SIVACON S4 Low-Voltage Power Distribution Board

IEC 61439 design verification

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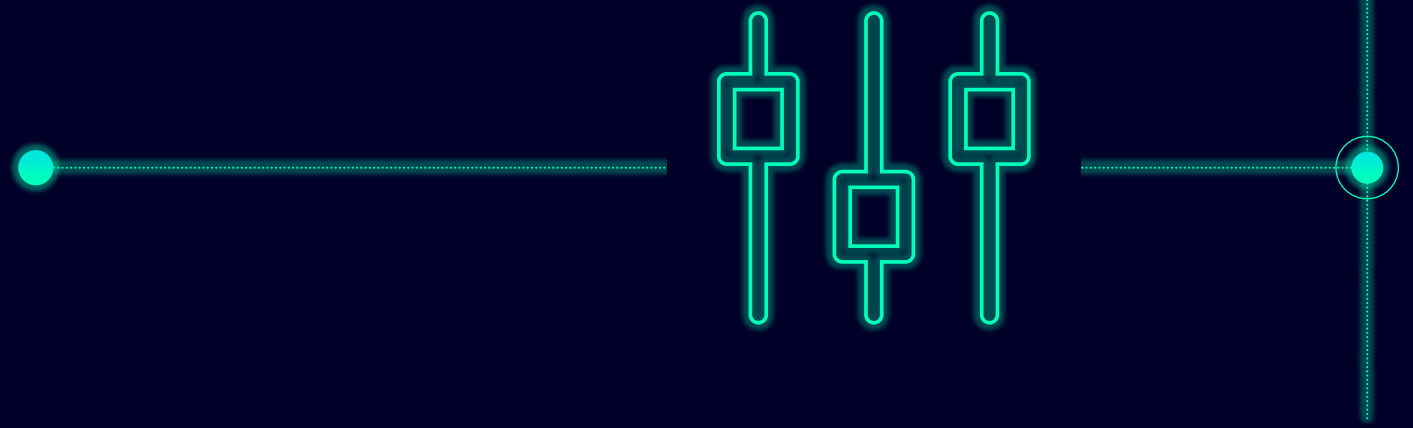
Standards and responsibility of IEC 61439



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IEC 61439 architecture
Replaced standards

IEC 61439-1

General rules

Replaces IEC 60439-1

IEC 61439-2	IEC 61439-3	IEC 61439-4	IEC 61439-5	IEC 61439-6
Power switchgear and controlgear assemblies	Distribution boards	Assemblies for construction sites	Assemblies for power distribution	Busbar trunking systems
Replaces IEC 60439-1	Replaces EC 60439-3	Replaces IEC 60439-4	Replaces EC 60439-5	Replaces IEC 60439-2

SIVACON

ALPHA

ALPHA

SIVACON

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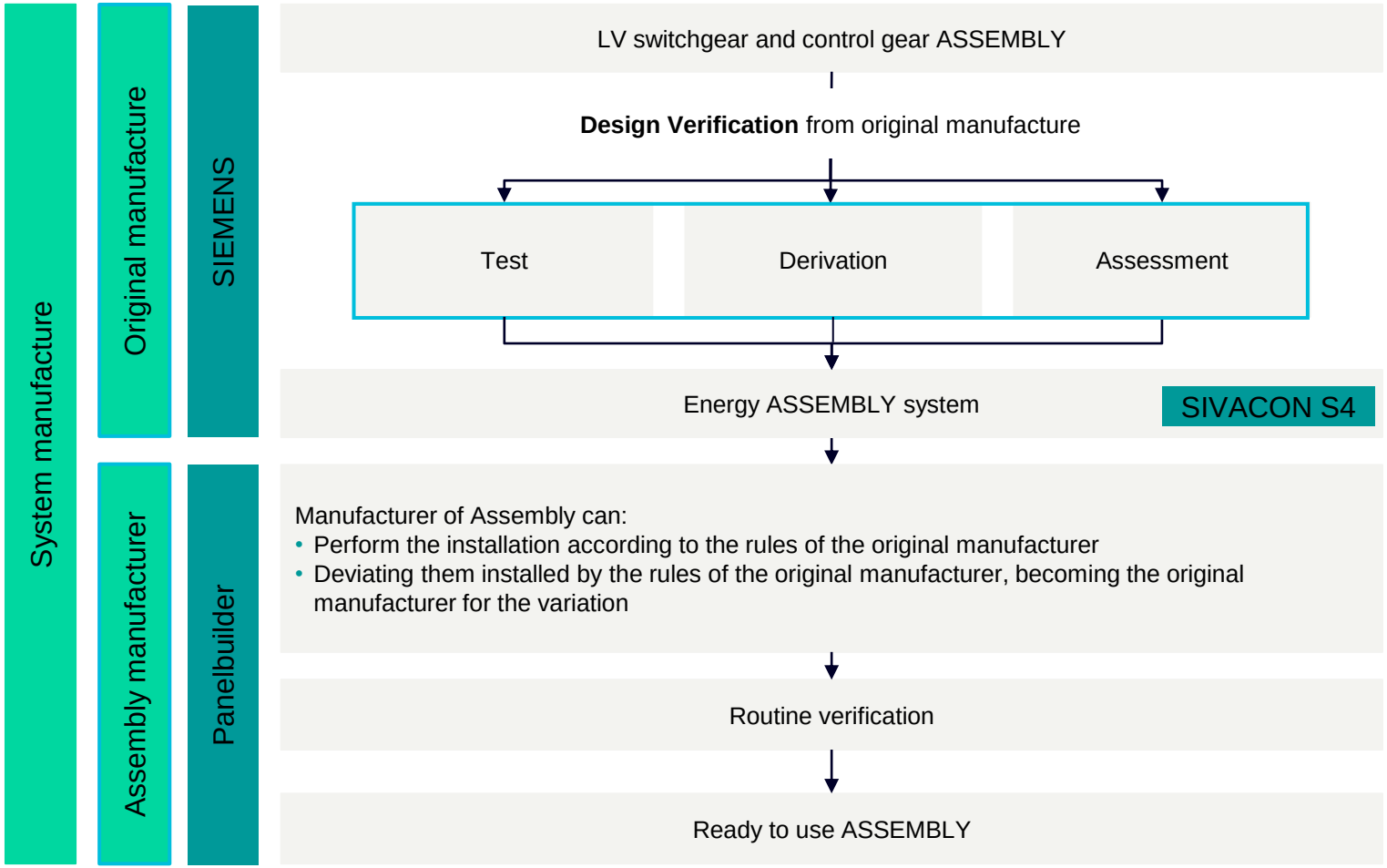
IEC 61439 Responsibility of manufacture



Overview
Test methods

Design verification

Table D.1 – List of design verifications to be performed

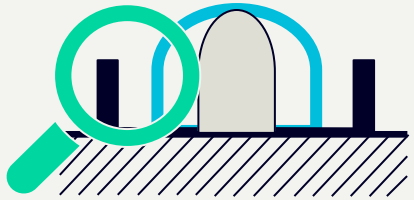
No.	Characteristic to be verified	Clauses or subclauses	Verification options available		
			Testing	Comparison with a reference design	Assessment
1	Strength of material and parts:	10.2			
	Resistance to corrosion	10.2.2	YES	NO	NO
	Properties of insulating materials:	10.2.3			
	Thermal stability	10.2.3.1	YES	NO	NO
	Resistance to abnormal heat and fire due to internal electric effects	10.2.3.2	YES	NO	YES

Test

Comparison with reference design

"Worst case" scenario will be tested and covers the rest of the system.

Assessment



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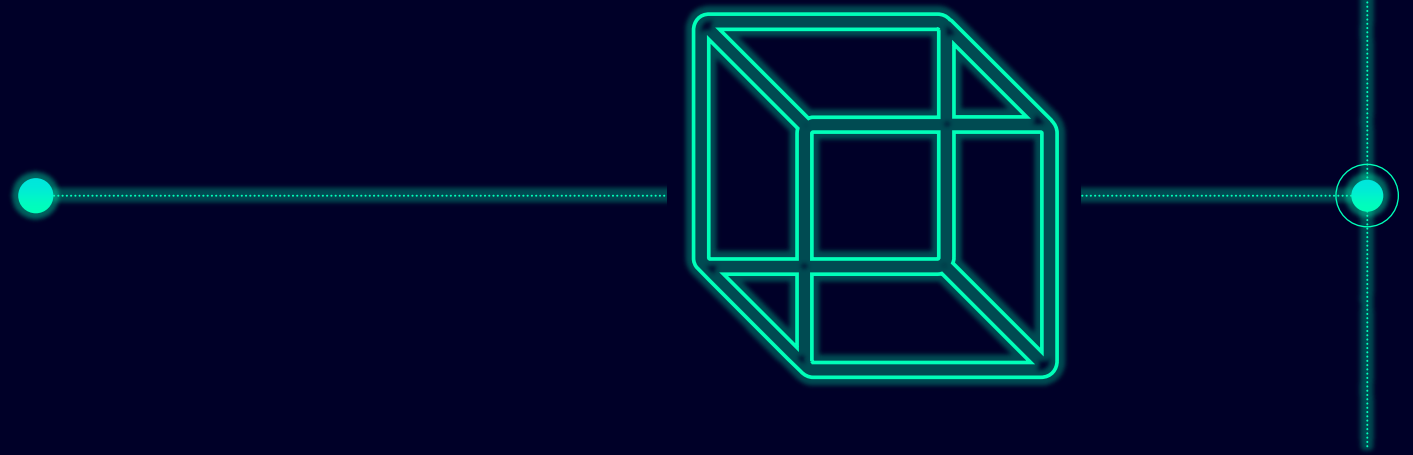
IEC 61439 @SIVACON S4



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Overview
Tests according to IEC 61439

10.1	**General introduction**
10.2	Strength of materials and parts
13.3	Degree of protection of assemblies
10.4	Clearances and creepage distances
10.5	Protection against electric shock and integrity of protective circuits
10.6	Incorporation of switching devices and components
10.7	Internal electrical circuits and connections
10.8	Terminals for external conductors
10.9	Dielectric properties
10.10	Verification of temperature rise
10.11	Short-circuit withstand strength
10.12	Electromagnetic compatibility (EMC)
10.13	Mechanical operation

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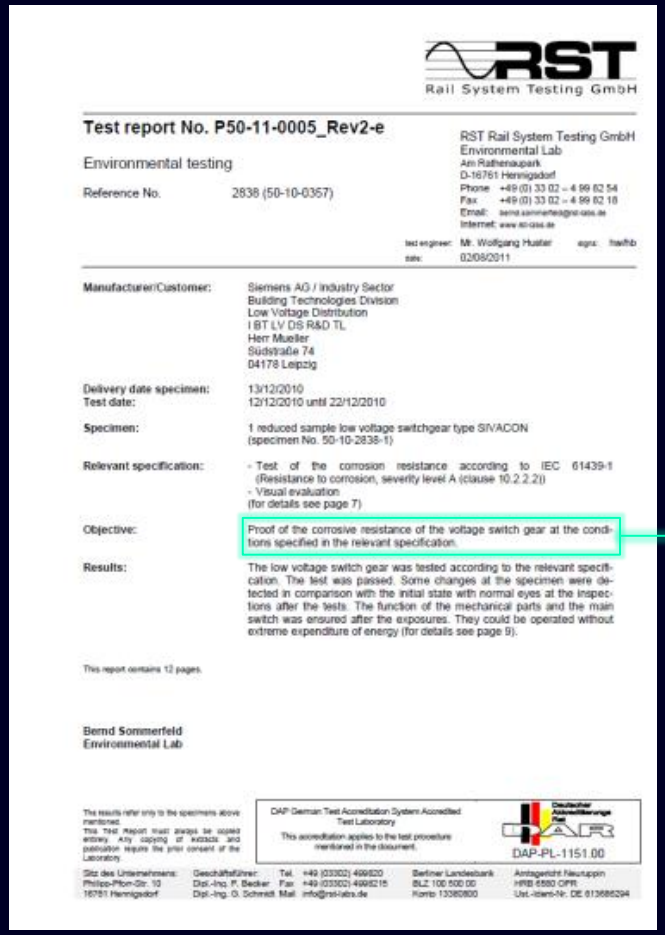
IEC 61439 @SIVACON S4
Verification of material and parts (10.2)

Resistance to corrosion



RST
Rail System Testing GmbH

Test report No. P50-11-0005_Rev2-e

Environmental testing

Reference No. 2838 (50-10-0357)

RST Rail System Testing GmbH
Environmental Lab
Am Rathenaupark
D-16761 Hennigsdorf
Phone +49 (0) 33 02 – 4 99 82 54
Fax +49 (0) 33 02 – 4 99 82 18
Email: bernd.sommerfeld@rst-labs.de
Internet: www.rst-labs.de

test engineer: Mr. Wolfgang Hueter sign.: hw/hb
date: 02/08/2011

Manufacturer/Customer: Siemens AG / Industry Sector
Building Technologies Division
Low Voltage Distribution
I BT LV DS R&D TL
Herr Mueller
Südstraße 74
04178 Leipzig

Delivery date specimen: 13/12/2010
Test date: 12/12/2010 until 22/12/2010

Specimen: 1 reduced sample low voltage switchgear type SIVACON (specimen No. 50-10-2838-1)

Relevant specification:
- Test of the corrosion resistance according to IEC 61439-1 (Resistance to corrosion, severity level A (clause 10.2.2.2))
- Visual evaluation
(for details see page 7)

Objective: Proof of the corrosive resistance of the voltage switch gear at the conditions specified in the relevant specification.

Results: The low voltage switch gear was tested according to the relevant specification. The test was passed. Some changes at the specimen were detected in comparison with the initial state with normal eyes at the inspections after the tests. The function of the mechanical parts and the main switch was ensured after the exposures. They could be operated without extreme expenditure of energy (for details see page 9).

This report contains 12 pages.

Bernd Sommerfeld
Environmental Lab

This results refer only to the specimens above mentioned.
This Test Report must always be copied entirely. Any copying of extracts and publication requires the prior consent of the Laboratory.

