Type Test Certificate

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A Test Document

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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

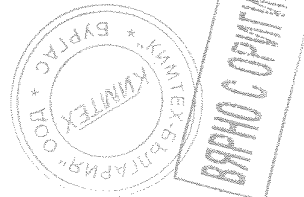
Testing Station: PEHLA-Testing Laboratory  
Frankfurt am Main  
Carl-Benz-Straße 22  
60386 Frankfurt am Main  
Germany

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.: 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  
IEC 62271-1: 2007-10, clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6  
IEC 62271-105: 2002-08, clauses 6.4 and 6.5

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 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  
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.

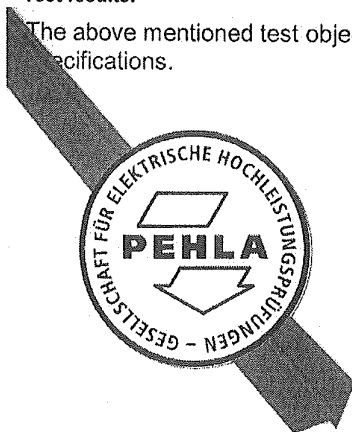
**Tests performed:**

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

Mannheim, 05 April 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

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### Addresses

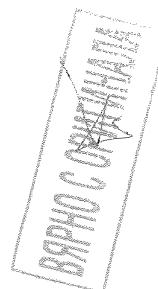
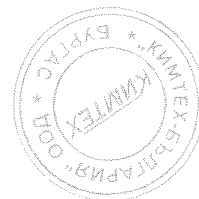
Office: PEHLA-Geschäftsstelle  
Hallenweg 40  
68219 Mannheim  
Germany  
Internet: www.pehla.com

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.: 12014Fr-4

Copy No.: 0

Contents: 19 Sheets

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

Designation: Transformer feeder panel type T with HV HRC fuse-links type SIBA 3002243.140  
(10/24 kV; 140 A; e = 442 mm)

Rated voltage:	24 kV	Rated normal current:	76 A	1)	Rated frequency:	60 Hz	
Rated peak		Rated short-time			Rated duration of		
withstand current:	52 kA	2) withstand current:	20 kA	2)	short-circuit:	4 s	2)

1) The rated normal current 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 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

IEC 62271-1: 2007-10, clauses 6.4.1,  
6.5.1 - 6.5.4 and 6.5.6

IEC 62271-105: 2002-08, clauses 6.4 and 6.5

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10,  
Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 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

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.

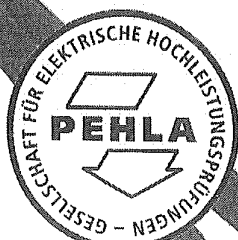
### Tests performed:

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 76 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

Technical Committee

Mannheim, 05 April 2012

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DAKKS

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

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.

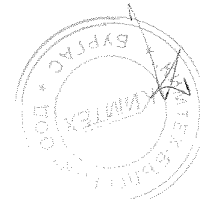
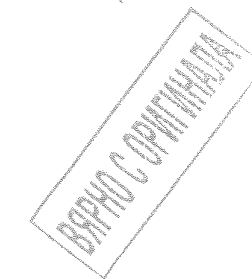
### Addresses

Office: PEHLA-Geschäftsstelle  
Hallenweg 40  
68219 Mannheim  
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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 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.: 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 /      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:**

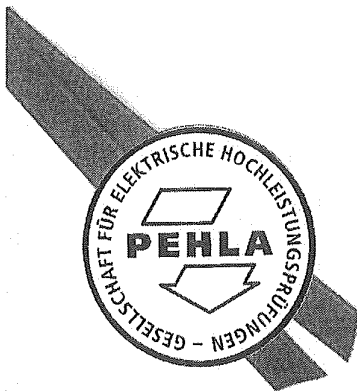
Type test "Short-time withstand current and peak withstand current tests" at 50 Hz:

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 п.3 от 30П

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

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.

