

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:

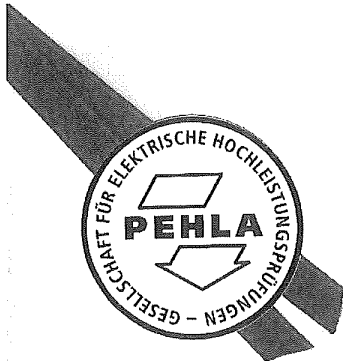
Type test "Short-time withstand current and peak withstand current tests" at 50 Hz:

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, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 21 February 2012

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Tests Performed

(Continuation from sheet 1)

1. Test on main circuit

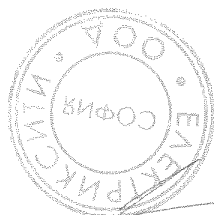
Test 12022Fr / 03:

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).



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

Test Document

Report No.: 12029Fr-1

Copy No.: 0

Contents: 22 Sheets

Test object: Metal-enclosed switchgear Type SIMOSEC, air insulated, extendable
Designation: Corepart and cable connection compartment of ring-main feeder panel type R
Rated voltage: 24 kV Rated normal current: 800 A Rated frequency: 50 Hz / 60 Hz
Rated peak withstand current: 50 kA / Rated short-time withstand current: 20 kA Rated duration of short-circuit: 4 s
withstand current: 52,5 kA

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 μ s

(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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на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 08 October 2012

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281

Tests Performed and Test Results

(continuation from sheet 1)

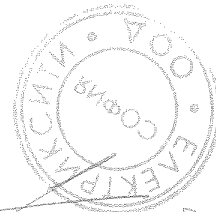
1. Power frequency voltage test 50 Hz, 1 min
 - phase to earth with 50 kV
 - across the contact gaps with 50 kV
 - across the isolating distance with 60 kV

and according client's instructions

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

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

ВЯРНО С ОРИГИНАЛА



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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.



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Management Committee

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Technical Committee

Mannheim, 24 May 2013

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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 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: 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.

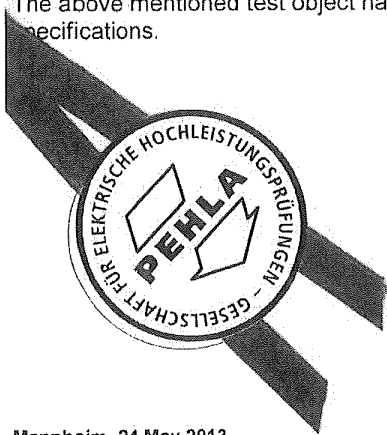
Tests performed:

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.



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Mannheim, 24 May 2013

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ВЕРНО С ОРИГИНАЛОМ

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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.



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на основании чл. 36а, ал. 3 от ЗОП

Management Committee

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Technical Committee

Mannheim, 16 May 2013

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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.



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Management Committee

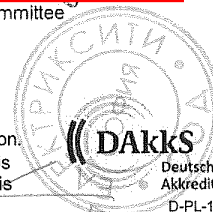
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Technical Committee

Mannheim, 16 May 2013

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290

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Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Report

Report No.: 12083Fr

Copy No.: 0

Contents: 26 Sheets

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

Designation: Transformer panel type T

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

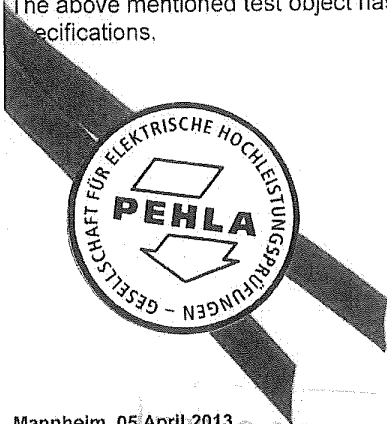
Type Test "Internal arcing test" of the cable connection compartment

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 ($I_A = 21,0 \text{ kA} - 1,05 \text{ s}$ 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.



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HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 05 April 2013

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Tests performed

(continuation from sheet 1)

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

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

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

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

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

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

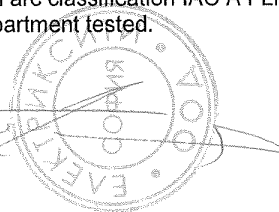
Test Results

(continuation from sheet 1)

Test no. 12083Fr / 03

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

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



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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

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 24 April 2013

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

Test Report

Report No.: 12103Fr

Copy No.: 0

Contents: 23 Sheets

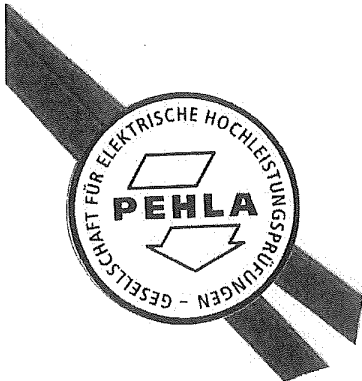
Test object: Metal-enclosed switchgear type SIMOSEC, air insulated, extendable
Designation: Ring-main panel type R
Rated voltage: 17,5 kV Rated normal current: 630 A Rated frequency: 50 Hz / 60 Hz
Rated peak withstand current: 52,5 kA / Rated short-time withstand current: 21 kA Rated duration of short-circuit: 3 s
withstand current: 54,6 kA
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.