DAP German Test Accreditation System Accredited Test Laboratory
This accreditation applies to the test procedure mentioned in the document.
DAP-PL-1151.00

Sitz des Unternehmens: Philips-Pfort-Str. 10, 16761 Hennigsdorf
Geschäftsführer: Dipl.-Ing. F. Becker, Dipl.-Ing. O. Schmidt
Tel. +49 (03302) 499820, Fax +49 (03302) 499821, Mail info@rst-labs.de
Berliner Landesbank, BLZ 100 500 00, Konto 13380800
Amtsgericht Neuruppin, HRB 6580 OPR, Ust.-Ident-Nr. DE 813686294

- Test of the corrosion resistance according to IEC 61439-1 (Resistance to corrosion, severity level A (clause 10.2.2.2)
- Visual evaluation

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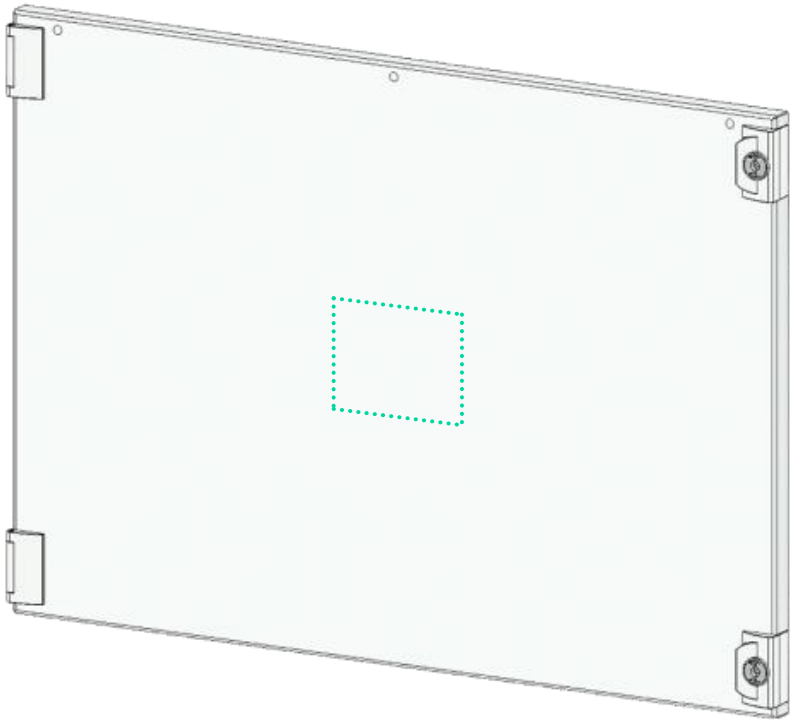
IEC 61439 @SIVACON S4
Verification of material and parts (10.2)

Resistance to corrosion



In case of door cut-outs

- Corrosion protection on cutting edges need to be recovered
- Suitable systems are available at specialist shops e.g.: BRILLUX painting systems

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IEC 61439 @SIVACON S4
Verification of material and parts (10.2)

UV test required by outdoor plastic parts

Manufactured of steel metal sheets, S4 is designed for indoor application
So it's not relevant for SIVACON S4

Not applicable

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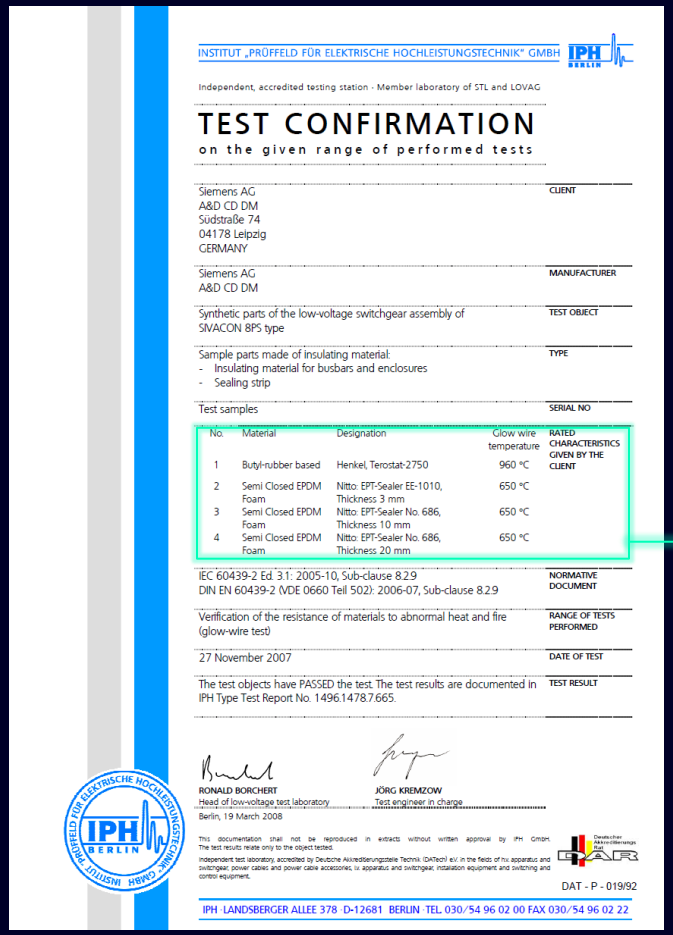
IEC 61439 @SIVACON S4
Verification of material and parts (10.2)

Glow wire test for used plastics



INSTITUT „PRÜFFELD FÜR ELEKTRISCHE HOCHLEISTUNGSTECHNIK" GMBH

Independent, accredited testing station - Member laboratory of STL and LOVAG

TEST CONFIRMATION
on the given range of performed tests

Siemens AG A&D CD DM Südstraße 74 04178 Leipzig GERMANY	CLIENT
Siemens AG A&D CD DM	MANUFACTURER
Synthetic parts of the low-voltage switchgear assembly of SIVACON 8PS type	TEST OBJECT
Sample parts made of insulating material: - Insulating material for busbars and enclosures - Sealing strip	TYPE
Test samples	SERIAL NO

No.	Material	Designation	Glow wire temperature	RATED CHARACTERISTICS GIVEN BY THE CLIENT
1	Butyl-rubber based	Henkel, Terostat-2750	960 °C	
2	Semi Closed EPDM Foam	Nitto: EPT-Sealer EE-1010, Thickness 3 mm	650 °C	
3	Semi Closed EPDM Foam	Nitto: EPT-Sealer No. 686, Thickness 10 mm	650 °C	
4	Semi Closed EPDM Foam	Nitto: EPT-Sealer No. 686, Thickness 20 mm	650 °C	

IEC 60439-2 Ed. 3.1: 2005-10, Sub-clause 8.2.9 DIN EN 60439-2 (VDE 0660 Teil 502): 2006-07, Sub-clause 8.2.9	NORMATIVE DOCUMENT
Verification of the resistance of materials to abnormal heat and fire (glow-wire test)	RANGE OF TESTS PERFORMED
27 November 2007	DATE OF TEST
The test objects have PASSED the test. The test results are documented in IPH Type Test Report No. 1496.1478.7.665.	TEST RESULT

RONALD BORCHERT
Head of low-voltage test laboratory

JÖRG KREMZOW
Test engineer in charge

Berlin, 19 March 2008

Independent test laboratory, accredited by Deutsche Akkreditierungsstelle Technik (DATech) e.V. in the fields of hv. apparatus and switchgear, power cables and power cable accessories, lv. apparatus and switchgear, installation equipment and switching and control equipment.

DAT - P - 019/92

IPH · LANDSBERGER ALLEE 378 · D-12681 · BERLIN · TEL. 030/54 96 02 00 FAX 030/54 96 02 22

- acc. IEC 60695-2-10:2013
- 960 °C for items fixing live parts
- 650 °C for all other items
- Not applicable on design parts

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IEC 61439 @SIVACON S4
Verification of material and parts (10.2)

Lifting

Article number	width in mm	weight in kg
8PQ3000-1BA03	1.200	1.300
8PQ3000-1BA02	1.000	1.350
8PQ3000-1BA01	800	1.400

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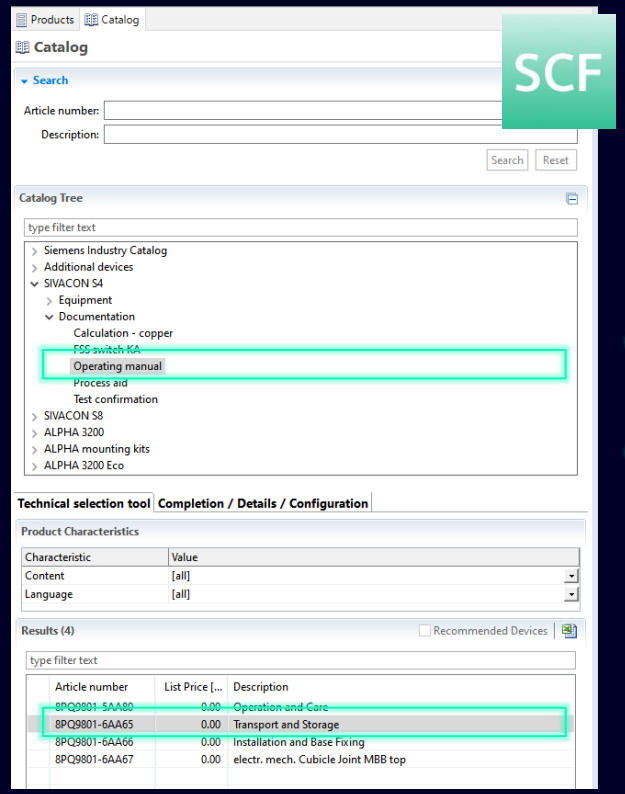
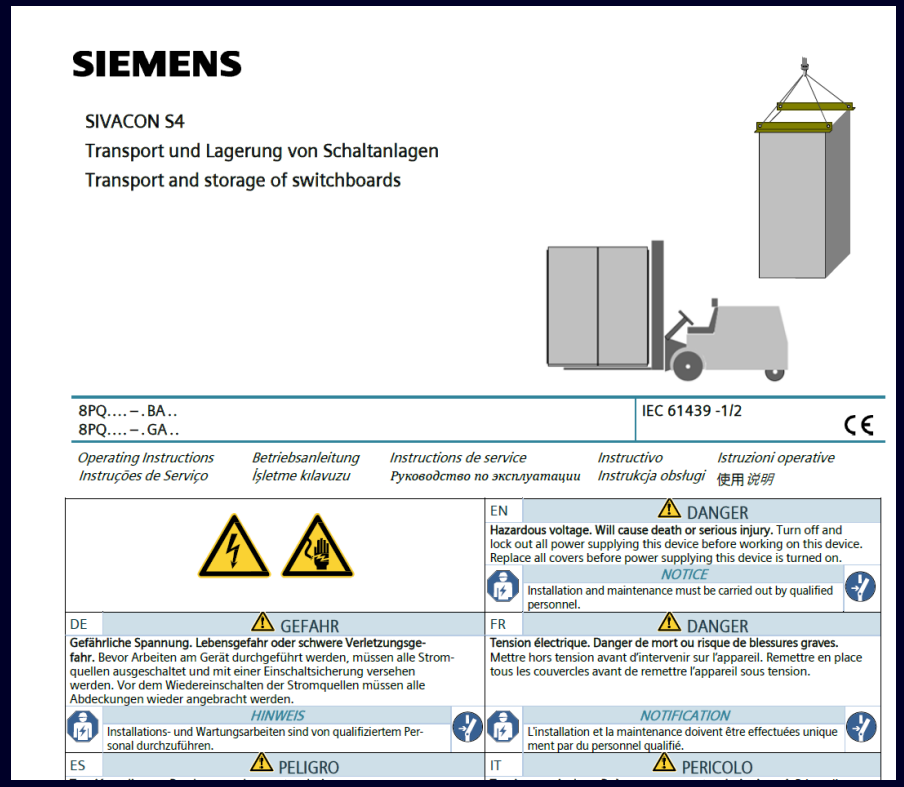
IEC 61439 @SIVACON S4
Verification of material and parts (10.2)

Lifting

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SIVACON S4
Transport und Lagerung von Schaltanlagen
Transport and storage of switchboards

8PQ....–.BA..
8PQ....–.GA..

IEC 61439 -1/2

Operating Instructions *Betriebsanleitung* *Instructions de service* *Instructivo* *Istruzioni operative*
Instruções de Serviço *İşletme kılavuzu* *Руководство по эксплуатации* *Instrukcja obsługi* *使用说明*

EN DANGER
Hazardous voltage. Will cause death or serious injury. Turn off and lock out all power supplying this device before working on this device. Replace all covers before power supplying this device is turned on.
NOTICE
Installation and maintenance must be carried out by qualified personnel.

DE GEFAHR
Gefährliche Spannung. Lebensgefahr oder schwere Verletzungsgefahr. Bevor Arbeiten am Gerät durchgeführt werden, müssen alle Stromquellen ausgeschaltet und mit einer Einschaltsicherung versehen werden. Vor dem Wiedereinschalten der Stromquellen müssen alle Abdeckungen wieder angebracht werden.
HINWEIS
Installations- und Wartungsarbeiten sind von qualifiziertem Personal durchzuführen.

FR DANGER
Tension électrique. Danger de mort ou risque de blessures graves. Mettre hors tension avant d'intervenir sur l'appareil. Remettre en place tous les couvercles avant de remettre l'appareil sous tension.
NOTIFICATION
L'installation et la maintenance doivent être effectuées uniquement par du personnel qualifié.