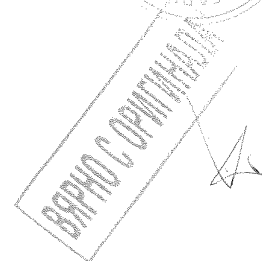
### Addresses

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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

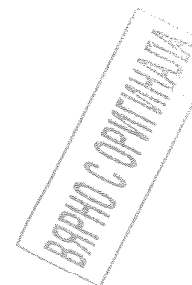
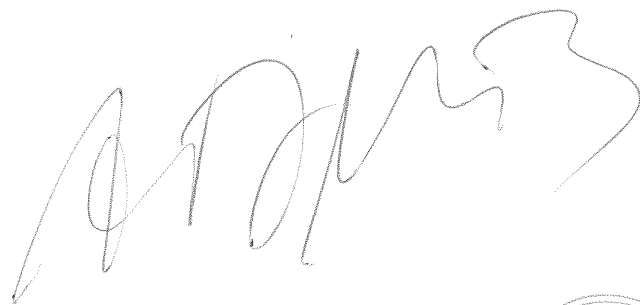
Test 12022Fr / 03:

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.: 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: 50 kA /      Rated short-time:      Rated duration of  
withstand current: 52,5 kA      withstand current: 20 kA      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  $\mu$ s

(continued on sheet 3)

**Test results:**

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



GESE  
HO

На основании чл.36а ал.3 от ЗОП

Mannheim, 08 October 2012

The test results relate only to the items tested.

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DAKKS

Deutsche  
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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

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### PEHLA-Documents

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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.

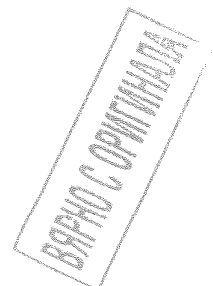
### Addresses

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 and Test Results

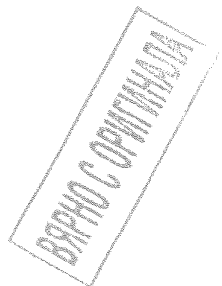
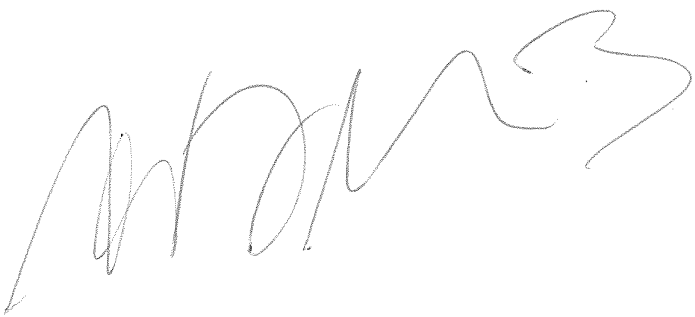
(continuation from sheet 1)

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  $\mu$ s
  - phase to earth with  $\pm 125$  kV
  - across the contact gaps with  $\pm 125$  kV
  - across the isolating distance with  $\pm 145$  kV



# PEHLA

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

## Test Document

Report No.: 12063Fr

Copy No.: 0

Contents: 11 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:** 30 May 2012

**Applied test specifications:**

IEC 62271-200: 2011-10, clause 6.102

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 "Mechanical operation tests":

1. Switching devices and removable parts  
The three-position switch-disconnector of the test object was operated 50 times.  
The cable compartment cover was inserted and removed 25 times.
2. Mechanical and electromechanical interlocks  
The interlocks between the three-position switch-disconnector and the cover of the cable compartment of the test object were tested 50 times.

**Test results:**

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



Mannheim, 24 May 2013

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

На основании чл.36а ал.3 от ЗОП



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## Notes

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### PEHLA-Documents

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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

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68219 Mannheim  
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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.: 12065Fr

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  
withstand current: 54,6 kA      2) withstand current: 21 kA      2) Rated duration of short-circuit: 3 s      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.

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

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 08 May 2012

Applied test specifications:

IEC 62271-200: 2011-10, clauses 6.102

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 "Mechanical operation tests":

1. Switching devices and removable parts

The three-position switch-disconnector of the test object was operated 50 times.  
The cable compartment cover was inserted and removed 25 times.

2. Mechanical and electromechanical interlocks

The interlocks between the three-position switch-disconnector the charging spring, the earthing function, the trip linkage of the fuses, the locking device and the cover of the cable compartment of the test object were tested 50 times.