GESELLSCHAFT FÜR ELEKTRISCHE
HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

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Technical Committee

Mannheim, 08 April 2013

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Tests performed

(continuation from sheet 1)

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

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

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

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

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

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

Test Results

(continuation from sheet 1)

Test no. 12103Fr / 03

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

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

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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 / 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 Medium Voltage Switching Technologies (Wuxi) Ltd.

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 10 October 2012

Applied test specifications:

IEC 62271-200: 2011-10, clause 6.2

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

IEC 62271-1: 2011-08, clause 6.2

and according client's instructions

und nach Angaben des Auftraggebers

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

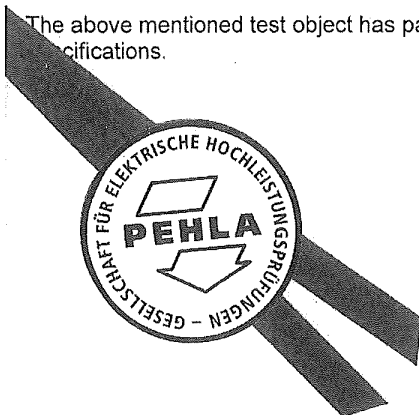
Tests performed:

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

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

Test results:

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



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HOCHLEISTUNGSPRÜFUNGEN

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Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 23 November 2012

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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 / Rated short-time withstand current: 21 kA Rated duration of short-circuit: 3 s
Manufacturer: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
Tested for: SIEMENS Medium Voltage Switching Technologies (Wuxi) Ltd.
Testing station: PEHLA-Testing Laboratory Frankfurt am Main
Date of test: 07 November 2012

Applied test specifications:

IEC 62271-200: 2011-10, clause 6.2

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

IEC 62271-1: 2011-08, clause 6.2

and according client's instructions

und nach Angaben des Auftraggebers

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

Tests performed:

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

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

Test results:

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



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на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 07 March 2013

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302

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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 / 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.



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Management Committee

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Technical Committee

Mannheim, 14 March 2013

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304

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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
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:

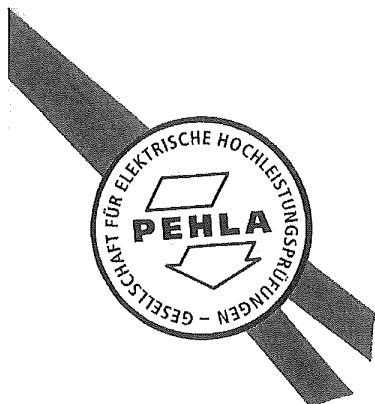
Type test "Short-time withstand current and peak withstand current tests" at 50 Hz:

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

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HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

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306

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.



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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.

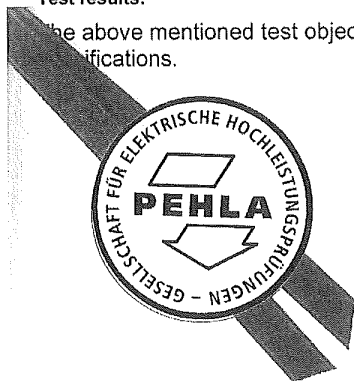
Tests performed:

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 μ s
phase-to-earth and across the contact gaps with ± 125 kV and across the isolating distance with ± 145 kV

Test results:

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



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HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

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Technical Committee

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

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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 disconnector acc. client's instructions by performing:

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

Test results:

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



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HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

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Technical Committee

Mannheim, 15 March 2013

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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: 52,5kA Rated short-time withstand current: 21 kA Rated duration of short-circuit: 3 s
withstand current: 54,6 kA
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 ± 48 kV against power frequency voltage 24 kV test at 50 Hz - 30 min
2. Direct voltage ± 76 kV against power frequency voltage 24 kV test at 50 Hz - 15 min

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основании чл. 36а, ал. 3 от ЗОП

Management Committee

на основании чл. 36а, ал. 3 от ЗОП

Technical Committee

Mannheim, 19 March 2013

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313

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Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 13066Fr-1

Copy No.: 0

Contents: 28 Sheets

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

Designation: Circuit-breaker transfer panel type L(T) with ring-main transfer panel type R(T), CT+CT

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

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

Client: SIEMENS AG

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 22 to 24 April 2013

Applied test specifications:

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

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

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

Tests performed:

Type test "Temperature rise":

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

Test results:

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



GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

на основание чл. 36а, ал. 3 от ЗОП

Management Committee

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Technical Committee

Mannheim, 26 April 2013

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315