ES PELIGRO

IT PERICOLO

Part of “operating manual”
➔ “Transport and Storage”
8PQ9801-6AA65

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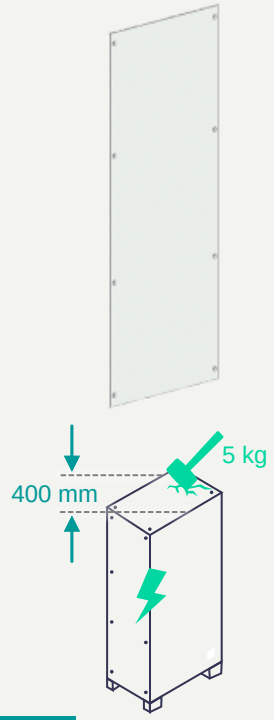
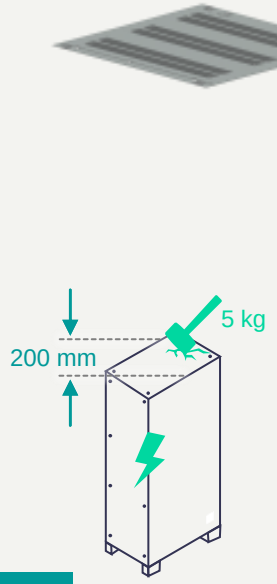
IEC 61439 @SIVACON S4
Verification of material and parts (10.2)

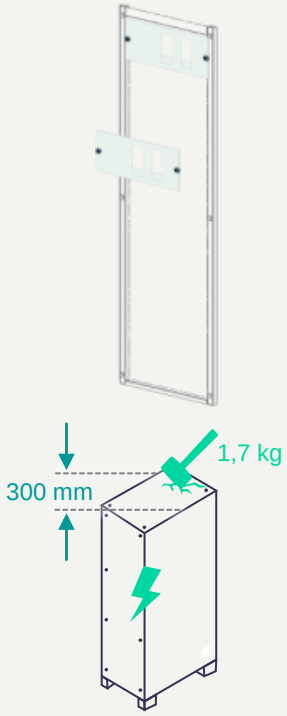
Mechanical impact



IK 10
Wk = 20 J



IK 09
Wk = 10 J



IK 08
Wk = 5 J

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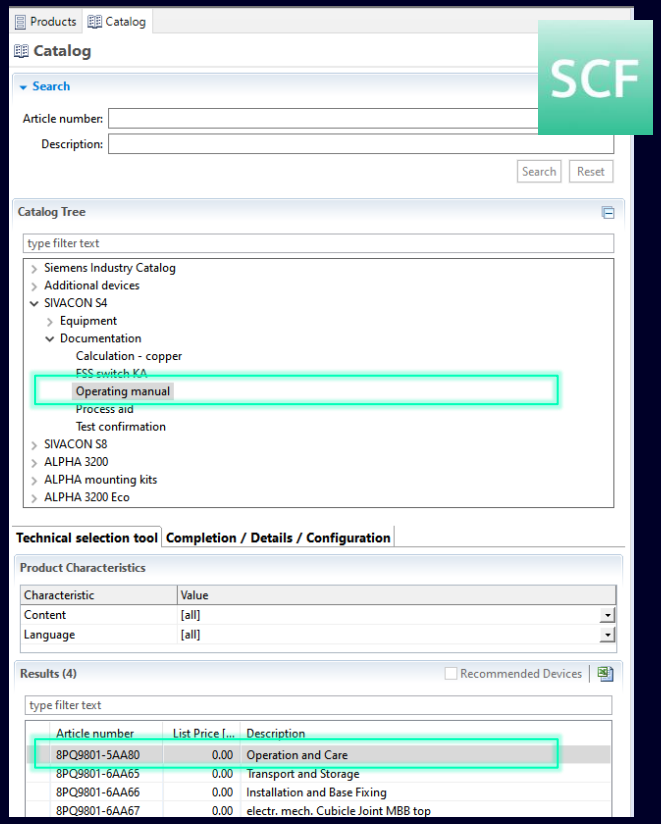
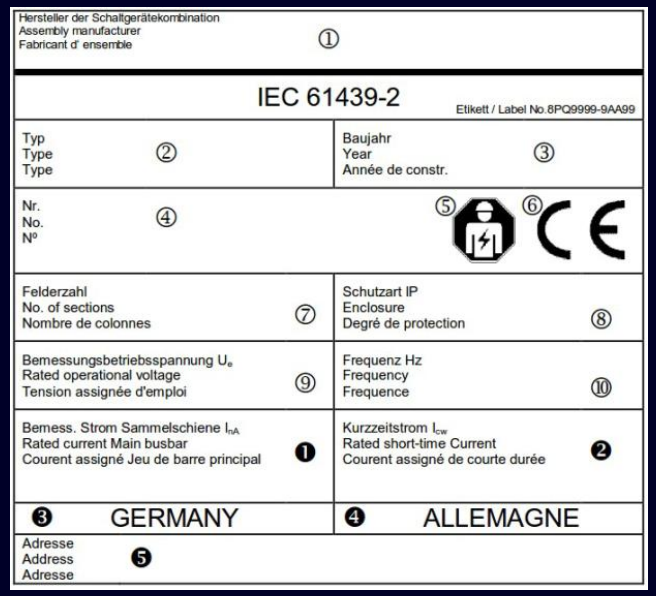
IEC 61439 @SIVACON S4
Verification of material and parts (10.2)

Marking





Template part of “Operation manual” ➔ “Operation and care”

8PQ9801-5AA80

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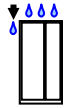
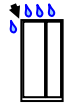
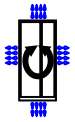
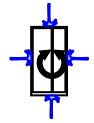
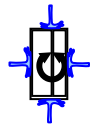
IEC 61439 @SIVACON S4
Degree of protection (10.3)

Code	Solid particles
1	50 mm
2	12 mm
3	2,5 mm
4	1,0 mm
5	Dust, no dangerous amount inside housing
6	No dust inside

Code	Liquid protection	
1	Dripping water	
2	Dripping water Tilted up to 15°	
3	Spraying water	
4	Splashing of water	
5	Water jets	
6	Powerful water jets	

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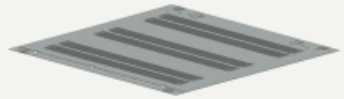
IEC 61439 @SIVACON S4
Degree of protection (10.3)

IP 40

Ventilated



IP x1

Extension

IP 55

Test Report TR 4600--234-003

If standard parts are not modified no further actions required

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IEC 61439 @SIVACON S4
Degree of protection (10.3)

In case of using devices with tested IP degree of protection under assembled conditions

IP degree is **higher** or **equal** to SIVACON S4

- Follow up instructions given by device supplier

IP degree of protection is **lower** than SIVACON S4

- IP degree of the system in total is reduced to device level

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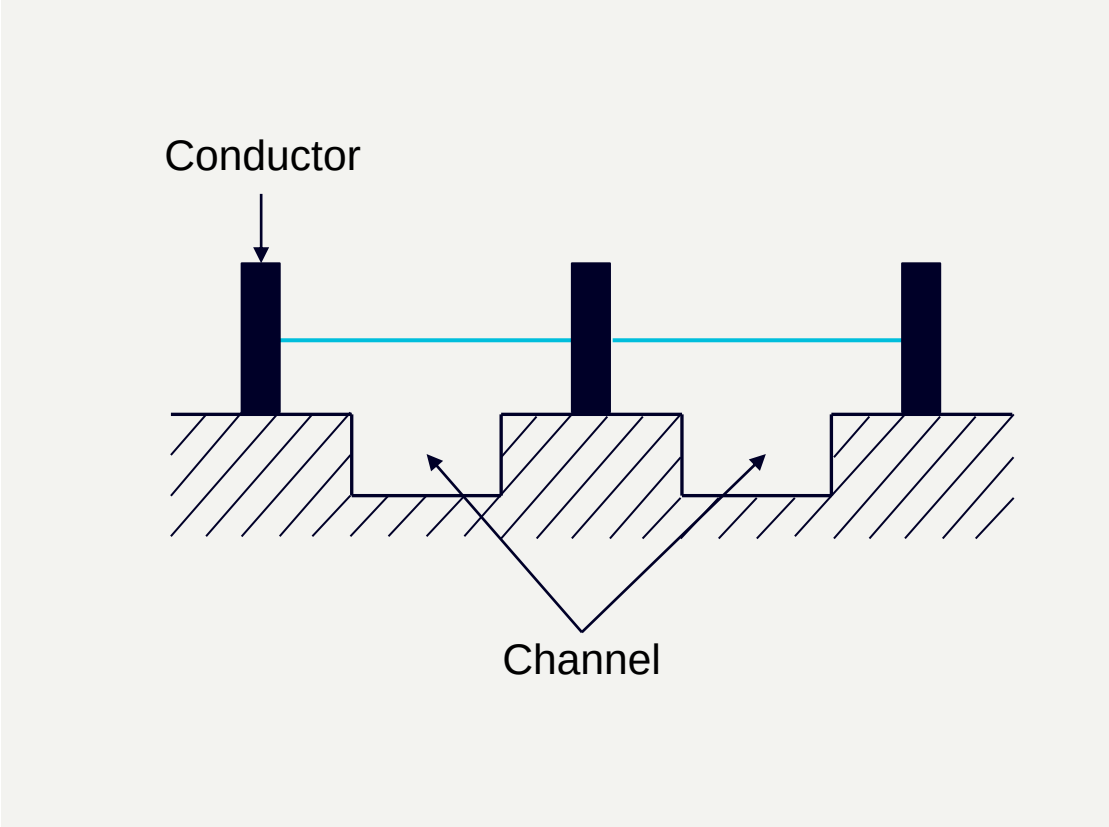
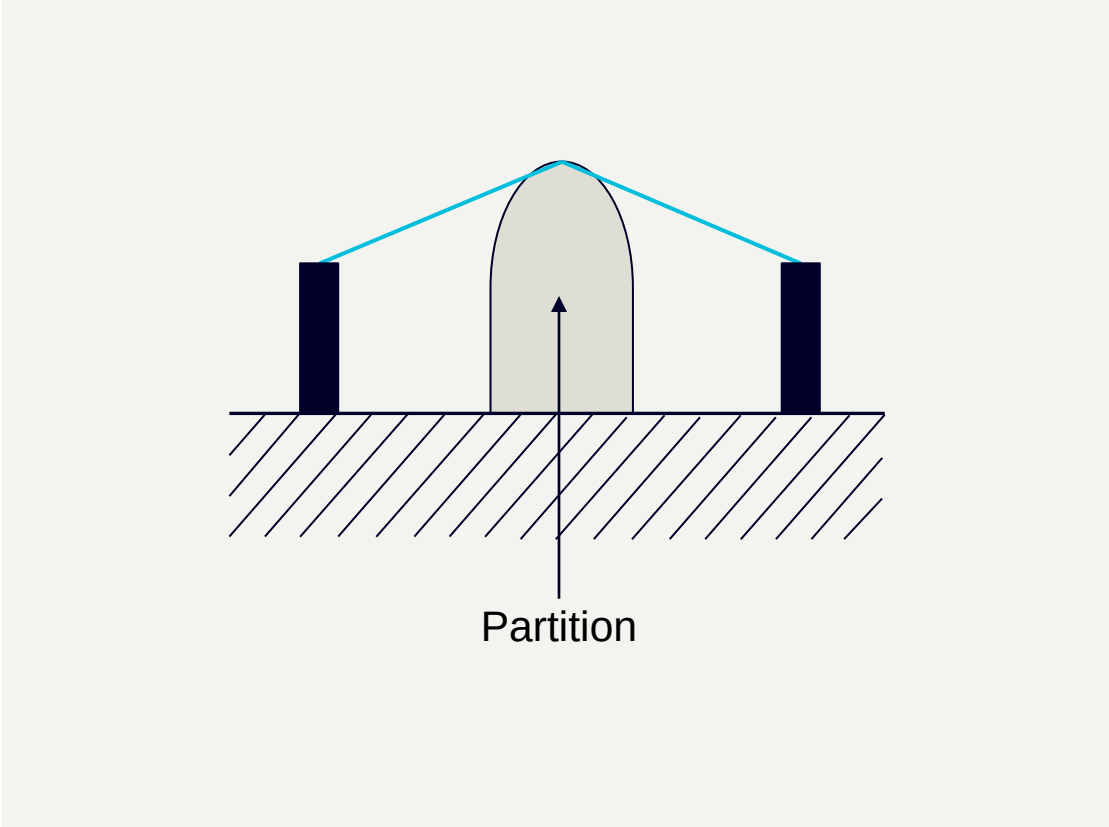
IEC 61439 @SIVACON S4
Clearances and creep distances (10.4)

Clearances: Shortest distance between two conductors





= Clearances

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IEC 61439 @SIVACON S4
Clearances and creep distances (10.4)

Table 1 – Minimum clearances in aira (8.3.2)

Rated impulse withstand voltage U_{imp} kV	Minimum clearance mm
≤ 2,5	1,5
4,0	3,0
6,0	5,5
8,0	8,0
12,0	14,0

SIVACON S4

Based on inhomogeneous field conditions and pollution degree 3.

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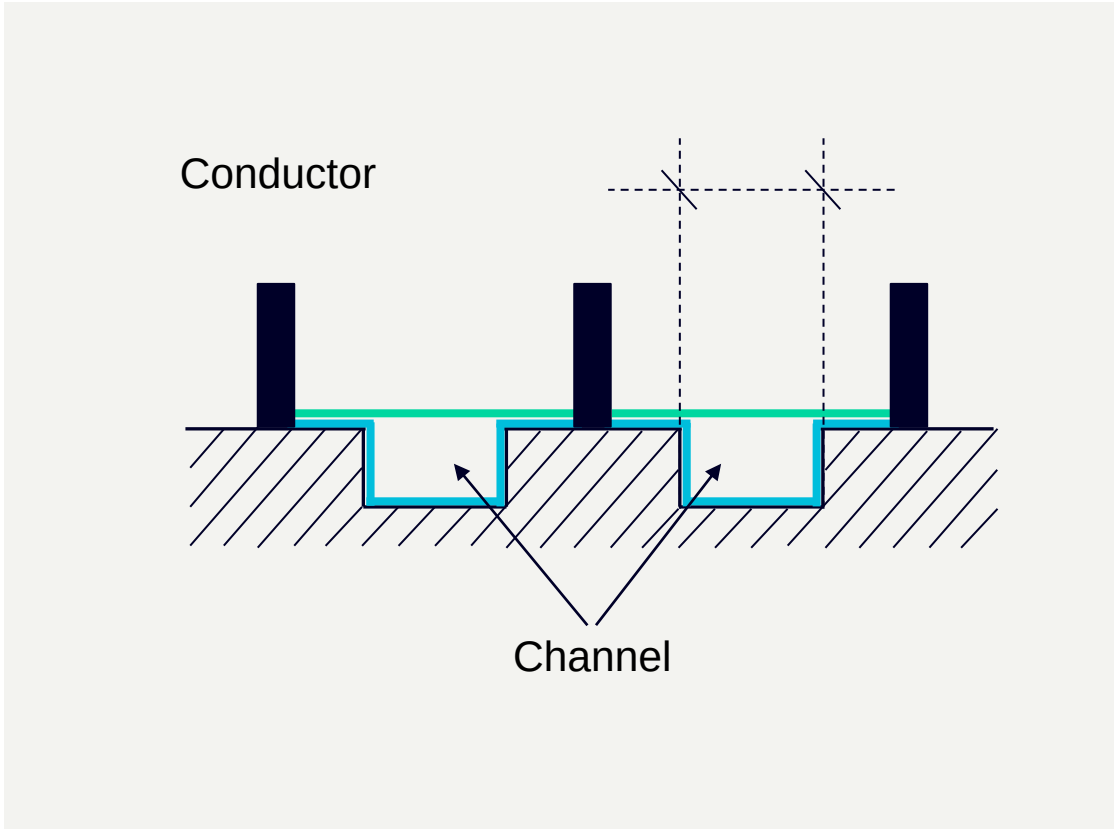
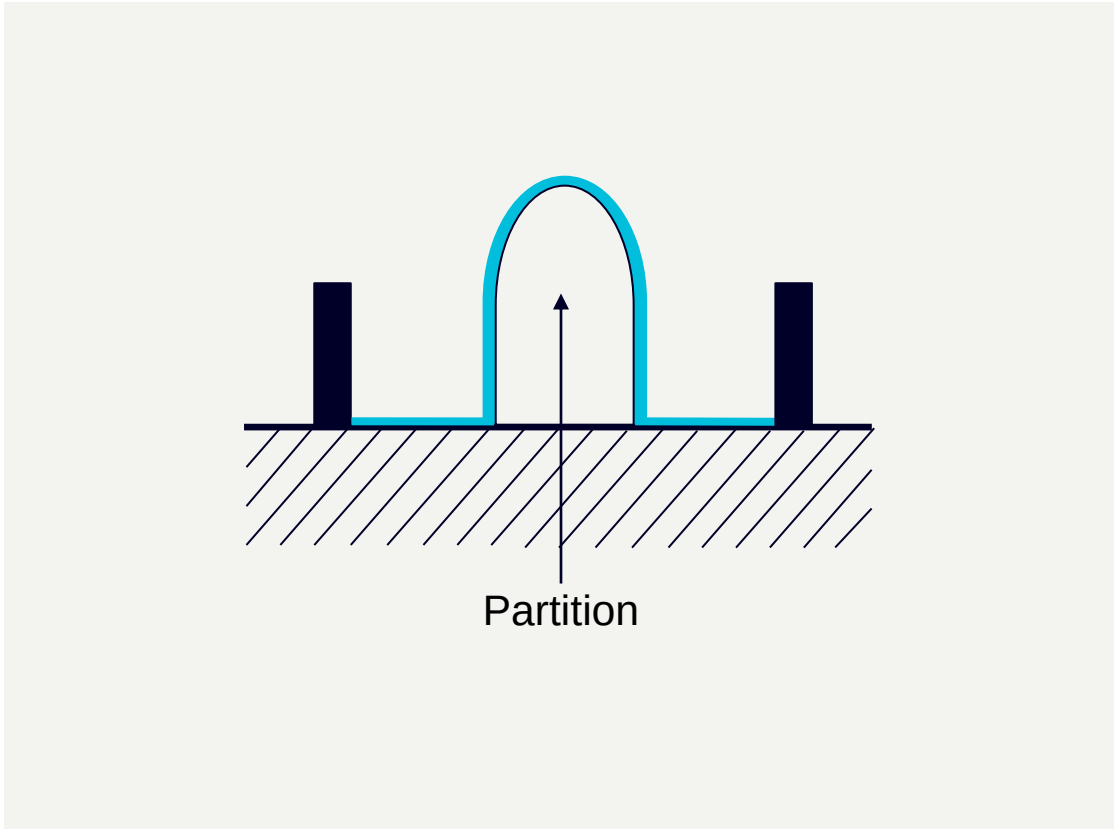
IEC 61439 @SIVACON S4
Clearances and creep distances (10.4)