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 п.3 от 30П

Mannheim, 24 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**

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), KERI (KR), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the frame-work 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

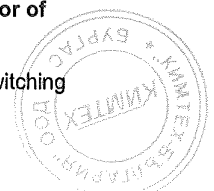
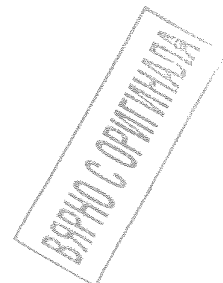
is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

**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**

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



# 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.



*[Handwritten signature]*  
GESELLSCHAFT FÜR ELEKTRISCHE  
HOCHLEISTUNGSPRÜFUNGEN

На основании чл.36а ал.3 от ЗОП



Mannheim, 16 May 2013

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02PE1303\_fr1305





## Notes

### Accreditation

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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

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 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      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.

**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

Mannheim, 16 May 2013

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03PE1303\_fr1305



## 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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#### A Test Confirmation

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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

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 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  
withstand current: 54,6 kA      2) withstand current: 21 kA      2) short-circuit: 3 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 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:**

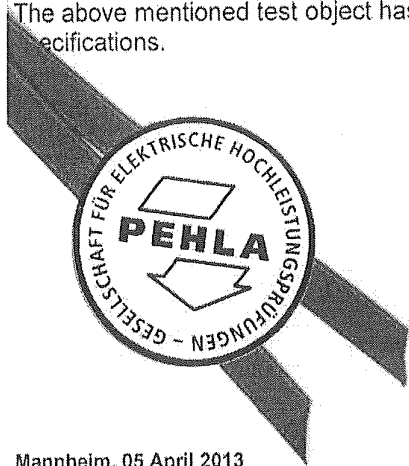
Type Test "Internal arcing test" of the cable connection compartment

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 ( $I_A = 21,0$  kA – 1,05 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 пп.3 от ЗОП

Mannheim, 05 April 2013

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03PE0804\_fr1104



## Notes

### Accreditation

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### PEHLA-Documents

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### Uncertainty of the measurement systems

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### Addresses

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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 mm<sup>2</sup>.

The three-phase arc initiation was above the installed HV HRC fue-links 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 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

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. 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

Mannheim, 24 April 2013

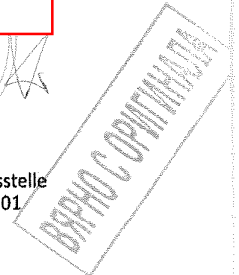
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DAKkS

Deutsche  
Akkreditierungsstelle  
D-PL-12072-01-01



## Notes

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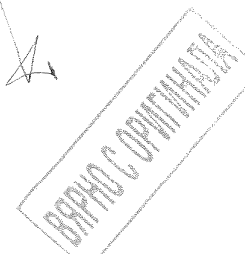
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### Addresses

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 <b>as shareholder and contractor of PEHLA GbR</b>
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 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:**

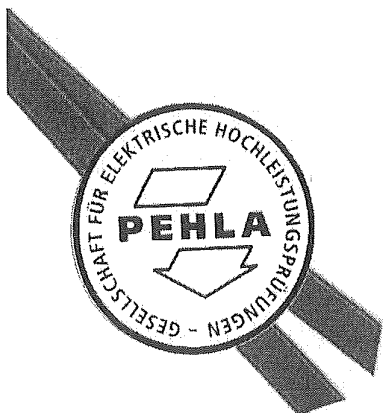
Type Test "Internal arcing test" of the cable connection compartment

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 ( $I_A = 21,0$  kA – 1,03 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.



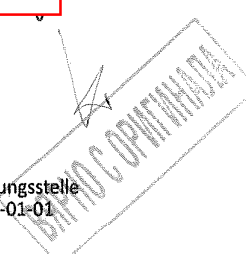
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GESELLSCHAFT FÜR ELEKTRISCHE  
HOCHLEISTUNGSPRÜFUNGEN

На основании чл.36а ал.3 от ЗОП

Mannheim, 08 April 2013

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## Notes

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### STL-Member

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### PEHLA-Documents

#### A Type Test Certificate

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### Uncertainty of the measurement systems

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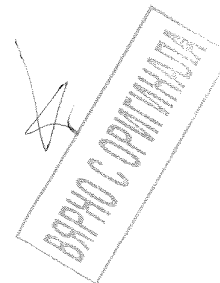
### Addresses

Office: PEHLA-Geschäftsstelle  
Hallenweg 40  
68219 Mannheim  
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Internet: [www.pehla.com](http://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 mm<sup>2</sup>.

