NOTIFICATION OF TEST RESULTS

Issued to:	Wago-Kontakttechnik GmbH & Co. KG Hansastrasse 27, 32423 Minden/Westfalen, Germany
For the product:	terminal blocks for copper conductors
Trade name:	WAGO
Type/Model:	284 / 784
Manufactured by:	Wago-Kontakttechnik GmbH & Co. KG Hansastrasse 27, 32423 Minden/Westfalen, Germany
Ratings:	Typ 284: 800 V, Type 784: 400 V - 1000 V
Additional information:	This NTR replaces NTR-NL-7147 dated 2013-04-29

Pre-licence factory inspection carried out by
DEKRA Certification B.V.

A sample of the product has been tested and found to be in conformity with the current HD/EN and equivalent national standard
EN 60947-7-1:2009, EN 60947-7-2:2009

As shown in the Test Report
2178517.50, 2178517.51

This Notification of Test Results is the result of testing a sample of the product submitted, in accordance with the provisions of the relevant specific standard.

This Notification of Test Results has been established by a body, which participates in the CENELEC Certification Agreement (CCA) of 11th September 1973 as amended on 29th March 1983. Any other body participating in the CCA will take this Notification as a basis for granting a national mark of conformity or a national approval as specified in the CCA, as long as the standard referred to above is still in force in the country of that body.

Arnhem, 10 March 2015 Number: NTR NL-7379

DEKRA Certification B.V.

H.R.M. Barends
Certification Manager

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CCA
CENELEC CERTIFICATION AGREEMENT
ACCORD DE CERTIFICATION DU CENELEC

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ECS
European Certification System

OD ECS 040-1
ed. May 2013

Responsible CB:

DEKRA

TEST REPORT SUMMARY

Report Reference No. ..... :	**2178517.50/51**
Date of issue ..... :	**2015-03-09**
Tested by (name + signature) ..... :	**W.C. van Ginkel**
Witnessed by (name + signature) .... :	
Approved by (name + signature) ..... :	**H.L. Schendstok**
Supervised by (name + signature) ... :	
Testing Laboratory ..... :	**DEKRA Certification B.V.**
Address ..... :	Meander 1051, 6825 MJ Arnhem, The Netherlands
Testing procedure ..... :	☒ ENEC/CCA-TL ☐ IECEE-CBTL ☐ TMP ☐ WMT ☐ SMT
Testing location ..... :	**DEKRA Certification B.V.**
Address ..... :	**Meander 1051, 6825 MJ Arnhem, The Netherlands**
Applicant ..... :	**WAGO Kontakttechnik GmbH**
Address ..... :	**Hansastraße 27, 32423 Minden, Germany**
Manufacturer ..... :	**WAGO Kontakttechnik GmbH**
Address ..... :	**Hansastraße 27, 32423 Minden, Germany**
Product ..... :	**Terminal block for copper conductors for mounting on a rail**
Model/Type reference ..... :	**284 / 784**
Trademark ..... :	**WAGO**
Ratings ..... :	**Type 284: 800 V, Type 784: 400 V – 1000 V**
Certification Scheme ..... :	☐ ENEC ☒ CCA ☐ Other: _____
Standard(s) ..... :	**EN 60947-7-1:2009, EN 60947-7-2: 2009**

☒ The text of the a.m. European Standard was approved by CENELEC under the Unique Acceptance Procedure and is identical with the corresponding IEC Publication.

☐ The text of the a.m. European Standard was approved by CENELEC with agreed common modifications and is not identical with the corresponding IEC Publication.

This EN test report consists of the following parts:

☒ **IEC TRF No.:** IEC60947_7_1A, IEC60947_7_2A	Report Reference No.....:	**2178517.50, 2178517.51**
☐ **CENELEC-Addendum Form No.** _____ .....**:**	Report Reference No. or Annex No...:	**-**

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Test Report issued under the responsibility of:

DEKRA

TEST REPORT
IEC 60947-7-1
Low-voltage switchgear and controlgear
Part 7: Ancillary equipment
Section One: Terminal blocks for copper conductors