Creep distance: Shortest distance along surface between two conductors





= Clearances

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IEC 61439 @SIVACON S4
Clearances and creep distances (10.4)

Rated insulation voltage U_i	Minimum creepage distance mm							
	Pollution degree							
	1	2			3			
	Material group[c]	Material group[c]			Material group[c]			
V[b]	All material groups	I	II	IIIa and IIIb	I	II	IIIa	IIIb
32	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
40	1,5	1,5	1,5	1,5	1,5	1,6	1,8	1,8
50	1,5	1,5	1,5	1,5	1,5	1,7	1,9	1,9
63	1,5	1,5	1,5	1,5	1,6	1,8	2	2
80	1,5	1,5	1,5	1,5	1,7	1,9	2,1	2,1
100	1,5	1,5	1,5	1,5	1,8	2	2,2	2,2
125	1,5	1,5	1,5	1,5	1,9	2,1	2,4	2,4
160	1,5	1,5	1,5	1,6	2	2,2	2,5	2,5
200	1,5	1,5	1,5	2	2,5	2,8	3,2	3,2
250	1,5	1,5	1,8	2,5	3,2	3,6	4	4
320	1,5	1,6	2,2	3,2	4	4,5	5	5
400	1,5	2	2,8	4	5	5,6	6,3	6,3
500	1,5	2,5	3,6	5	6,3	7,1	8,0	8,0
630	1,8	3,2	4,5	6,3	8	9	10	10
800	2,4	4	5,6	8	10	11	12,5	a
1 000	3,2	5	7,1	10	12,5	14	16	
1 250	4,2	6,3	9	12,5	16	18	20	
1 600	5,6	8	11	16	20	22	25	

pollution degree	3
overvoltage category	III (distribution circuit level)
rated insulation voltage U_i	1000 V
rated impulse withstand voltage U_{imp}	8 kV
minimum clearance (case A, inhomogeneous field)	8,0 mm
comparative tracking index	400 ≤ CTI ≥ 600
material group	II
minimum creepage distance	14,0 mm

✓ Done by Siemens

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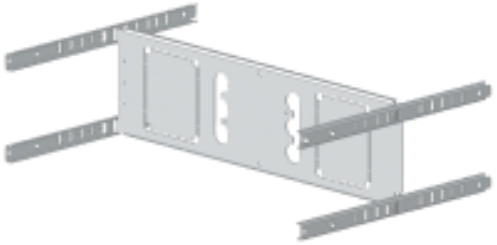
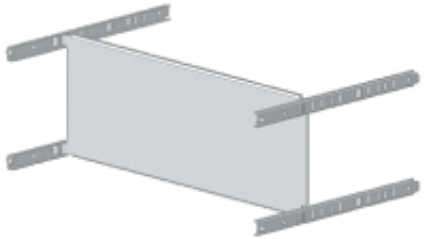
IEC 61439 @SIVACON S4
Clearances and creep distances (10.4)

Assembly kits are already designed according this design rule



For mounting plate installations design rules need to be respected

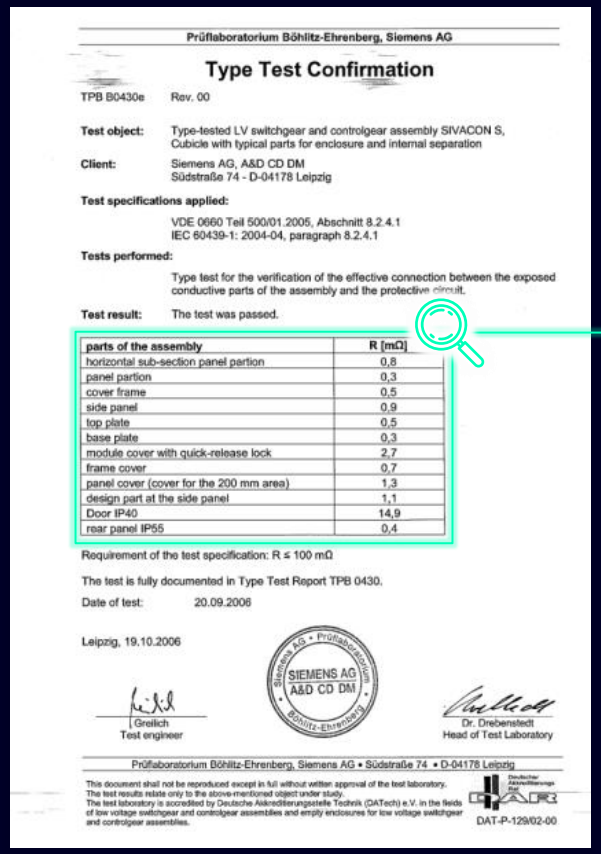


✓ For Siemens assembly kits

SIEMENS

IEC 61439 @SIVACON S4
Effective earth continuity … (10.5)

10.5 Effective earth continuity between the exposed conductive parts of the assembly and the protective circuit



Prüflaboratorium Böhlitz-Ehrenberg, Siemens AG

Type Test Confirmation

TPB B0430e Rev. 00

Test object: Type-tested LV switchgear and controlgear assembly SIVACON S, Cubicle with typical parts for enclosure and internal separation

Client: Siemens AG, A&D CD DM
Südstraße 74 - D-04178 Leipzig

Test specifications applied:
VDE 0660 Teil 500/01.2005, Abschnitt 8.2.4.1
IEC 60439-1: 2004-04, paragraph 8.2.4.1

Tests performed:
Type test for the verification of the effective connection between the exposed conductive parts of the assembly and the protective circuit.

Test result: The test was passed.

parts of the assembly	R [mΩ]
horizontal sub-section panel partion	0,8
panel partion	0,3
cover frame	0,5
side panel	0,9
top plate	0,5
base plate	0,3
module cover with quick-release lock	2,7
frame cover	0,7
panel cover (cover for the 200 mm area)	1,3
design part at the side panel	1,1
Door IP40	14,9
rear panel IP55	0,4

Requirement of the test specification: R ≤ 100 mΩ

The test is fully documented in Type Test Report TPB 0430.

Date of test: 20.09.2006

Leipzig, 19.10.2006

Greilich
Test engineer

SIEMENS AG A&D CD DM

Dr. Drebenstedt
Head of Test Laboratory

Prüflaboratorium Böhlitz-Ehrenberg, Siemens AG • Südstraße 74 • D-04178 Leipzig

This document shall not be reproduced except in full without written approval of the test laboratory. The test results relate only to the above-mentioned object under study. The test laboratory is accredited by Deutsche Akkreditierungsstelle Technik (DATech) e.V. in the fields of low voltage switchgear and controlgear assemblies and empty enclosures for low voltage switchgear and controlgear assemblies.

DAT-P-129/02-00

parts of the assembly	R [mΩ]
horizontal sub-section panel partion	0,8
panel partion	0,3
cover frame	0,5
side panel	0,9
top plate	0,5
base plate	0,3
module cover with quick-release lock	2,7
frame cover	0,7
panel cover (cover for the 200 mm area)	1,3
design part at the side panel	1,1
Door IP40	14,9
rear panel IP55	0,4

Requirement of the test specification: R ≤ 100 mΩ

Protection class I

- measuring current: 10 A
- not > 0,1 Ω

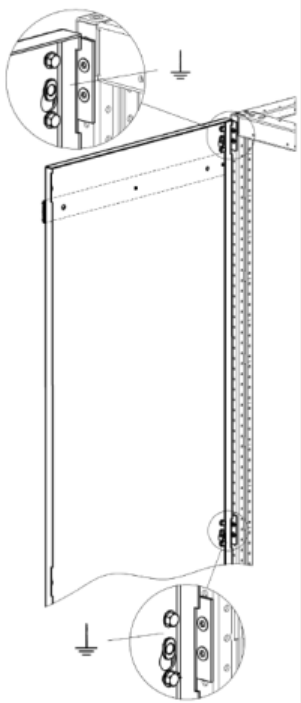
Done by Siemens

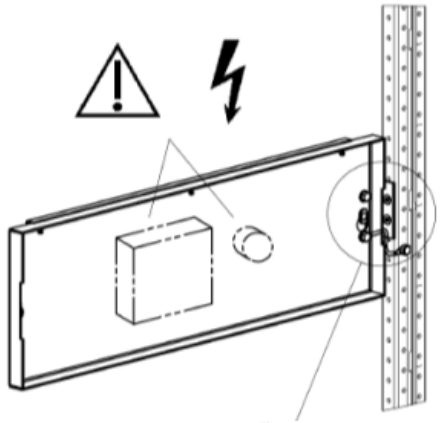
SIEMENS

IEC 61439 @SIVACON S4
Effective earth continuity … (10.5)

10.5 Effective earth continuity between the exposed conductive parts of the assembly and the protective circuit

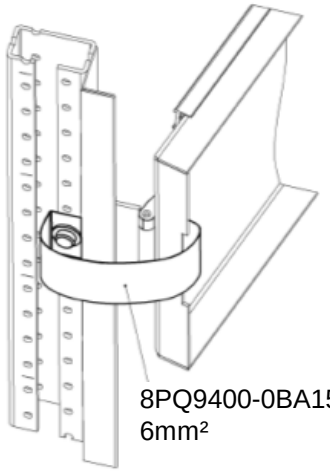
For door assemblies





Bemessungsbetriebsstrom I_e A	Mindestquerschnitt für Schutzleiter mm²
$I_e \leq 20$	S [a]
$20 < I_e \leq 25$	2,5
$25 < I_e \leq 32$	4
$32 < I_e \leq 63$	6
$63 < I_e$	10

[a] S ist der Querschnitt des Außenleiters (mm²).



8PQ9400-0BA15
6mm²

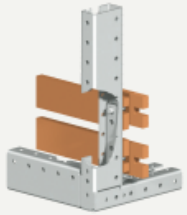
Done by Siemens

SIEMENS

IEC 61439 @SIVACON S4
Effective earth continuity … (10.5)

10.5 Effective earth continuity between the exposed conductive parts of the assembly and the protective circuit

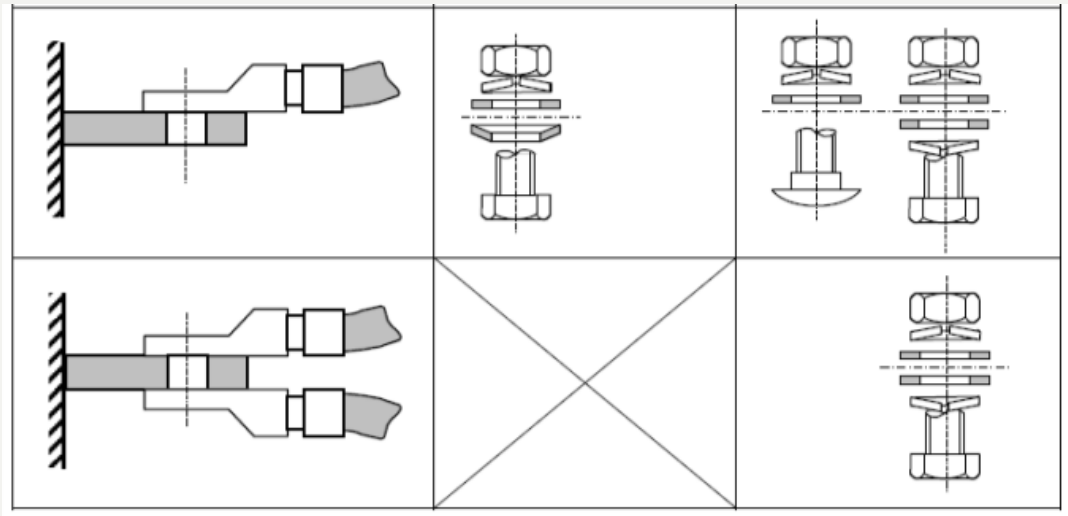
For connection to split PE busbars



Connection clamp

Screw connection

With spring washer according to DIN 6796



✓ Done by Siemens

SIEMENS

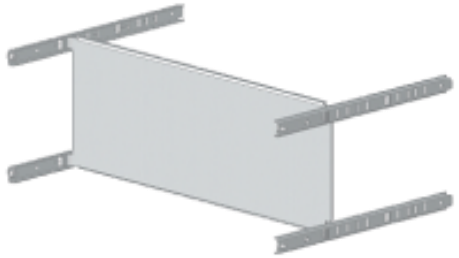
IEC 61439 @SIVACON S4
Incorporation of switching devices and components (10.6)