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

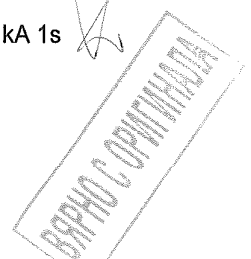
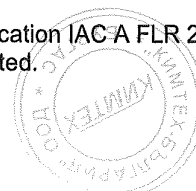
### Test Results

(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  $\geq$  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.: 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.

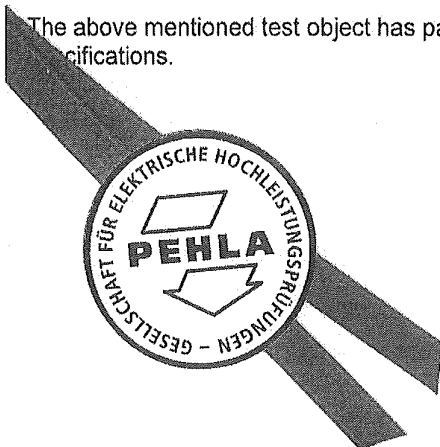
**Tests performed:**

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  $\mu$ s  
- phase-to-earth and between phases with  $\pm 125$  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

Mannheim, 23 November 2012

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Deutsche  
Akkreditierungsstelle  
D-PL-12072-01-01



## Notes

### Accreditation

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### Addresses

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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 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 / 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  $\mu$ s  
- phase-to-earth and between phases with  $\pm 125$  kV

**Test results:**

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

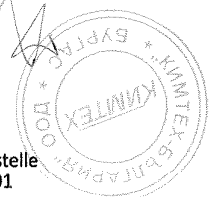
Mannheim, 07 March 2013

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D-PL-12072-01-01



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### Accreditation

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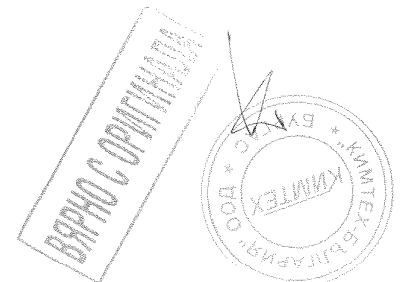
### Addresses

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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.: 12185Fr

Copy No.: 0

Contents: 12 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.  
**Tested for:** SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.  
**Testing station:** PEHLA-Testing Laboratory Frankfurt am Main  
**Date of test:** 10 December 2012

**Applied test specifications:**

IEC 62271-200: 2011-10, clause 6.2

DIN EN 62271-200 (VDE 0671 Teil 200): 2012-08, Abschnitt 6.2.10

IEC 62271-1: 2011-08, clause 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 "Dielectric tests on auxiliary and control circuits":

Power frequency voltage test 50 Hz, 1 min

- between the auxiliary and control circuits and earth with 2 kV

**Test results:**

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



Mannheim, 14 March 2013

GESELLSCHAFT FÜR ELEKTRISCHE  
HOCHLEISTUNGSPRÜFUNGEN

На основании чл.36а ал.3 от 30П

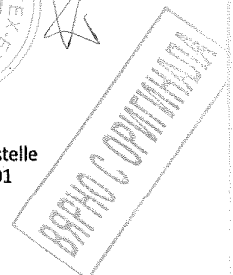
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## Notes

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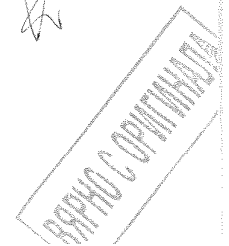
### Addresses

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Client: Siemens AG  
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# 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 /      Rated short-time withstand current: 20 kA      Rated duration of short-circuit: 4 s  
withstand current: 52 kA  
**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  
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На основании чл.36а ал.3 от ЗОП

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## Notes

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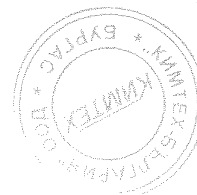
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Client: Siemens Aktiengesellschaft, Berlin and Munich  
Letters to:  
Siemens AG  
Infrastructure & Cities Sector  
Low and Medium Voltage Division  
Medium Voltage & Systems  
Mozartstr. 31c  
91052 Erlangen  
Germany