Report Reference No. ..... :	2178517.50
Date of issue..... :	2015-03-04
Total number of pages.....	25
CB/CCA Testing Laboratory..... :	DEKRA Certification B.V.
Address ..... :	Meander 1051, 6825 MJ Arnhem, The Netherlands
Applicant's name..... :	WAGO Kontakttechnik GmbH
Address ..... :	Hansastrasse 27, 32423 Minden Germany
Test specification:	
Standard..... :	IEC 60947-7-1:2009 (Third Edition)
Test procedure..... :	CB Scheme
Non-standard test method……..:	N/A
Test Report Form No. ..... :	IEC60947_7_1A
Test Report Form(s) Originator ..... :	KEMA Quality B.V.
Master TRF ..... :	Dated 2009-07

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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description..... :	Terminal block for copper conductors for mounting on a rail
Trade Mark ..... :	WAGO
Manufacturer ..... :	WAGO Kontakttechnik GmbH
Model/Type reference..... :	284/784
Ratings..... :	284: 800 V
	784: 400 V – 1000 V
Factory location .....:	See product information

Testing procedure and testing location:	
☒ **CB Testing Laboratory**:	DEKRA Certification B.V.
Testing location/ address ..... :	Meander 1051, 6825 MJ Arnhem, The Netherlands
☐ **Associated CB Laboratory:**	
Testing location/ address ..... :	
Tested by (name + signature) .... :	W.C. van Ginkel
Approved by (+ signature)..... :	H.L. Schendstok
☐ Testing procedure: TMP	
Tested by (name + signature) .... :	
Approved by (+ signature)..... :	
Testing location/ address ..... :	
☐ Testing procedure: WMT	
Tested by (name + signature) .... :	
Witnessed by (+ signature) ..... :	
Approved by (+ signature)..... :	
Testing location/ address ..... :	
☐ Testing procedure: SMT	
Tested by (name + signature) .... :	
Approved by (+ signature)..... :	
Supervised by (+ signature) ..... :	
Testing location/ address ..... :	
☐ Testing procedure: RMT	
Tested by (name + signature) .... :	
Approved by (+ signature)..... :	
Supervised by (+ signature) ..... :	
Testing location/ address ..... :	

Summary of testing:	
Tests performed (name of test and test clause): All relevant tests	**Testing location:** DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem, The Netherlands
Summary of compliance with National Differences:	

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict

Copy of marking plate:

WAGO 284

800 V

10 mm²

IEC 60947-7-1

WAGO topjob 784-6..

1000 V

10 mm²

IEC 60947-7-1

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict

Test item particulars..... :		
Classification of installation and use ..... :		
Supply Connection..... :		
Particulars: test item vs. test requirements		
- method of fixing..... :	Top hat rail 35 mm (EN 50022)	
- number of poles..... :	1-pole	
- type of clamping units..... :	screwless-type terminals	
- ability to receive conductors ..... :	unprepared conductors, flexible or rigid	
- number of terminals on terminal assembly..... :	2	
- rated cross-section (mm²)..... :	10 mm²	
- rated connecting capacity (mm²)..... :	0,2 mm² - 10 mm² (rigid or flexible)	
- rated insulation voltage (Ui)..... :	type: 284: 800 V	
	type: 784: 400 V – 1000 V	
- rated impulse withstand voltage (Uimp)..... :	6 kV - 8 kV	
- Conventional free air thermal current (Ith) ..... :		
Possible test case verdicts:		
- test case does not apply to the test object..... :	N/A	
- test object does meet the requirement ..... :	P (Pass)	
- test object does not meet the requirement ..... :	F (Fail)	
Testing ..... :		
Date of receipt of test item..... :	2014-12-11	
Date (s) of performance of tests..... :	2015-01-07	

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

All tests are carried out on 784-601, 784-613, 284-101, 284-601 and 284-604 unless otherwise stated.
This test report replaces test report 2160584.118 dated 2013-04-29

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict

General product information:

The terminal block may be produced in the following factory locations:

Wago Elwag sp.z.o.o.
ul. Piekna 58 a, 50-506, Wroclaw
Poland

Wago & Controls (India) Ltd.
C-27, Sector-58, Phase III, 201 301 Noida Gautam Bugh Nagar (U.P)
India

Wago Electronic (Tianjin) Co. Ltd.
No. 5 Quanhui Road, 301700, Tianjin
China

WAGO Kontakttechnik GmbH & Co. KG
Hansastraße 27, 32423 Minden/Westfalen
Germany

WAGO Kontakttechnik GmbH & Co. KG, Werk Sondershausen
Waldstraße 1, 99706, Sondershausen
Germany