For SIVACON assembly kits

- Already prepared for a specific device
- Using device accessories (e. g. clamping covers) defined within device manual

For mounting plate installations

- Follow up installing and mounting instructions given by the device manufacturer

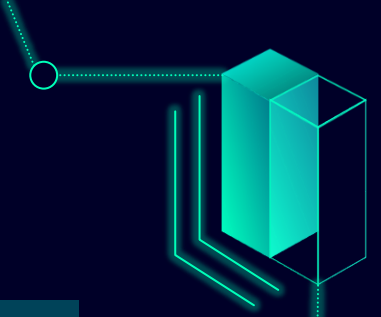


✓ For Siemens assembly kits

SIEMENS

IEC 61439 @SIVACON S4

Internal electric circuits and connections (10.7)



1 Follow up fixed construction rules

2 Conductor material

- Copper
- Cross section
- Marking
- Mechanical strength

3 Cable entrance

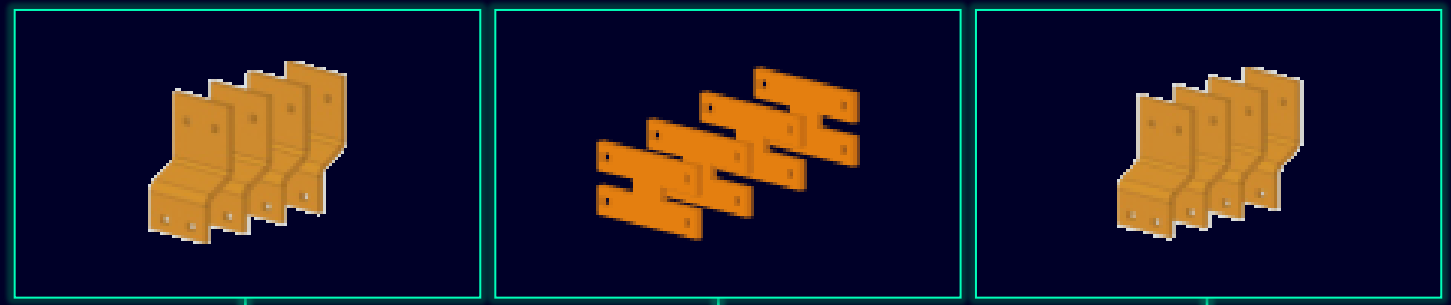
- IP degree of protection

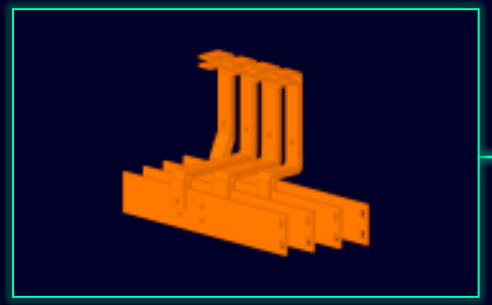
4 Connection points

SIEMENS

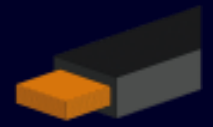
IEC 61439 @SIVACON S4

Internal electric circuits and connections (10.7)





Using type tested material according to IEC 61439

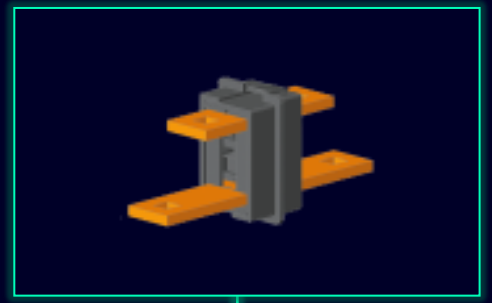


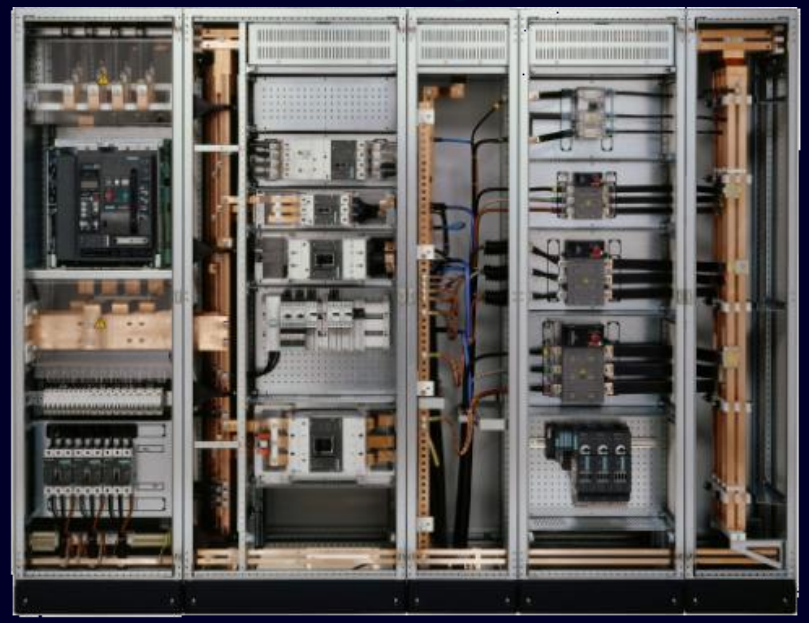
Copper drawings available through SIMARIS configuration

Done by Siemens

SIEMENS

IEC 61439 @SIVACON S4
Terminals for external conductors (10.8)





Device accessories

Done by Siemens

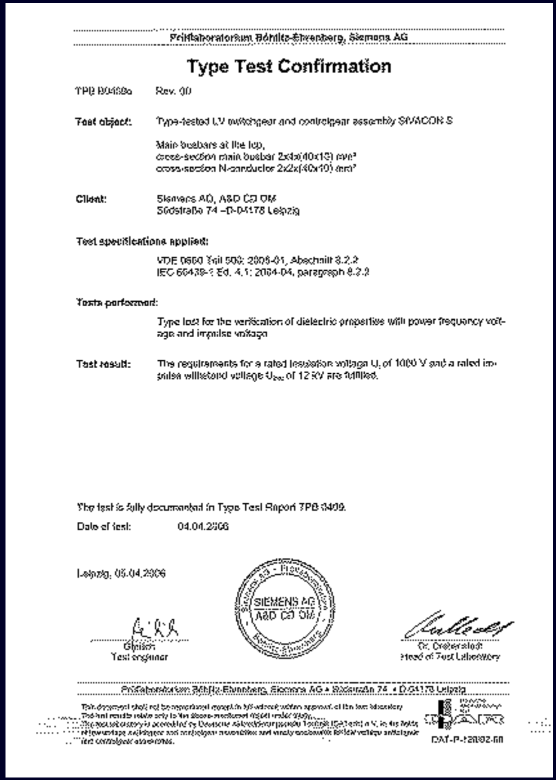
SIEMENS

IEC 61439 @SIVACON S4

Dielectric properties (10.9)

10.9.1 power frequency voltage

10.9.2 impulse voltage



Prüflaboratorium Böhlitz-Ehrenberg, Siemens AG

Type Test Confirmation

TPB 90409a Rev. 00

Test object: Type-tested LV switchgear and controlgear assembly SIVACON S

Main busbars at the top,
cross-section main busbar 2x4x(40x10) mm²
cross-section N-conductor 2x2x(40x10) mm²

Client: Siemens AG, A&D CD DM
Südstraße 74 –D-04178 Leipzig

Test specifications applied:

VDE 0660 Teil 500: 2005-01, Abschnitt 8.2.2
IEC 60439-1 Ed. 4.1: 2004-04, paragraph 8.2.2

Tests performed:

Type test for the verification of dielectric properties with power frequency voltage and impulse voltage

Test result: The requirements for a rated insulation voltage U_i of 1000 V and a rated impulse withstand voltage U_{imp} of 12 kV are fulfilled.

The test is fully documented in Type Test Report TPB 0409.

Date of test: 04.04.2006

Leipzig, 05.04.2006

SIEMENS AG A&D CD DM

Gleisch
Test engineer

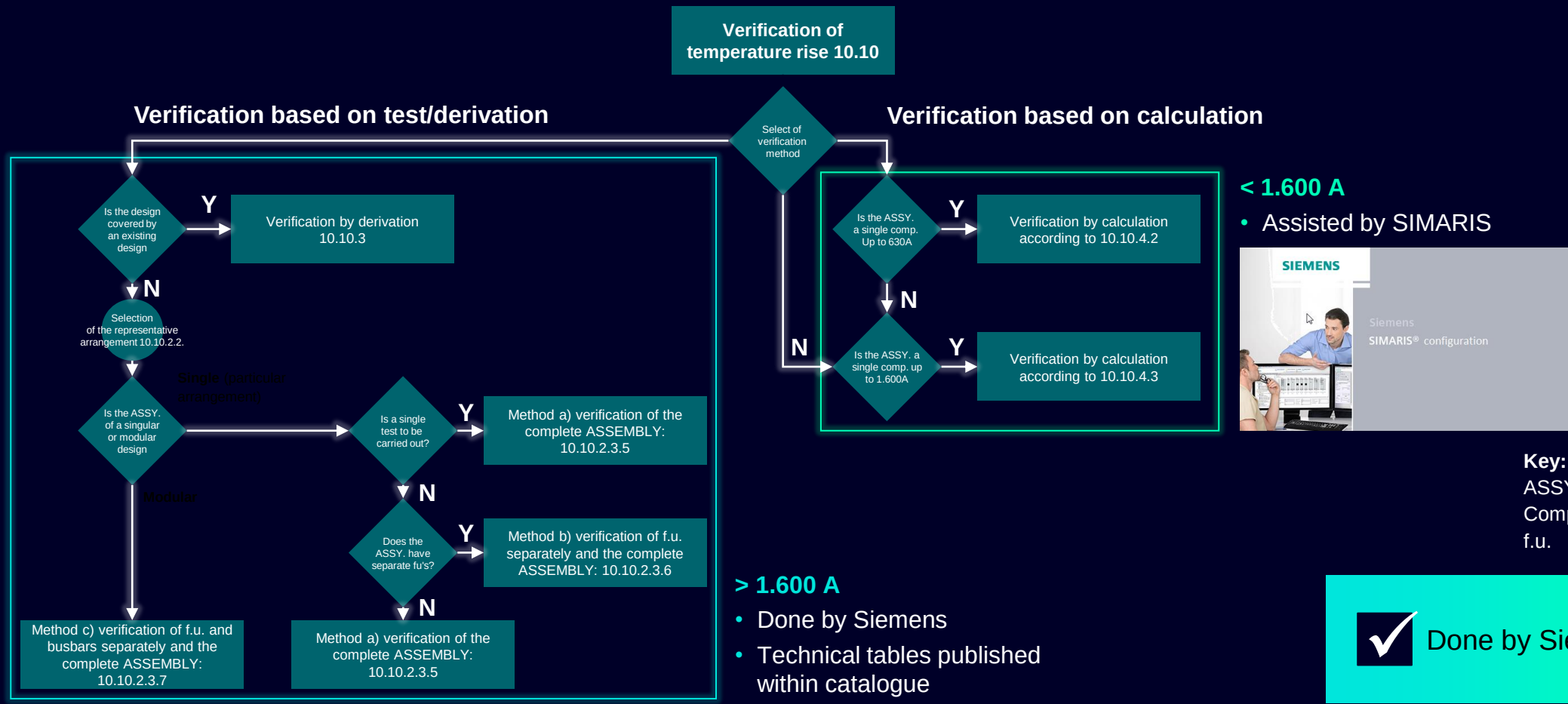
Dr. Drebenstedt
Head of Test Laboratory

Prüflaboratorium Böhlitz-Ehrenberg, Siemens AG • Südstraße 74 • D-04178 Leipzig

DAT-P-128/02-00

SIEMENS

IEC 61439 @SIVACON S4
Verification of temperature rise (10.10)



< 1.600 A

- Assisted by SIMARIS

> 1.600 A

- Done by Siemens
- Technical tables published within catalogue

Key:

ASSY.	ASSEMBLY
Comp.	compartment
f.u.	functional unit

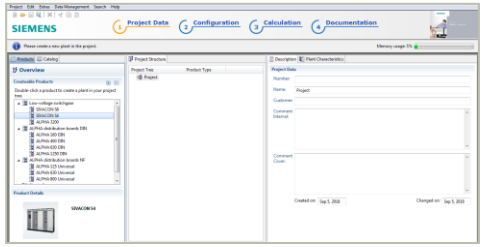
Done by Siemens

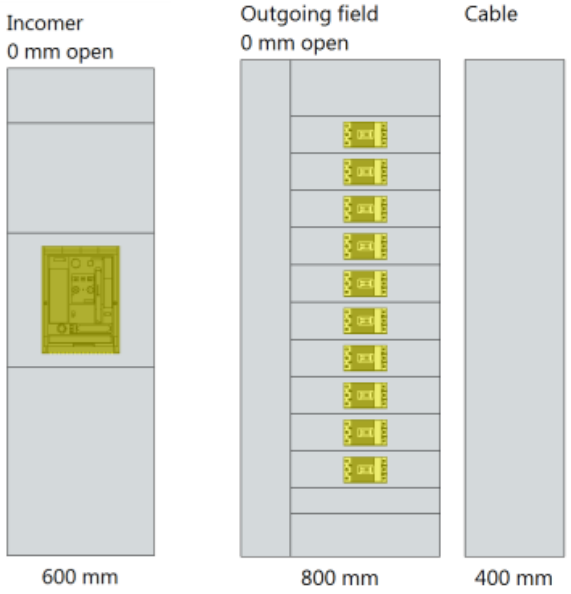
Source: IEC 61439-1 - Figure 0.1 – Temperature rise verification

SIEMENS

IEC 61439 @SIVACON S4
Verification of temperature rise (10.10)

- SIMARIS is equipped with an integrated power loss calculation
- Standard set up is according to IEC 61439-2
- User has to compare with real ambient conditions
- Integrated power loss database reduces efforts to a minimum
- Excel documentation offers the great flexibility in creating customized reports