## 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:

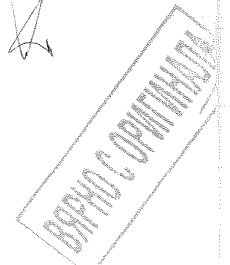
Three-phase short-time withstand current and peak withstand current test of the earthing circuit from the feeder bushings of the ring-main panel type R1 over the three-position switch-disconnector in EARTHED-position with a peak withstand current of 51,4 kA, a short-time withstand current of 20,3 kA 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 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: 52,5kA/      Rated short-time      Rated duration of  
withstand current: 54,6 kA      2) withstand current: 21 kA      2) short-circuit: 3 s      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.

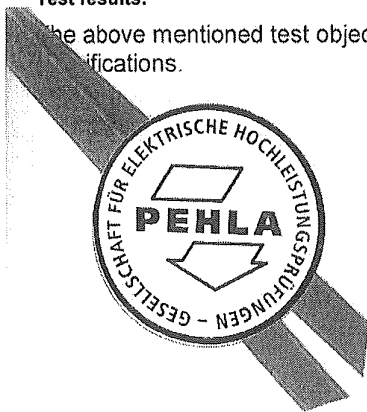
**Tests performed:**

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  $\mu$ s  
phase-to-earth and across the contact gaps with  $\pm 125$  kV and across the isolating distance with  $\pm 145$  kV

**Test results:**

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



На основании чл.36а ал.3 от ЗОП

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

The test results relate only to the items tested.

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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**

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.

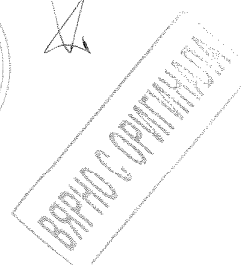
**Addresses**

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



# 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      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.

**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 disconnecter acc. client's instructions by performing:

1. Direct voltage  $\pm$  48 kV against power frequency voltage 24 kV test at 50 Hz - 30 min
2. Direct voltage  $\pm$  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.



Mannheim, 15 March 2013

GESELLSCHAFT FÜR ELEKTRISCHE  
HOCHLEISTUNGSPRÜFUNGEN

На основании чл.36а ал.3 от 30П

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D-PL-12072-01-01



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A Test Confirmation

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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**

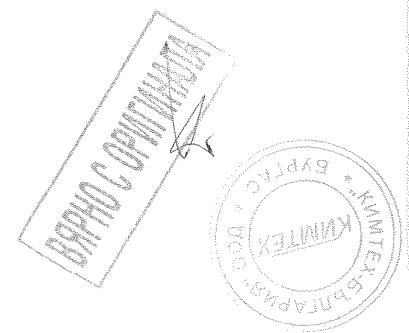
Office: PEHLA-Geschäftsstelle  
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68219 Mannheim  
Germany  
Internet: www.pehla.com

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.: 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 disconnecter acc. client's instructions by performing:

1. Direct voltage  $\pm 48$  kV against power frequency voltage 24 kV test at 50 Hz - 30 min
2. Direct voltage  $\pm 76$  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.



*[Handwritten signature]*

GESELLSCHAFT FÜR ELEKTRISCHE

На основании чл.36а ал.3 от ЗОП

Mannheim, 19 March 2013

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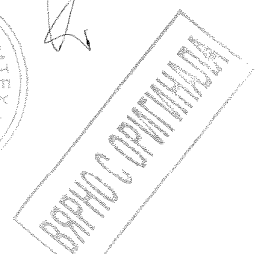
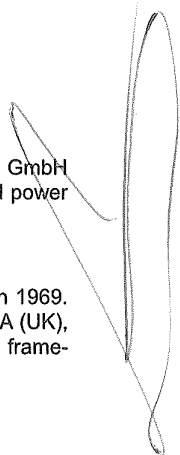
**Addresses**

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Hallenweg 40  
68219 Mannheim  
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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.: 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.

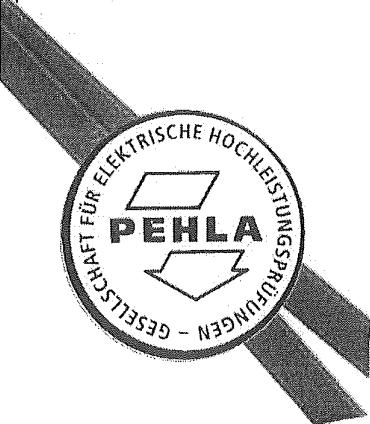
**Tests performed:**

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.