WAGO Contact S.A.
Route de l'Industrie 19, 1564, Domdidier
Switzerland

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
5.1	**MARKING**		
	Terminal block shall be marked with:		
	- manufacturer's name or trademark	WAGO	P
	- type designation	284/784	P
5.2	The following information shall be stated by the manufacturer if applicable, e.g. in the manufacturer's data sheet, or his catalogue or on the packing unit:		
	- manufacturer's claim for compliance with IEC 60 947-7-1	IEC 60947-7-1	P
	- rated cross-section	10 mm²	P
	- rated connecting capacity	In cataloque 0,2 - 10 mm²	P
	- rated insulation voltage (Ui)	400 V – 1000 V	P
	- rated impulse withstand voltage (Uimp)	In cataloque 6 kV- 8 kV	P
	- conventional free air thermal current (Ith)		N/A
	- service conditions if different from those of Cl. 6.		N/A

7.	**CONSTRUCTION**		
7.1	Constructional requirements		
7.1.1	Clamping units		
7.1.7.1	All parts of clamping units which maintain contact and carry current shall be of metal having adequate mechanical strength		P
	Clamping units connections shall be such that necessary contact pressure is maintained		P
	Clamping units shall be so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal		P
	Clamping units shall not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operation of equipment and the insulation voltage shall not be reduced below the rated value		P

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Clamping units shall allow the conductor to be connected by means ensuring that a reliable mechanical linkage and electrical contact is properly maintained		P
	Clamping units shall be able to withstand the forces that can be applied through the connected conductors		P
	Contact pressure is not transmitted through insulation materials		P
7.1.2	Mounting		
	Terminal blocks shall be provided with means that allow them to be securely attached to a rail or a mounting surface (see 8.3.2)		P
7.1.3	Clearances and creepage distances		
	For clearances and creepage distances see 8.4.2		
7.1.4	Terminal identification and marking:		
	- terminals intended exclusively for the neutral conductor	Bleu	P
	- other terminals		
	- terminal blocks shall have provision, or at least space, for identification marks or numbers for each terminal or terminal assembly to be related to the circuit of which it is to form a part		P
	- For the identification of the terminal block the colour combination green-yellow is not allowed		P
7.1.5	Resistance to abnormal heat and fire		
	Needle flame test for insulation materials of terminal blocks (see 8.5)		P
7.1.6	Rated cross-section and rated connecting capacity		
	Terminal blocks are so designed that conductors of the rated cross-section and/or the rated connecting capacity can be accepted	0,2 mm² - 10 mm² Flexible or rigid	P

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
8	**TESTS**		
8.3	Verification of mechanical characteristics		
8.3.2	Attachment of the terminal block on its support		
	mounting rail .....:	EN 50022 (35 mm)	—
	Tighting torque (Nm) ..... :	-	—
	steel pin diameter (mm) .....:	2,8 mm	—
	force (N) .....:	5 N	—
	During the test, no terminal block shall work free from its rail or support, nor suffer any other damage		P
8.3.3	Mechanical properties of clamping units		
8.3.3.1	Test of mechanical strength of clamping units		
8.2.4.1	Mechanical strength of clamping units (IEC60947-1)		
	rated cross-section of a rigid conductor (mm²) ....:	10 mm²	—
	diameter of thread (mm) .....:	-	—
	torque (Nm) .....:	-	—
	5 times on 2 clamping units at the centre terminal block out of 5 terminal blocks	5 times inserted and removed	P
	Voltage drop before and after mechanical strength test		
	rated cross-section of a rigid conductor (mm²) ....:	10 mm²	—
	test current (A) d.c. .....:	5,7 A	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV .....:	1,15 mV - 2,10 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test :	1,2 mV - 2,15 mV	P