Power loss calculation

Emitable power loss [W]	**589.1**
Power loss busbar system [W]	261
Power loss feeders [W]	102.4
Power loss addition [W]	5.1

➔ RDF = 80 %

✓ Done by Siemens

SIEMENS

IEC 61439 @SIVACON S4
Short-circuit withstand strength (10.11)

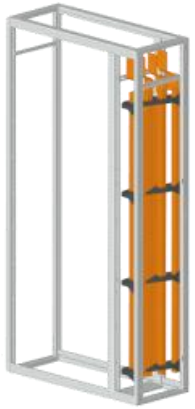
Main busbar systems

- Tested by Siemens

Follow up instruction rules

- Number of reinforcements are published within catalogue
- SIMARIS configuration gives you the right quantity as well
- Additional it's published within mounting instructions

Busbar size		Section width	Number of reinforcements as a function of I_{pk}, I_{cw}		
Number of bars per phase	Dimensions		I_{cw} = 25 kA I_{pk} = 52.5 kA	I_{cw} = 35 kA I_{pk} = 73.5 kA	I_{cw} = 50 kA I_{pk} = 105 kA
	mm	mm			
2 	20 × 10	350	0	0	--
		400	0	0	
		600	0	0	
		800	1	1	
		850	1	1	
		1000	1	1	
		1200	2	2	
	30 × 10	350	--	0	0
		400		0	0
		600		0	1
		800		1	1
		850		1	1
		1000		1	2
		1200		2	2



✓ Done by Siemens

SIEMENS

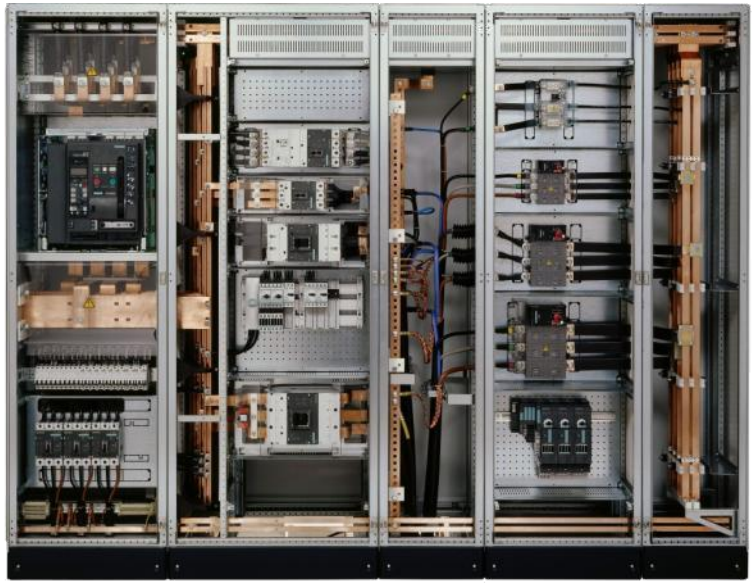
IEC 61439 @SIVACON S4
Short-circuit withstand strength (10.11)

Device installation

- Tested for SIVACON assembly kits

Follow up instruction rules

- Follow up mounting instructions and manual



TEST CONFIRMATION

on the given range of performed tests

Done by Siemens

SIEMENS

IEC 61439 @SIVACON S4
Electromagnetic compatibility (10.12)

- **Installed devices must be designed and verified according to environmental conditions.**
- **Installation according to instructions given by manufacturer**

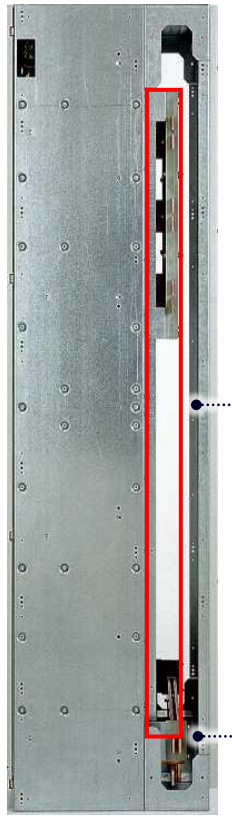
Not applicable

SIEMENS

IEC 61439 @SIVACON S4
Electromagnetic compatibility (10.12)

Technical background

- Graphic shows a switchboard design, which is not EMC friendly

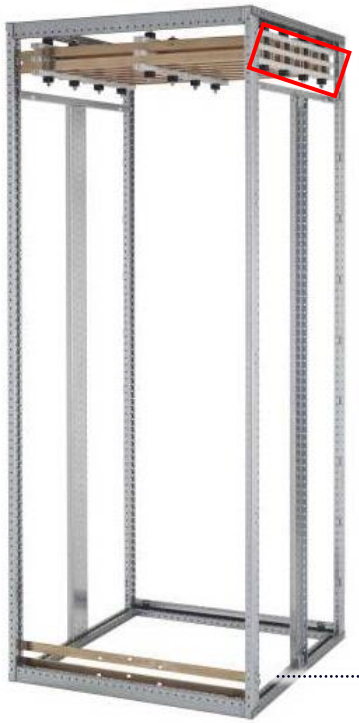


Measures to decrease effect

- Reduce spacing between N and the main phases
- Move N and PE conductors apart

SIEMENS

IEC 61439 @SIVACON S4
Electromagnetic compatibility (10.12)



- L1 – L3 and N phase are closed together, which reducing the magnetic effects to a minimum
- PE bar is far away from main phases. No magnetic induction.

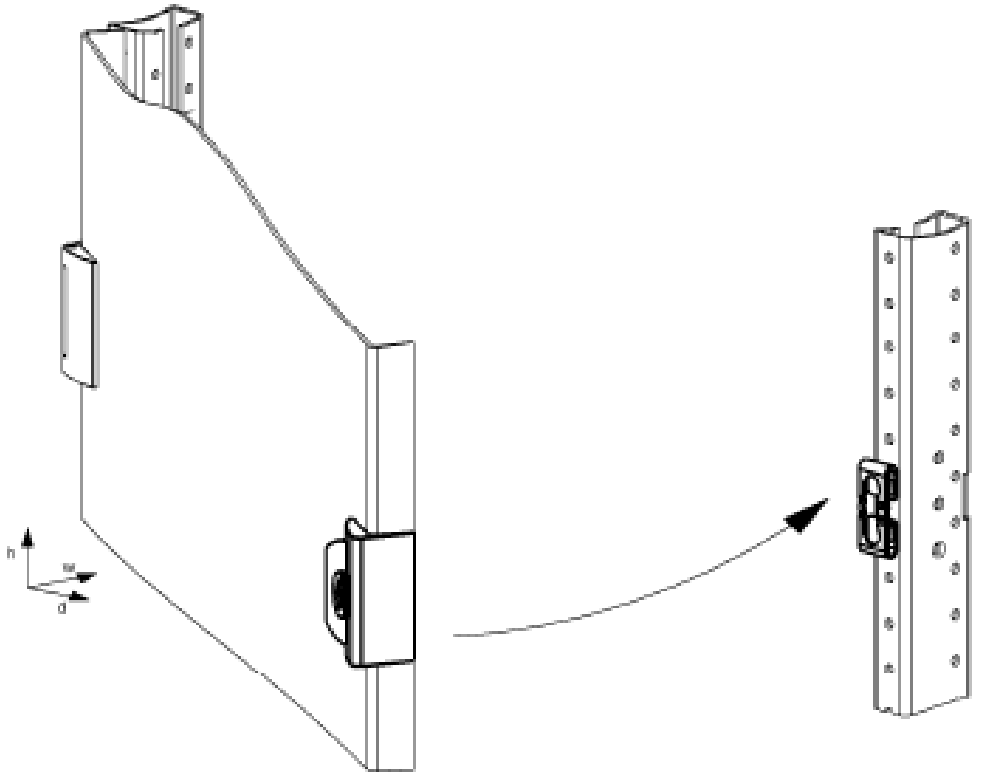
✓ EMC friendly design

SIEMENS

IEC 61439 @SIVACON S4
Mechanical operation (10.13)

Test requirement

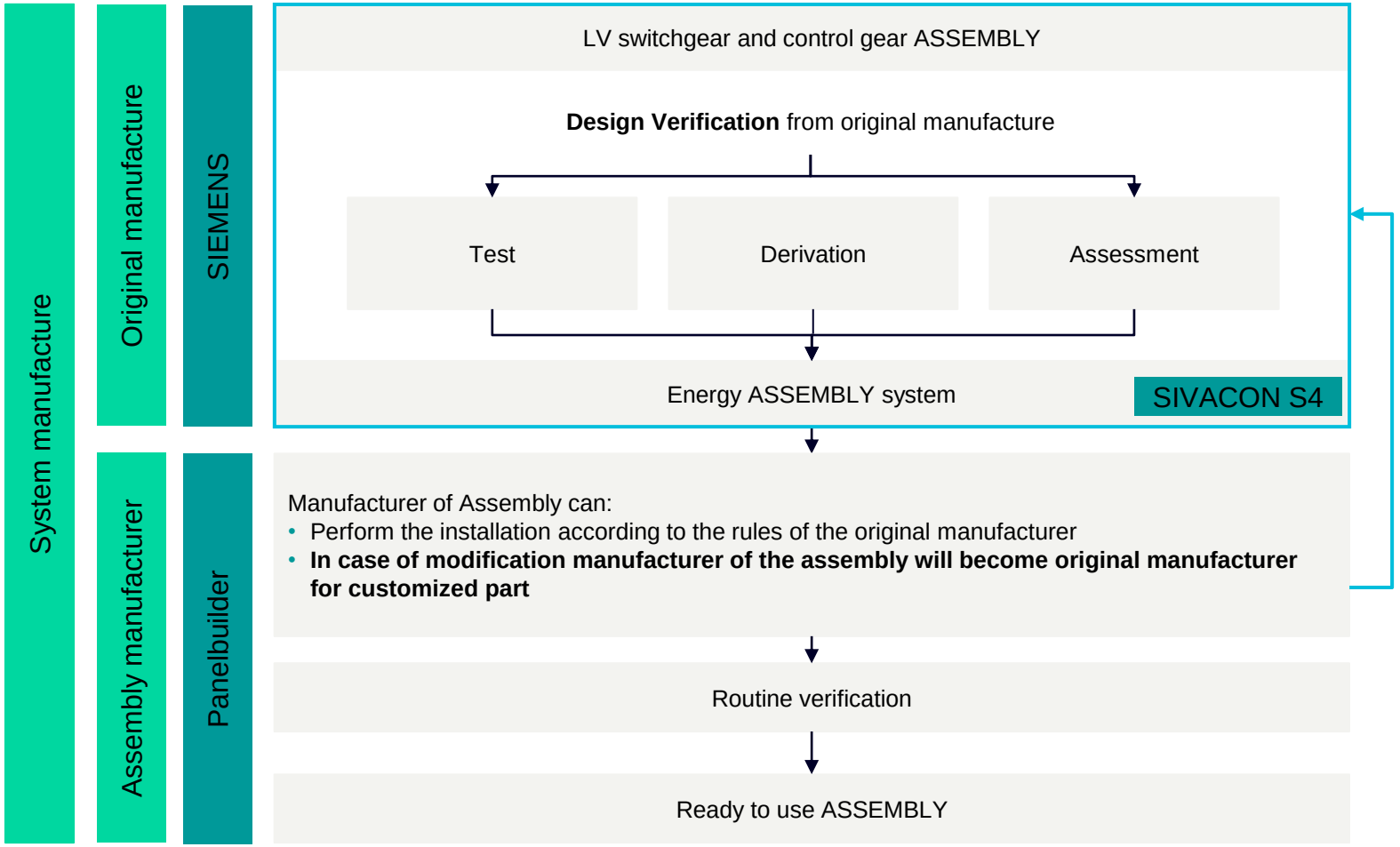
- All movable parts need to be checked 200 times
- Approved on Siemens side



✓ Done by Siemens

SIEMENS

IEC 61439 @SIVACON S4
Customizing



- When modification affect one of these 12 tests
- Assembly manufacturer is original manufacturer for customized area

SIEMENS

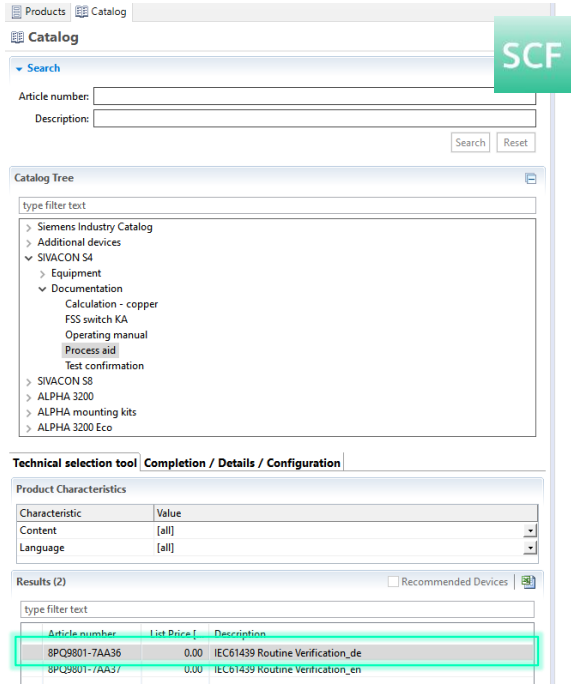
IEC 61439 @SIVACON S4
Routine verification

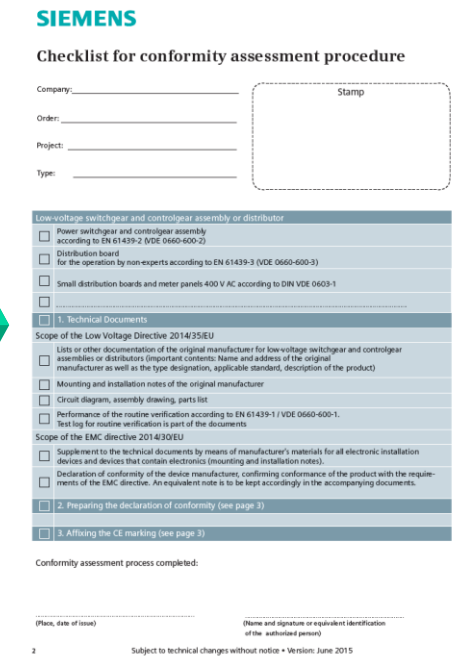
Checking constructional requirements

- Degree of protection
- Clearances and creepage distance
- Protection against electric shock and integrity of protective circuits
- internal circuits and connections
- terminals for external conductions
- mechanical function