Mannheim, 26 April 2013

GESELLSCHAFT FÜR ELEKTRISCHE  
HOCHLEISTUNGSPRÜFUNGEN

На основании чл.36а ал.3 от ЗОП

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## Notes

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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

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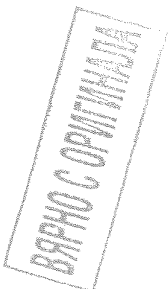
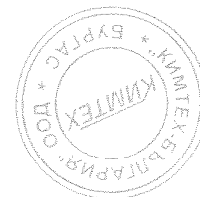
### Addresses

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Hallenweg 40  
68219 Mannheim  
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Internet: www.pehla.com

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





TIC 2031-12

**TYPE TEST CERTIFICATE OF SHORT-CIRCUIT AND SWITCHING PERFORMANCE**

**APPARATUS** A three-phase three-position SF<sub>6</sub>-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.

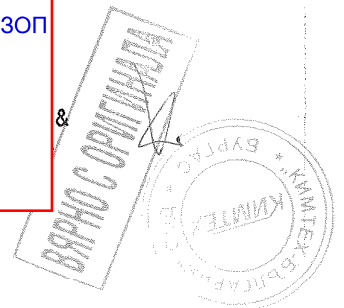
The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above Standard(s) and to justify the ratings assigned by the manufacturer as listed on page 6.

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.

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

На основание чл.36а ал.3 от ЗОП



**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**

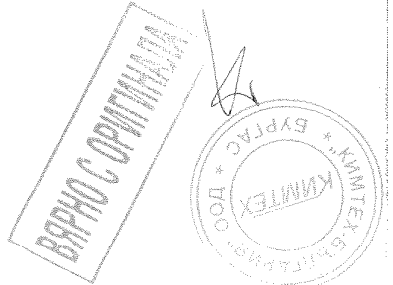
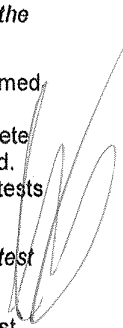
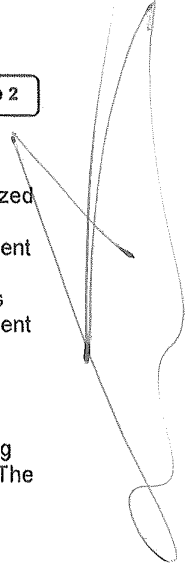
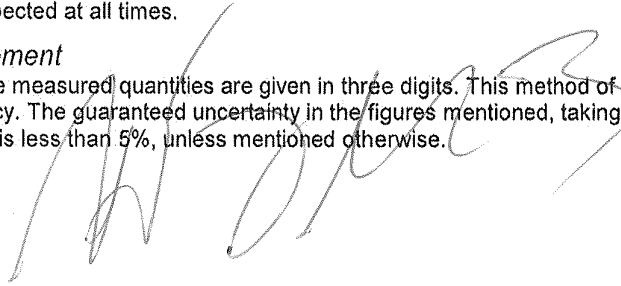
When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of the tests.

**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	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 <sub>6</sub> at 20 °C	0,14 MPa	
Type of switch	General purpose switch	
Class (service position)	E3, C2	X
Class (earth position)	E2	X

*[Handwritten signature]*

- (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 kA<sub>peak</sub>.

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 SF<sub>6</sub>-insulated switch in a metal-enclosed switchgear unit

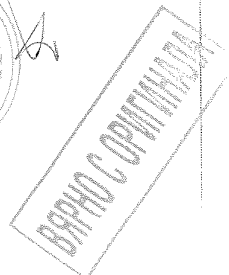
Minimum pressure for interruption at 20 °C	0,12 MPa
Maximum pressure for interruption at 20 °C	0,14 MPa

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.

*[Handwritten signature]*

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.

На основании чл.36а ал.3 от ЗОП







**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**

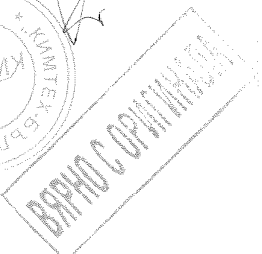
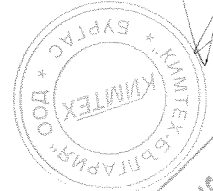
When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of the tests.