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	minimum cross-section of a flexible conductor (mm²) .....:	0,2 mm²	—
	test current (A) d.c. .....:	0,4 A	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV .....:	0,61 mV - 1,19 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test .....:	0,65 mV - 1,27 mV	P
8.2.4.1	Mechanical strength of clamping units (IEC60947-1) **(type 784-604)**		
	rated cross-section of a rigid conductor (mm²) ....:	10 mm²	—
	diameter of thread (mm) .....:	-	—
	torque (Nm) .....:	-	—
	5 times on 2 clamping units at the centre terminal block out of 5 terminal blocks	5 times inserted and removed	P
	Voltage drop before and after mechanical strength test		
	rated cross-section of a rigid conductor (mm²) ....:	10 mm²	—
	test current (A) d.c. .....:	5,7 A	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV .....:	1,69 mV – 1,42 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test :	1,79 mV – 1,56 mV	P
	minimum cross-section of a flexible conductor (mm²) .....:	0,2 mm²	—
	test current (A) d.c. .....:	0,4 A	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV .....:	1,19 mV - 1,26 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test .....:	1,25 mV – 1,34 mV	P
8.3.3.2	Testing for damage to and accidental loosening of conductors of a terminal block (flexion test)		
	conductor of the smallest cross-section (mm²) ...:	0,2 mm (rigid/flexible)	—
	number of conductors of the smallest cross-section .....:	1	—
	torque (Nm) .....:	-	—
	diameter of bushing hole (mm) .....:	6,4 mm	—
	height between the equipment and the platen (mm) .....:	260 mm	—
	mass at the conductor(s) (kg) .....:	0,3 kg	—
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		
	force (N) .....:	10 N	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	conductor of the rated cross-section (mm²) .....:	10 mm² (rigid/flexible)	—
	number of conductors of the rated cross-section :	1	—
	torque (Nm) .....:		—
	diameter of bushing hole (mm) .....:	9,5 mm	—
	height between the equipment and the platen (mm) .....:	270 mm	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	mass at the conductor(s) (kg) .....:	2,0 kg	—
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		
	force (N) .....:	90 N	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	conductor of the largest cross-section (mm²) .....:	10 mm² (rigid/flexible)	—
	number of conductors of the largest cross-section:	1	—
	torque (Nm) .....:		—
	diameter of bushing hole (mm) .....:	9,5 mm	—
	height between the equipment and the platen (mm) .....:	270 mm	—
	mass at the conductor(s) (kg) .....:	2,0 kg	—
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		
	force (N) .....:	90 N	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	conductor of the largest or smallest cross-section (mm²) .....:		—
	number of conductors of the largest or smallest cross-section .....:		—
	torque (Nm) .....:		—
	diameter of bushing hole (mm) .....:		—
	height between the equipment and the platen (mm) .....:		—
	mass at the conductor(s) (kg) .....:		—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) .....:		—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
8.3.3.4	Verification of rated cross section and rated connecting capacity		
	One conductor of the two next smaller cross-sections can be unhindered and connected in each clamping unit of one terminal block (up to 35 mm²)	4 mm²	P
8.4.2	Verification of clearances and creepage distances **(type 282-821 and 282-811)**		
	Conductor type and conductor cross-section	10 mm² rigid	—
	Conductor end length (mm)	12-13 mm	—
	Type of support	EN 50022 (35 mm)	—
8.4.2.2	Clearances		
	Case A (mm) ..... : Case B (mm) ..... : Measured (mm) ..... :	8 mm 3 mm 12,8 mm	P
	Rated impulse withstand voltage Uimp (kV)	8 kV	P
8.4.2.3	Creepage distances:		
	- pollution degree .....:	3	—
	- comparative tracking index (V) .....:	600 V	—
	- material group .....:	I	—
	- rated insulation voltage Ui (V) .....:	400 V, 800 V and 1000 V	—
	- minimum creepage distances (mm) .....:	400 V: 5,0 mm 800 V: 10 mm 1000 V: 12,5 mm	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- measured creepage distances (mm) .....:	400 V: > 6,41 mm 800 V: > 10,73 mm 1000 V: > 12,5 mm	—
8.4	Verification of electrical characteristics		
8.4.3	Dielectric tests		
	Dielectric test, Uimp indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm) .....:	10 mm² / rigid / 10 mm	—
	- rated impulse withstand voltage (kV) .....:	6 kV or 8 kV	—
	- test Uimp main circuits (kV) .....:	7,4 kV or 9,8 kV	P
	Dielectric test, Uimp not indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm) :	10 mm² / rigid / 10 mm	—
	- rated insulation voltage (V) .....:	400 V, 800 V or 1000 V	—
	- test voltage for 5 sec (V) .....:	2500 V, 3000 V and 3500 V	P
8.4.5	Temperature-rise test		
	Temperature-rise conditions: **on through terminal blocks**		
	- test current (A) .....:	57 A	—
	- cross-section of the conductor (mm²) .....:	10 mm²	—
	- torque (Nm) .....:		—
	- temperature-rise does not exceed 45 K	Max. 43 K	P
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	5,7 A	—
	- voltage drop (mV) before temperature-ise test not exceeding 3,2 mV .....:	1,07 mV - 2,8 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test .....:	1,18 mV - 2,8 mV	P
8.4.5	Temperature-rise test		
	Temperature-rise conditions: **on through terminal blocks type 784-604**		
	- test current (A) .....:	57 A	—
	- cross-section of the conductor (mm²) .....:	10 mm²	—
	- torque (Nm) .....:		—
	- temperature-rise does not exceed 45 K	Max. 33 K	P
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	5,7 A	—
	- voltage drop (mV) before temperature-ise test not exceeding 3,2 mV .....:	1,4 mV - 1,81 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test .....:	1,37 mV – 1,69 mV	P
8.4.6	Short-time withstand current test **on through terminal blocks**		
	- rated cross-section of the conductor (mm²) .....:	10 mm²	—
	- torque (Nm) .....:		—
	- test current (A) .....:	1200 A	—
	- duration of the test current (s) .....:	1 sec.	—
	At the end of the test, continuity shall exist on the test sample assembly and the terminal blocks shall not show any cracking, breakage or other critical damage		P
	Voltage drop before and after short-time withstand current test		
	- test current (A) d.c. .....:	5,7 A	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) before short-time withstand current test not exceeding 3,2 mV .....:	1,13 mV - 2,2 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	- voltage drop (mV) after short-time withstand current test not exceeding 150% of the value measured before short-time withstand current test .....:	1,0 mV - 2,6 mV	P
8.4.7	Ageing test (for screwless-type terminal blocks only) **on through terminal blocks**		
	Maximum ambient temperature (°C) .....:	40 °C /	—
	Rated cross-section rigid or stranded < 10 mm² solid, > 10 mm² stranded (mm²) .....:	10 mm² on request of the manufacturer test carried out with flexible	—
	Heating cabinet is increased, in each cycle to (°C) .....:	40 °C	—
	Test current (A) d.c. for measurement of the voltage drop .....:	5,7 A	—
	Voltage drop after 0 cycles:		
	- requirement: ≤ 3,2 mV (mV) .....:	1,23 mV - 2,38 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	Voltage drop after the 24th cycle:		
	- requirement: 4,8 mV (mV) .....:	1,18 mV - 2,6 mV	P
	Voltage drop after the 48th cycle		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,12 mV - 2,63 mV	P
	Voltage drop after the 72nd cycle:		