Checking performance

- Dielectric properties
- Wiring, operating performance and function



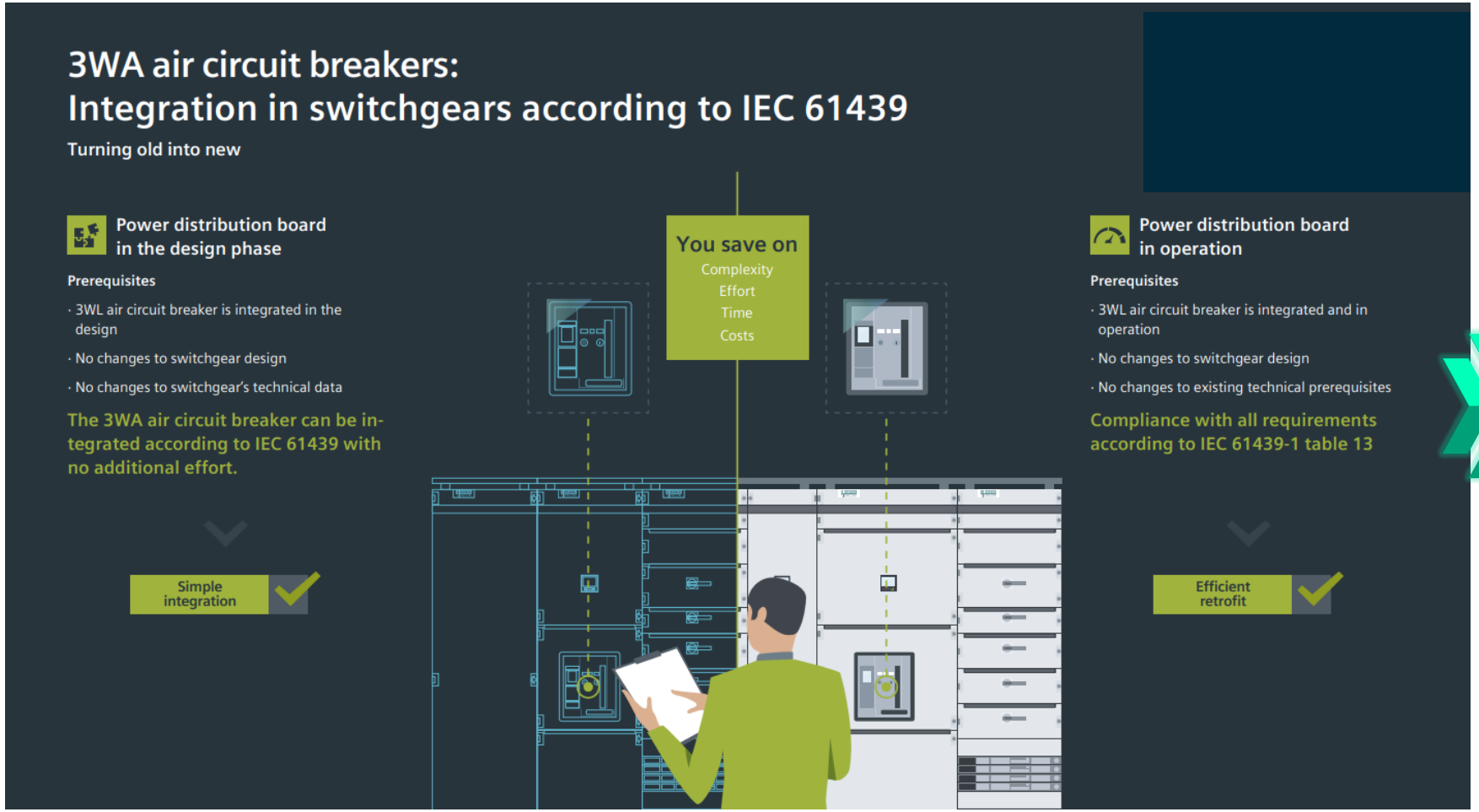


Follow up our step by step check list!

✓ Prepared by Siemens

SIEMENS

Summary
Additional information relating to 3WA Retrofit

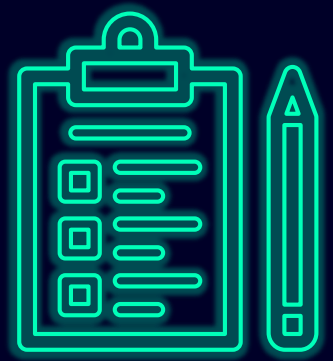


3WA Integration and retrofit into switchboards according to IEC 61439

(Whitepaper)

SIEMENS

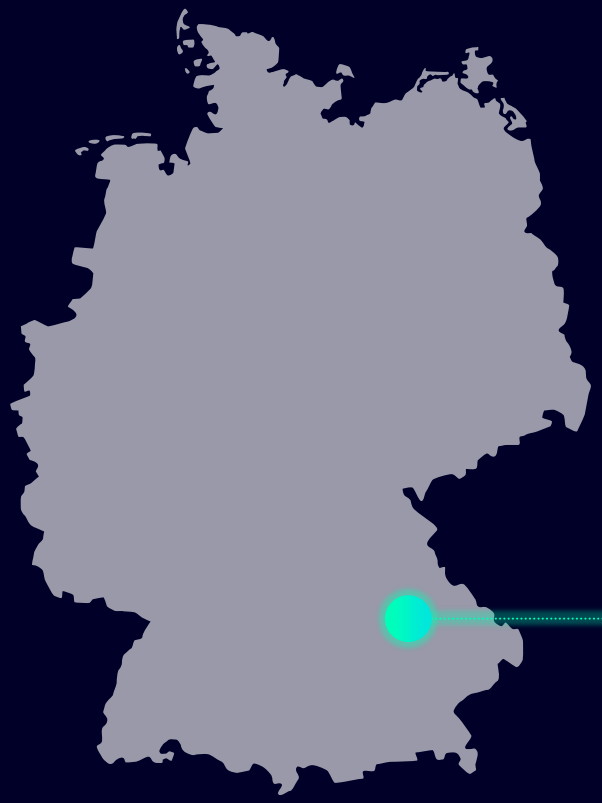
Additional tests



SIEMENS

Additional tests
ISO 9001

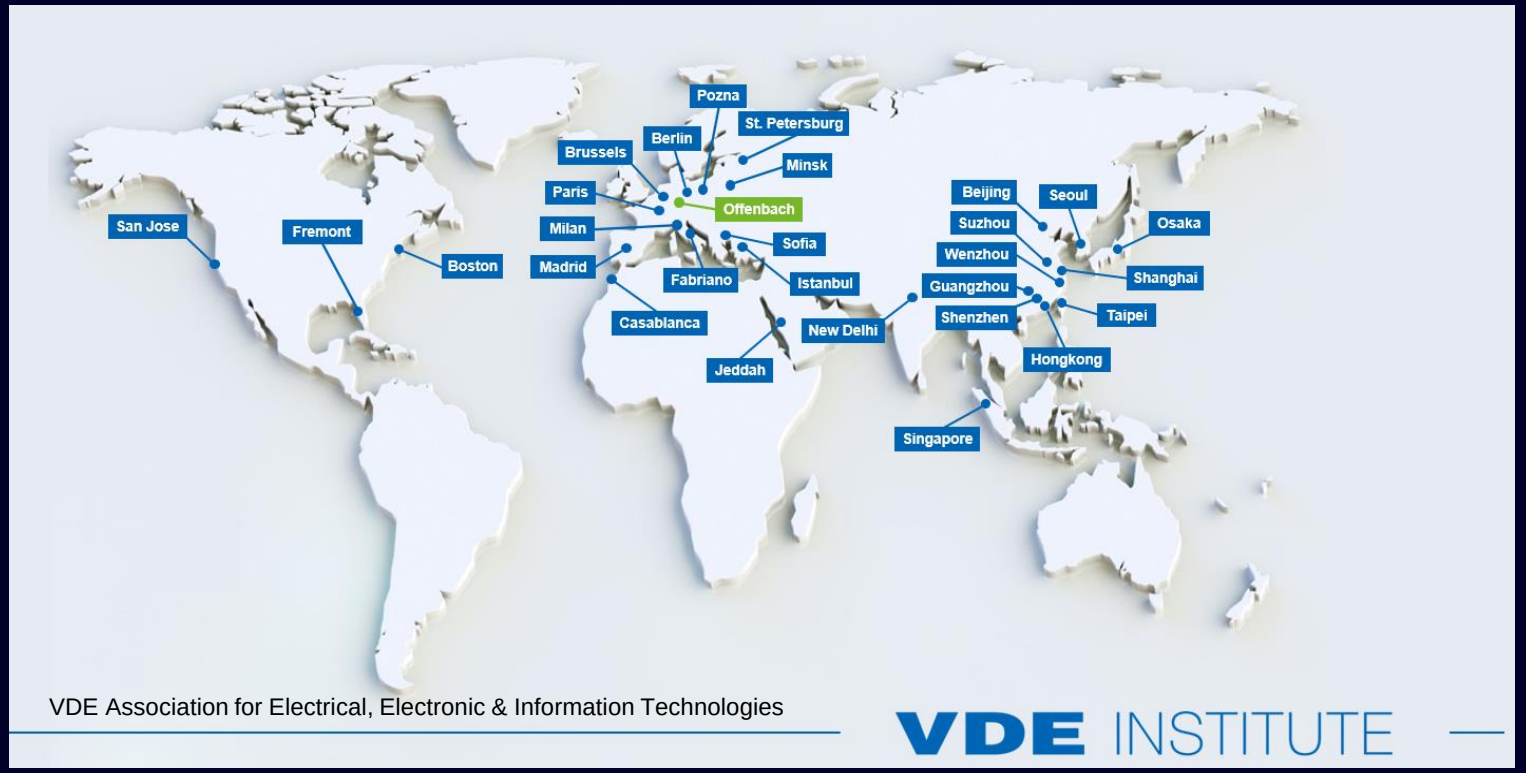
Quality standard fulfilled by our factory



ISO 9001

ALPHA
Verteilertechnik GmbH
Ringstr. 60
93413 Cham-Altenmarkt
Germany

Additional tests
3rd party approbation with VDE



Whole system was rechecked by external and independent organization.

SIEMENS

Additional tests
3rd party approbation with VDE

1

Siemens tests in its own laboratories **according to IEC standards** and thus offers sufficient

2

The **VDE tests the measuring instruments** used by Siemens for heating and insulation testing for accuracy and function.

3

External laboratories **selected by VDE** carry out further independent and neutral tests

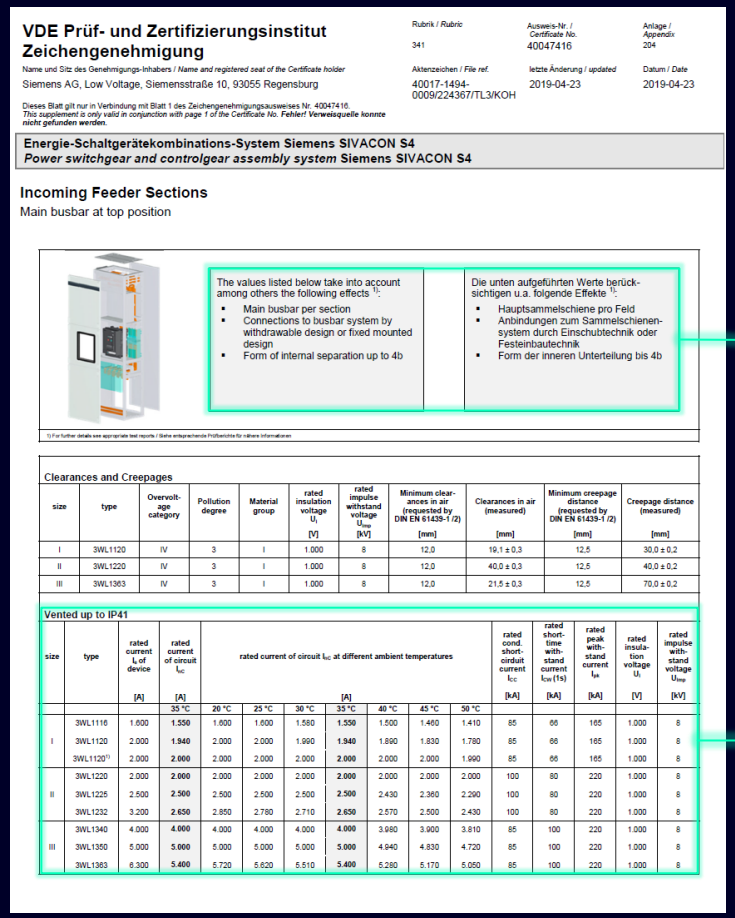
4

Cross-checking: VDE repeated several checks in order to verify the validity of former tests.