**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)	
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

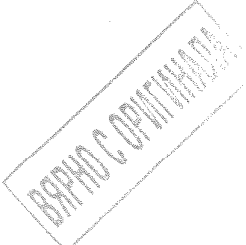
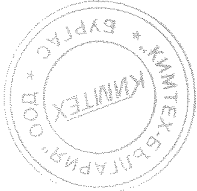
**Mechanism:**

- 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 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).

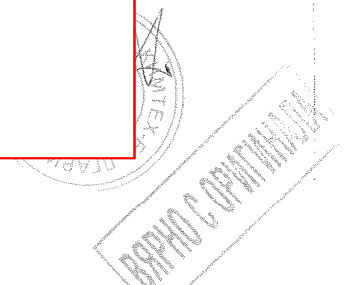
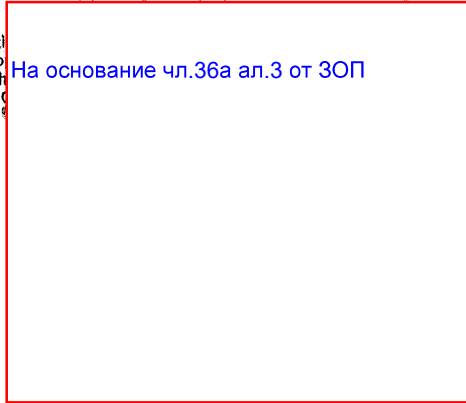
This Type Test Certificate has been issued by KEMA following exclusively the STL Guides.

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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### 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 <sub>6</sub> 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

*[Handwritten signature]*

(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 SF<sub>6</sub>-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.

*[Handwritten signature]*





TIC 2109-12

TYPE TEST CERTIFICATE OF SHORT-CIRCUIT PERFORMANCE

APPARATUS A three-phase switch-fuse combination consisting of a three-position SF<sub>6</sub>-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<sub>isc</sub>, 6.101.2.2 TD<sub>IWmax</sub> and 6.101.2.4 TD<sub>Ilo</sub>.

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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На основании чл.36а ал.3 от ЗОП

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**

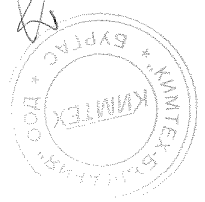
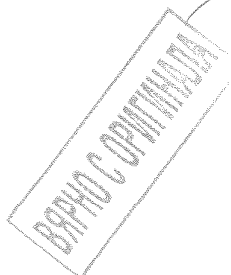
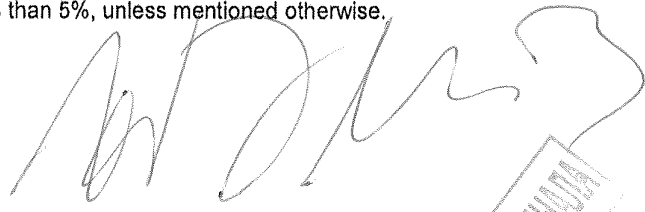
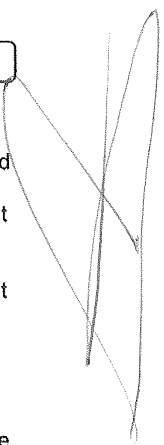
When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of the tests.

**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.





TIC 2109-12

IDENTIFICATION OF THE APPARATUS TESTED

Page 5

**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 <sub>6</sub> 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 SF<sub>6</sub>-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.







Кимтех България ООД  
1113 гр. София  
ул. Акад. Георги Бончев № 20

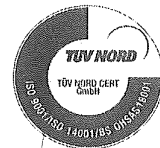
кабели, трансформатори,  
электрооборудване,  
проектиране, изграждане и  
наладка на  
електросъоръжения

тел: 02 9733373  
факс: 02 9733370  
web: www.kimtech.bg  
e-mail: office@kimtech.bg

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 <sup>2</sup>	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 <sup>2</sup>	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

Дата 17.03.2020 г.

(име и фамилия)

(длъжност на представляващия участник)

ПОД

На основание чл.36а ал.3 от ЗОП