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,11 mV - 2,48 mV	P
	Voltage drop after the 96th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,09 - 2,57 mV	P
	Voltage drop after the 120th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,09 - 2,57 mV	P
	Voltage drop after the 144th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,09 - 2,74 mV	P
	Voltage drop after the 168th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,07 mV - 2,26 mV	P
	Voltage drop after the 192nd cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,07 mV - 2,51 mV	P
	Pull-out test		
	force (N) .....:	90 N	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
8.5	Verification of thermal characteristics is checked by the needle flame test.		P
	Before the test, the terminal blocks are stored for 24 h in an atmosphere having a temperature between 15°C and 35°C and a relative humidity between 45% and 75%		P
	The flame is applied for 10 s. for insulation walls <1 mm and / or an area < 100 mm², the flame is applied for 5 s.		P
	The terminal blocks are considered to have passed the test if the duration of burning is < 30s		P

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	in case of ignition. Moreover, the tissue paper on the pinewood board shall not ignite if burning or glowing particles fall from the terminal block.		
8.6	Verification of EMC characteristics		N/A
	Subclause 8.4 of IEC 60947-1 applies with the following addition:		N/A
8.6.1	Immunity		
	Terminal blocks within the scope of this standard are not sensitive of electromagnetic disturbances and therefore no immunity tests are necessary.		N/A
8.6.2	Emission		
	Terminal blocks within the scope of this standard do not generate electromagnetic disturbances and therefore no emission tests are necessary.		N/A
Annex A	**vacant**		N/A
Annex B	**informative**		
	Items subject to agreement between manufacturer and user		N/A
Annex C	**vacant**		N/A
Annex D	**ADDITIONAL REQUIREMENTS FOR TEST DISCONNECT TERMINALBLOCKS**		
D5	Product information **(type 784-613)**		
	- service life in number of cycles	200 x	P
D6.	Normal service, mounting and transport conditions		
	Clause 6 applies.		N/A
D7	Construction and performance conditions		
	Clause 7 applies with the following additions		