Detailed documentation is integrated in SIMARIS configuration

SIEMENS

Additional tests
3rd party approbation with VDE



VDE Prüf- und Zertifizierungsinstitut
Zeichengenehmigung

Name und Sitz des Genehmigungs-Inhabers / *Name and registered seat of the Certificate holder*
Siemens AG, Low Voltage, Siemensstraße 10, 93055 Regensburg

Rubrik / *Rubric*: 341
Ausweis-Nr. / *Certificate No.*: 40047416
Anlage / *Appendix*: 204
Aktenzeichen / *File ref.*: 40017-1494-0009/224367/TL3/KOH
letzte Änderung / *updated*: 2019-04-23
Datum / *Date*: 2019-04-23

Dieses Blatt gilt nur in Verbindung mit Blatt 1 des Zeichengenehmigungsausweises Nr. 40047416.
This supplement is only valid in conjunction with page 1 of the Certificate No. ***Fehler! Verweisquelle konnte nicht gefunden werden.***

Energie-Schaltgerätekombinations-System Siemens SIVACON S4
***Power switchgear and controlgear assembly system* Siemens SIVACON S4**

Incoming Feeder Sections
Main busbar at top position

The values listed below take into account among others the following effects [1]:
- Main busbar per section
- Connections to busbar system by withdrawable design or fixed mounted design
- Form of internal separation up to 4b

Die unten aufgeführten Werte berücksichtigen u.a. folgende Effekte [1]:
- Hauptsammelschiene pro Feld
- Anbindungen zum Sammelschienensystem durch Einschubtechnik oder Festeinbautechnik
- Form der inneren Unterteilung bis 4b

[1] For further details see appropriate test reports / Siehe entsprechende Prüfberichte für nähere Informationen

Clearances and Creepages

size	type	Overvoltage category	Pollution degree	Material group	rated insulation voltage U_i [V]	rated impulse withstand voltage U_{imp} [kV]	Minimum clearances in air (requested by DIN EN 61439-1/2) [mm]	Clearances in air (measured) [mm]	Minimum creepage distance (requested by DIN EN 61439-1/2) [mm]	Creepage distance (measured) [mm]
I	3WL1120	IV	3	I	1.000	8	12,0	19,1 ± 0,3	12,5	30,0 ± 0,2
II	3WL1220	IV	3	I	1.000	8	12,0	40,0 ± 0,3	12,5	40,0 ± 0,2
III	3WL1363	IV	3	I	1.000	8	12,0	21,5 ± 0,3	12,5	70,0 ± 0,2

Vented up to IP41

size	type	rated current I_n of device [A]	rated current of circuit I_{cc} [A]	rated current of circuit I_{cc} at different ambient temperatures [A]							rated cond. short-circuit current I_{cc} [kA]	rated short-time withstand current I_{cw} (1s) [kA]	rated peak withstand current I_{pk} [kA]	rated insulation voltage U_i [V]	rated impulse withstand voltage U_{imp} [kV]
			35 °C	20 °C	25 °C	30 °C	35 °C	40 °C	45 °C	50 °C					
I	3WL1116	1.600	**1.550**	1.600	1.600	1.580	**1.550**	1.500	1.460	1.410	85	66	165	1.000	8
	3WL1120	2.000	**1.940**	2.000	2.000	1.990	**1.940**	1.890	1.830	1.780	85	66	165	1.000	8
	3WL1120[1]	2.000	**2.000**	2.000	2.000	2.000	**2.000**	2.000	2.000	1.990	85	66	165	1.000	8
II	3WL1220	2.000	**2.000**	2.000	2.000	2.000	**2.000**	2.000	2.000	2.000	100	80	220	1.000	8
	3WL1225	2.500	**2.500**	2.500	2.500	2.500	**2.500**	2.430	2.360	2.290	100	80	220	1.000	8
	3WL1232	3.200	**2.650**	2.850	2.780	2.710	**2.650**	2.570	2.500	2.430	100	80	220	1.000	8
III	3WL1340	4.000	**4.000**	4.000	4.000	4.000	**4.000**	3.980	3.900	3.810	85	100	220	1.000	8
	3WL1350	5.000	**5.000**	5.000	5.000	5.000	**5.000**	4.940	4.830	4.720	85	100	220	1.000	8
	3WL1363	6.300	**5.400**	5.720	5.620	5.510	**5.400**	5.280	5.170	5.050	85	100	220	1.000	8

- Detailed test description

- All technical parameters brought together
- Scaled from 25 °C up to 50 °C

SIEMENS

Additional tests
DAkkS – Inhouse lab for temperature rise verification

DAkkS
Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

Siemens Aktiengesellschaft
Wittelsbacher Platz 2, 80333 München

Location:
Siemens Aktiengesellschaft
Prüflaboratorium Böhlitz-Ehrenberg
Südstraße 74, 04178 Leipzig

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

Electrical engineering

The accreditation certificate shall only apply in connection with the notice of accreditation of 2015-12-16 with the accreditation number D-PL-11055-07 and is valid until 2020-12-15. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 02 pages.

Registration number of the certificate: **D-PL-11055-07-00**

Frankfurt am Main, 2015-12-16 — Ralf Egner, Head of Division — Translation issued: 2016-08-29 — Head of Division

This document is a translation. The definitive version is the original German accreditation certificate.

The test lab is accredited by „Deutsche Akkreditierungsstelle GmbH (DAkkS)" which is the national accreditation body for the Federal Republic of Germany: http://www.dakks.de/

The accreditation is registered under registration Nr. **D-PL-11055-07-00**.

The accreditation certifies that the lab acts as an independent, competent body according to the rules of ISO/IEC 17025 „General requirements for the competence of testing and calibration laboratories".

Not applicable

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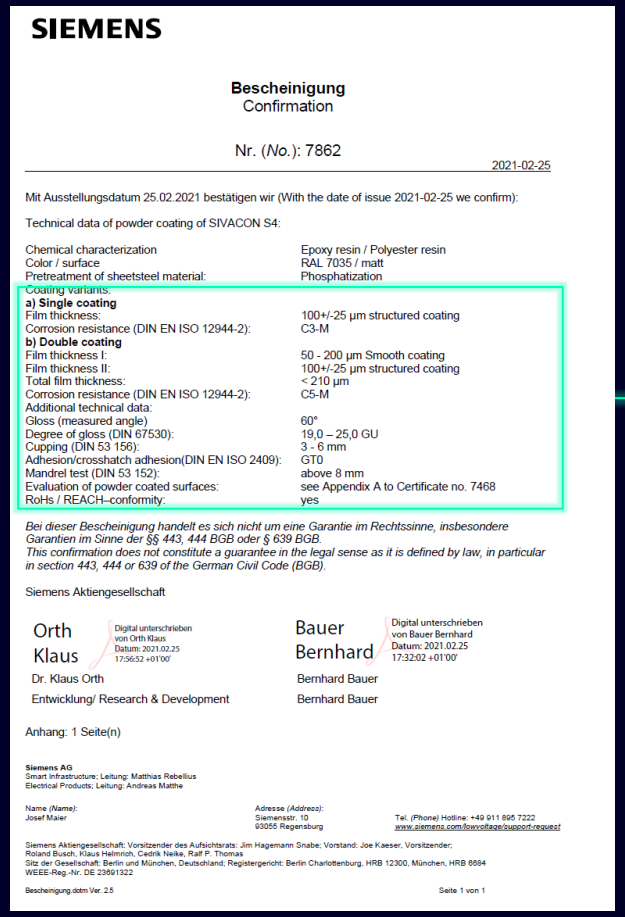
Additional test
Powder coating quality DIN EN ISO 12944-2



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Bescheinigung
Confirmation

Nr. (*No.*): 7862

2021-02-25

Mit Ausstellungsdatum 25.02.2021 bestätigen wir (With the date of issue 2021-02-25 we confirm):

Technical data of powder coating of SIVACON S4:

Chemical characterization	Epoxy resin / Polyester resin
Color / surface	RAL 7035 / matt
Pretreatment of sheetsteel material:	Phosphatization
Coating variants:	
a) Single coating	
Film thickness:	100+/-25 µm structured coating
Corrosion resistance (DIN EN ISO 12944-2):	C3-M
b) Double coating	
Film thickness I:	50 - 200 µm Smooth coating
Film thickness II:	100+/-25 µm structured coating
Total film thickness:	< 210 µm
Corrosion resistance (DIN EN ISO 12944-2):	C5-M
Additional technical data:	
Gloss (measured angle)	60°
Degree of gloss (DIN 67530):	19,0 – 25,0 GU
Cupping (DIN 53 156):	3 - 6 mm
Adhesion/crosshatch adhesion(DIN EN ISO 2409):	GT0
Mandrel test (DIN 53 152):	above 8 mm
Evaluation of powder coated surfaces:	see Appendix A to Certificate no. 7468
RoHs / REACH–conformity:	yes

Bei dieser Bescheinigung handelt es sich nicht um eine Garantie im Rechtssinne, insbesondere Garantien im Sinne der §§ 443, 444 BGB oder § 639 BGB.
This confirmation does not constitute a guarantee in the legal sense as it is defined by law, in particular in section 443, 444 or 639 of the German Civil Code (BGB).

Siemens Aktiengesellschaft

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Dr. Klaus Orth
Entwicklung/ Research & Development

Bauer Bernhard — Digital unterschrieben von Bauer Bernhard Datum: 2021.02.25 17:32:02 +01'00'
Bernhard Bauer
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Anhang: 1 Seite(n)

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Sitz der Gesellschaft: Berlin und München, Deutschland; Registergericht: Berlin Charlottenburg, HRB 12300, München, HRB 6684
WEEE-Reg.-Nr. DE 23691322

Bescheinigung.dotm Ver. 2.5

Seite 1 von 1

Single coating – standard
- Corrosion resistance: C3-M

Double coating – on request
- Corrosion resistance: C5-M

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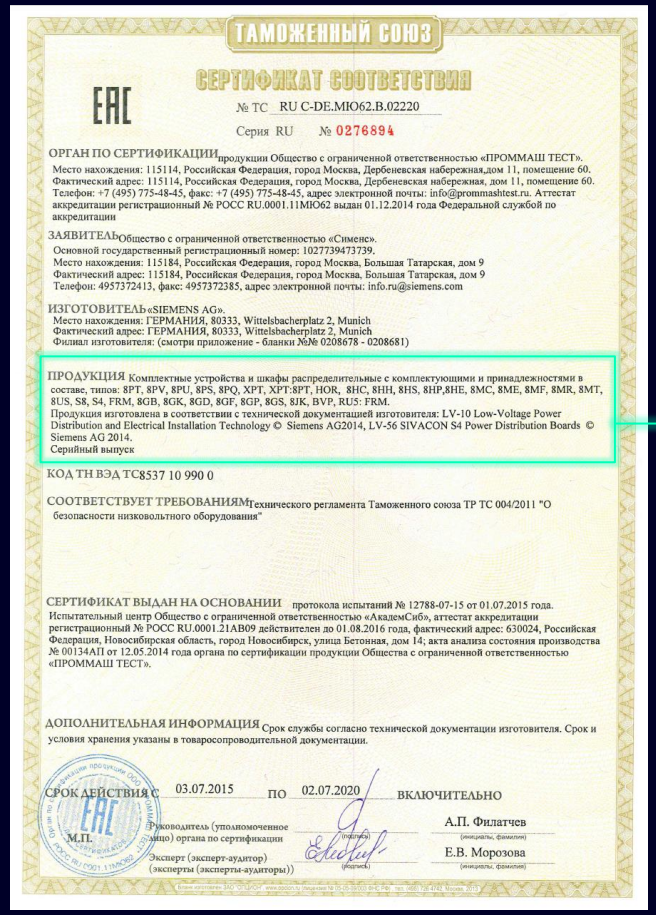
Additional test
EAC for exporting goods to russia



ТАМОЖЕННЫЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

EAC

№ ТС RU C-DE.МЮ62.В.02220

Серия RU № 0276894

ОРГАН ПО СЕРТИФИКАЦИИ продукции Общество с ограниченной ответственностью «ПРОММАШ ТЕСТ».
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Филиал изготовителя: (смотри приложение - бланки №№ 0208678 - 0208681)

ПРОДУКЦИЯ Комплектные устройства и шкафы распределительные с комплектующими и принадлежностями в составе, типов: 8PT, 8PV, 8PU, 8PS, 8PQ, XPT, XPT:8PT, HOR, 8HC, 8HH, 8HS, 8HP,8HE, 8MC, 8ME, 8MF, 8MR, 8MT, 8US, S8, S4, FRM, 8GB, 8GK, 8GD, 8GF, 8GP, 8GS, 8JK, BVP, RU5: FRM.
Продукция изготовлена в соответствии с технической документацией изготовителя: LV-10 Low-Voltage Power Distribution and Electrical Installation Technology © Siemens AG2014, LV-56 SIVACON S4 Power Distribution Boards © Siemens AG 2014.
Серийный выпуск

КОД ТН ВЭД ТС 8537 10 990 0

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ технического регламента Таможенного союза ТР ТС 004/2011 "О безопасности низковольтного оборудования"

СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ протокола испытаний № 12788-07-15 от 01.07.2015 года. Испытательный центр Общество с ограниченной ответственностью «АкадемСиб», аттестат аккредитации регистрационный № РОСС RU.0001.21АВ09 действителен до 01.08.2016 года, фактический адрес: 630024, Российская Федерация, Новосибирская область, город Новосибирск, улица Бетонная, дом 14; акта анализа состояния производства № 00134АП от 12.05.2014 года органа по сертификации продукции Общества с ограниченной ответственностью «ПРОММАШ ТЕСТ».

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Срок службы согласно технической документации изготовителя. Срок и условия хранения указаны в товаросопроводительной документации.

СРОК ДЕЙСТВИЯ С 03.07.2015 ПО 02.07.2020 ВКЛЮЧИТЕЛЬНО

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ПРОДУКЦИЯ Комплектные устройства и шкафы распределительные с комплектующими и принадлежностями в составе, типов: 8PT, 8PV, 8PU, 8PS, 8PQ, XPT, XPT:8PT, HOR, 8HC, 8HH, 8HS, 8HP,8HE, 8MC, 8ME, 8MF, 8MR, 8MT, 8US, S8, S4, FRM, 8GB, 8GK, 8GD, 8GF, 8GP, 8GS, 8JK, BVP, RU5: FRM.
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Summary

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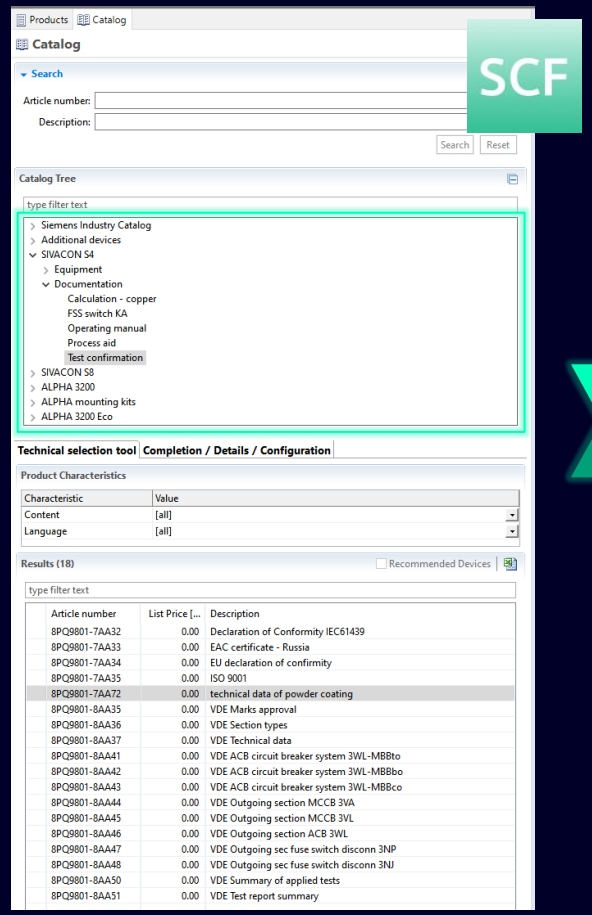
Summary
Certification – SIMARIS Configuration



SCF

Whole documentation available via SIMARIS configuration

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Summary
Customer Benefits

- The "make it easy" solution to fulfill **IEC 61439**
- SIVACON S4 offers **more than standard** requirements
- Quality **certification**
- **One partner** for housing and devices
- We have the best **knowledge** on our own devices
- **Deep integration level** of devices and accessories

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Thank you for your attention!

siemens.com/sivacon-s4

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