

Test Report

Report No.: 15-034-MS

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Contents: 50 Sheets

Test object: Control cubicle with three-pole automatic vacuum circuit recloser
Designation: Control cubicle with controller 7SC8024 with three-pole automatic vacuum circuit recloser 3AD3533-3 with vacuum interrupters VSR38-0-16
 Rated voltage: 38 kV Rated normal current: 800 A Rated frequency: 50/60 Hz
 Rated short-circuit breaking current: 16 kA
Manufacturer: Siemens AG, EM MS O SD BLN MF, Berlin
Client: Siemens AG, EM MS R&D OC, Berlin
Testing station: Prüffeld der Schaltwerke, Berlin
Date of test: January 27 - 28, 2015

Applied test specifications:

IEC 62271-111, Edition 2.0, 2012-09

Client instructions

Tests performed:

Time-current-curve tests according to IEC 62271-111, subcl. 6.108 for overcurrent protection with characteristic

- Definite-Time Overcurrent Protection with current pickup 50-1 (I>) for the whole current range
- Definite-Time Overcurrent Protection with current pickup 50-1 (I>), 50-2 (I>>) and 50-3 (I>>>) for three current ranges

Tests	I/I _s	Definite-Time Overcurrent Protection with current pickup 50-1				Definite-Time Overcurrent Protection with current pickup 50-1, 50-2 and 50-3			
		I _{sc}		Clearing time		I _{sc}		Clearing time	
		min	max	min	max	min	max	min	max
2xO	20	16.6 kA	16.6 kA	51.0 ms	51.1 ms	15.8 kA	16.1 kA	67.1 ms	67.1 ms
2xO	15.6	12.9 kA	12.9 kA	50.9 ms	50.9 ms	12.7 kA	12.9 kA	77.6 ms	77.7 ms
2xO	10	8.2 kA	8.2 kA	51.3 ms	51.4 ms	8.1 kA	8.1 kA	304 ms	298 ms
2xO	5	4.0 kA	4.1 kA	58.0 ms	58.4 ms	4.0 kA	4.0 kA	334 ms	315 ms
2xO	2.0	1.60 kA	1.60 kA	59.1 ms	60.2 ms	1.58 kA	1.58 kA	550 ms	555 ms
2xO	1.1	0.90 kA	0.90 kA	83.6 ms	89.2 ms	0.88 kA	0.88 kA	583 ms	586 ms

Test results:

The test object has passed the above indicated tests without any objection. The test object has passed within the allowed tolerances of IEC 62271-111 under consideration of the specified pickup times of the controller 7SC80.



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Berlin, July 15, 2015

The test results relate only to the items tested.

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Documents and Addresses

Accreditation

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PSW-Documents

A Certificate

is issued for type tests which have successfully been carried out in full compliance with the relevant specifications or standards valid at the time of the test. For these tests the equipment under test 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 valid at the time of test. For these tests the equipment under test 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 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 equipment during test, 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.

Addresses

Testing Station: Prüffeld der Schaltwerke, Berlin
Siemens AG
EM MS R&D OC TD
Nonnendammallee 104
13629 Berlin
Germany

Manufacturer: Siemens AG
EM MS O SD BLN MF
Nonnendammallee 104
13629 Berlin
Germany

Client: Siemens AG
EM MS R&D OC
Nonnendammallee 104
13629 Berlin
Germany

Technical Data of Test Object Control Cubicle with Controller

Test object: Control cubicle
Designation: Control cubicle 3AD3533-1BM61-6MQ2 with Controller 7SC8024-3BB97-3FB5/CC
Manufacturer: Siemens AG, EM MS O SD BLN MF, Berlin
Serial No.: S 3AD/00004194
Year of manufacture: 2015
Drawing No.: Drawings and part lists - see sheet 7

Ratings assigned by the manufacturer:

Power Supply	85 - 264 V ac	47-63 Hz
	48 VA	
Auxiliary Voltage	24 - 48 V dc	
Voltage Inputs (Phase)	100 - 125 V ac	
Current Inputs (Phase)	1 / 5 A	
Frequency Inputs	50 / 60 Hz	

Setting:

Definite-Time Overcurrent Protection with current pickup 50-1 (I>) for the whole current range for $I_{norm}=1A$	50-1 (I>): 1A, $t_{delay}=0ms$ 50-2 (I>>): disabled 50-3 (I>>>): disabled
Definite-Time Overcurrent Protection with current pickup 50-1 (I>), 50-2 (I>>) and 50-3 (I>>>) for three current ranges for $I_{norm}=1A$	50-1 (I>): 1A, $t_{delay}=500ms$ 50-2 (I>>): 3.8A, $t_{delay}=250ms$ 50-3 (I>>>): 12.5A, $t_{delay}=0ms$
Method of Measurement	Fundamental wave, true RMS value

Essential characteristics:

Control cubicle:	belongs to Recloser switch unit 3AD3533-1BM61-6MQ2
Serial number of cubicle	belongs to Recloser switch unit S 3AD/00004194
Controller type:	7SC8024-3BB97-3FB5/CC
Serial number of controller:	BF1503508319
Software Version:	V04.20.04

Pickup times (without inrush restraint, with inrush restraint + 1 cycle) for fundamental component, RMS value
 According to manual E50417-G1140-C486-A3, chapter 4 Technical Data

- for setting value x2	approx. 30 ms
- for setting value x10	approx. 20 ms
According to an additional account of the manufacturer of the controller	
- for setting value x1.1	approx. 44ms
- for setting value x1.3	approx. 38ms
- for setting value x1.9	approx. 35ms
- for setting value x5	approx. 21ms
- for setting value x15	approx. 20ms

Technical Data of Test Object Circuit Recloser

Test object:	Control cubicle with three-pole automatic vacuum circuit recloser
Designation:	Control cubicle with controller 7SC8024 with three-pole automatic vacuum circuit recloser 3AD3533-3 with vacuum interrupters VSR38-0-16
Manufacturer:	Siemens AG, EM MS O SD BLN MF, Berlin
Serial No.:	S 3AD/00004194
Year of manufacture:	2015
Drawing No.:	Drawings and parts lists - see sheet 7

Ratings assigned by the manufacturer:

Rated voltage	38 kV	
Rated normal current	800 A	
Rated frequency	50/60 Hz	
Rated lightning impulse withstand voltage	170 kV	
Rated power-frequency withstand voltage	70 kV	
Rated peak withstand current	42 kA	
Rated short-time withstand current	16 kA	
Rated duration of short-circuit	3 s	
Rated symmetrical making current (rms)	16 kA	
Peak factor [i_p/I]	2.6	
Rated symmetrical interrupting current (rms)	16 kA	
DC component of the rated short-circuit breaking current (Valid for a minimum clearing time of 50 ms and a time constant of 45 ms)	33 %	
Rated transient recovery voltage	71.7 kV	
Rate of rise of transient recovery voltage	1.29 kV/ μ s	
First-pole-to-clear factor	1.5	
Rated operating sequence	O - 0.2 s - CO - 3 s - CO - 3 s - CO	
Arc extinguishing medium	Vacuum	
Insulating medium	Epoxy / Air / Silicone	
Driving mechanism (type)	Magnetic drive	
Number of poles	3	
Number of units per pole	1	
Rated opening time	< 35 ms	
Rated minimum tripping current	40 A	
Rated control voltage	110-230 V	a.c.
Rated frequency of control voltage	50/60 Hz	
Rated line-charging breaking current	5 A	
Rated cable-charging breaking current	40 A	
Rated single capacitor bank breaking current	400 A	

Further data:

Serial number of vacuum interrupter in pole L1 / L2 / L3	160 / 190 / 192
Pole centre distance	375 mm

Essential characteristics:

Control cubicle with Controller see page 5