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
D7.1	Constructional requirements		
D7.1.3	Clearances and creepages are not required to be measured over the open disconnect contacts (Gap). However, the rated impulse withstand voltage (Uimp) stated by the manufacturer according to table 13 of IEC 60947-1, without using the altitude correction factor, shall be verified across the open disconnect contacts (gap) (see D.7.2.2)		P
D7.1.7	Disconnect unit		
	For longitudinal and perpendicular disconnection, test disconnect terminal blocks may be equipped with disconnect units, for instance of the following type: - plug - knife - slide (with or without busbar)	Slide	P
	the position of the disconnect unit shall be recognizable in normal use and shall not be changed unintentionally		P
D.7.2.2	Dielectric properties		
	Dielectric test, Uimp indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length tested over open disconnect contacts (gap) (mm) .....:	10 mm² / rigid / 10 mm	—
	- rated impulse withstand voltage (kV) .....:	6 kV	—
	- test Uimp without altitude correction factor (kV) :	6 kV	P
D.8.4.5	Temperature-rise test		
	Temperature-rise conditions:		
	- test current (A) .....:	57 A	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- cross-section of the conductor (mm²) .....:	10 mm²	—
	- torque (Nm) .....:		—
	- torque disconnect unit (Nm) .....:		—
	- temperature-rise does not exceed 45 K	30 K - 33 K Disconnect part 37 K	P
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	5,7 A	—
	- voltage drop (mV) before temperature-rise test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points .....:	3 x 1,6 mV = 4,8 mV 1,66 mV - 1,73 mV	P
	If the measured value exceeds this calculated value, the voltage drop is measured on each individual conductor clamping unit and disconnect unit contact point. it shall not exceed 1,6 mV on any conductor clamping unit and disconnect unit contact point		N/A
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test .....:	1,66 mV - 1,74 mV	P
D.8.4.6	Short-time withstand current test		
	- rated cross-section of the conductor (mm²) .....:	10 mm²	—
	- torque (Nm) .....:		—
	- torque disconnect unit (Nm) .....:		—
	- test current (A) .....:	1200 A	—
	- duration of the test current (s) .....:	1 sec.	—
	At the end of the test, continuity shall exist on the test sample assembly and the terminal blocks shall not show any cracking, breakage or other critical damage		P
	Voltage drop before and after short-time withstand current test		
	- test current (A) d.c. .....:	5, 7 A	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) before temperature-rise test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points .....:	3 x 1,6 mV = 4,8 mV 1,53 mV	P
	If the measured value exceeds this calculated value, the voltage drop is measured on each individual conductor clamping unit and disconnect unit contact point. it shall not exceed 1,6 mV on any conductor clamping unit and disconnect unit contact point		N/A
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test .....:	2,14 mV	P
D.8.4.7	Ageing test for test disconnect terminal blocks with screwless-type clamping units		
	Maximum ambient temperature (°C) .....:	40 °C	—
	Rated cross-section rigid or stranded < 10 mm² solid, > 10 mm² stranded (mm²) .....:		—
	Test current (A) according D.8.4.5 .....:		—
	Torque disconnect unit (Nm) .....:		—
	Heating cabinet is increased, in each cycle to (°C) .....:		—
	Test current (A) d.c. for measurement of the voltage drop .....:		—
	Voltage drop after 0 cycles:		
	- requirement: ≤ 1,6 mV (mV) .....: the voltage drop is determined on each individual clamping unit separately		N/A
	Voltage drop after the 24th cycle:		
	- requirement: 2,4 mV (mV) .....:		N/A
	Voltage drop after the 48th cycle		

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:		N/A
	Voltage drop after the 72nd cycle:		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:		N/A
	Voltage drop after the 96th cycle:		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:		N/A
	Voltage drop after the 120th cycle:		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:		N/A
	Voltage drop after the 144th cycle:		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:		N/A
	Voltage drop after the 168th cycle:		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:		N/A
	Voltage drop after the 192nd cycle:		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:		N/A
	Pull-out test		
	force (N) .....:		—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
D.8.5.1	Service life		
	- rated cross-section of the conductor (mm²) .....:	10 mm²	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- torque (Nm) .....:		—
	- torque disconnect unit (Nm) .....:		—
	- number of operating cycles .....:	200 x	—
	Entire test apparatus is stored for 168 h in dry heat at a temperature of 85 °C		P
	Voltage drop before and after service life		
	- test current (A) d.c. .....:	4,7 A	—
	- voltage drop (mV) before service life test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points :	3 x 1,6 mV = 4,8 mV 1,7 mV - 2,06 mV	P
	If the measured value exceeds this calculated value, the voltage drop is measured on each individual conductor clamping unit and disconnect unit contact point. it shall not exceed 1,6 mV on any conductor clamping unit and disconnect unit contact point		N/A
	- voltage drop (mV) after service life test not exceeding 150% of the value measured before service life test .....:	1,48 mV - 2,75 mV	P
D.8.4.5	Emission		
	Terminal blocks within the scope of this standard are not sensitive of electromagnetic disturbances and therefore no immunity tests are necessary.		N/A
8.6.2	Emission		
	Terminal blocks within the scope of this standard do not generate electromagnetic disturbances and therefore no emission tests are necessary.		N/A

Remarks

Description of the types

product data of rail mounted through terminal blocks

rated voltage	:	800 V
rated impulse withstand voltage	:	8 kV
types	:	284-... with suffixes -101, -103, -104, -191, -601, -604, -605, -691, -901, -902, -903, -904, -905, -906, -992
description	:	two-conductor through terminal block, 1-pole
types	:	284-... with suffixes -681, -682, -683, -684, -685, -686, -993
description	:	three-conductor through terminal block, 1-pole

product data of rail mounted earth terminal blocks

types	:	284-... with suffixes -107, -607, -907, -610, -107/999-950 -607/999-950, -907/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	284-... with suffixes -687, -687/999-950
description	:	three-conductor earth terminal block, 1-pole

product data of rail mounted terminal blocks

rated voltage	:	1000 V
rated impulse withstand voltage	:	8 kV
types	:	784-... with suffixes -601, -604, 992
description	:	two-conductor through terminal block, 1-pole

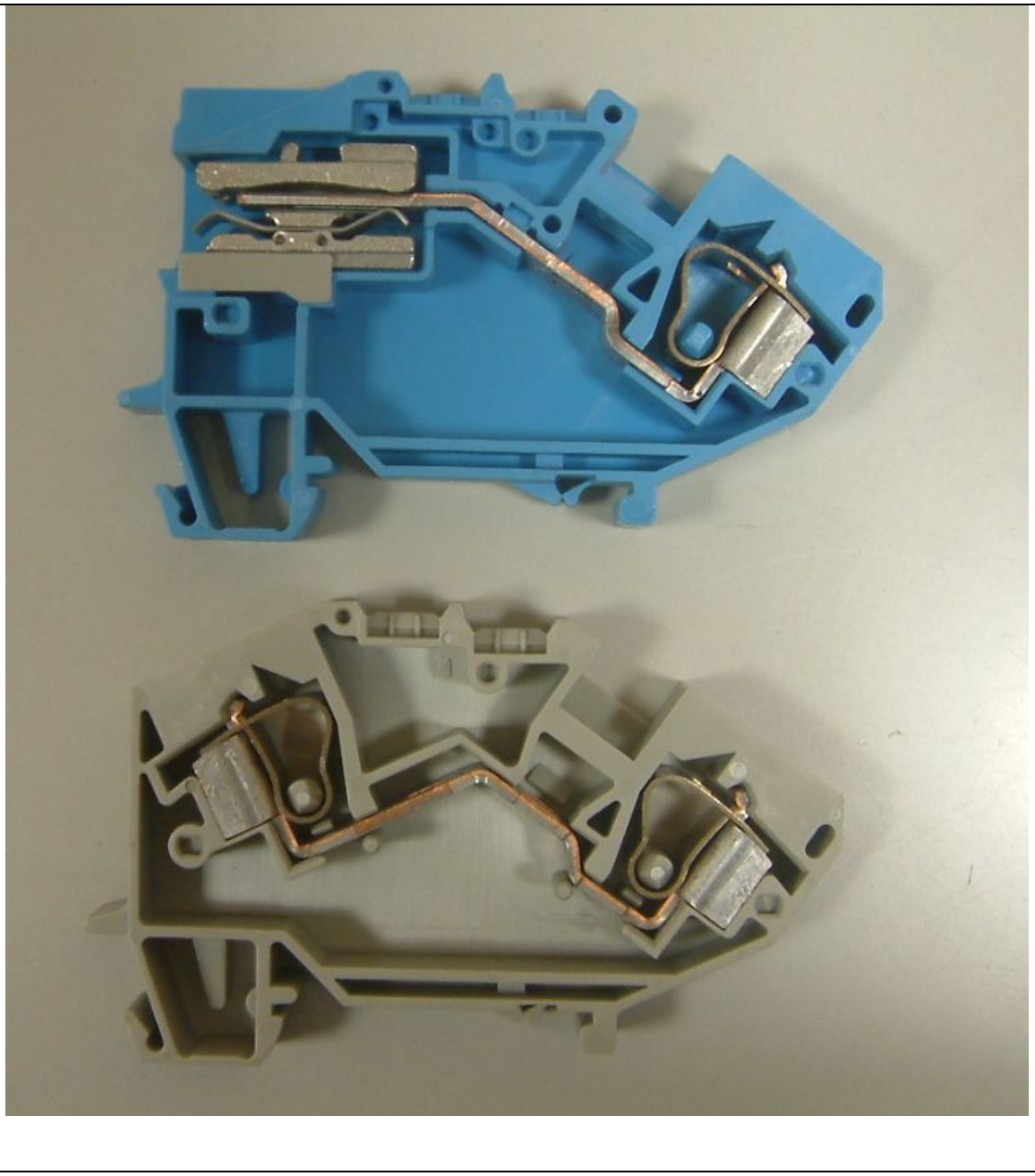
product data of rail mounted earth terminal blocks

types	:	784-... with suffixes -607, -607/999-950
description	:	two-conductor earth terminal block, 1-pole

product data of rail mounted neutral terminal blocks

rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
type	:	784-613
description	:	two-conductor through terminal block with neutral busbar connection of a busbar 3 x 10 mm, 1-pole

Remarks



Test Report issued under the responsibility of:

DEKRA

TEST REPORT
IEC 60947-7-2
Low-voltage switchgear and controlgear
Part 7: Ancillary equipment
Section Two: Protective terminal blocks for copper conductors

Report Reference No. ..... :	2178517.51
Date of issue..... :	2015-03-09
Total number of pages.....	22
CB Testing Laboratory ..... :	DEKRA Certification B.V.
Address ..... :	Meander 1051, 6825 MJ Arnhem, The Netherlands
Applicant's name ..... :	WAGO Kontakttechnik GmbH
Address ..... :	Hansastrasse 27, 32423 Minden Germany
Test specification:	
Standard..... :	IEC 60947-7-2:2009 (Third Edition)
Test procedure..... :	CB scheme
Non-standard test method……..:	N/A
Test Report Form No. ..... :	IEC60947_7_2A
Test Report Form(s) Originator ..... :	KEMA Quality B.V.
Master TRF ..... :	Dated 2009-07

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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description..... :	Ground earth conductor terminal blocks
Trade Mark ..... :	WAGO
Manufacturer ..... :	WAGO Kontakttechnik GmbH
Model/Type reference..... :	284/784
Ratings ..... :	284: 800 V
	784: 400 V – 1000 V
Factory location..... :	See product information

Testing procedure and testing location:
☒ **CB Testing Laboratory**: DEKRA Certification B.V. Testing location/ address ..... : Meander 1051, 6825 MJ Arnhem, The Netherlands ☐ **Associated CB Laboratory:** Testing location/ address ..... : Tested by (name + signature) .... : W.C. van Ginkel Approved by (+ signature)..... : H.L. Schendstok
☐ Testing procedure: TMP Tested by (name + signature) .... : Approved by (+ signature)..... : Testing location/ address ..... :
☐ Testing procedure: WMT Tested by (name + signature) .... : Witnessed by (+ signature) ..... : Approved by (+ signature)..... : Testing location/ address ..... :
☐ Testing procedure: SMT Tested by (name + signature) .... : Approved by (+ signature)..... : Supervised by (+ signature) ..... : Testing location/ address ..... :
☐ Testing procedure: RMT Tested by (name + signature) .... : Approved by (+ signature)..... : Supervised by (+ signature) ..... : Testing location/ address ..... :

Summary of testing:	
Tests performed (name of test and test clause): All relevant tests	**Testing location:** DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem, The Netherlands
Summary of compliance with National Differences:	

Copy of marking plate

WAGO 284
10 mm²
IEC 60947-7-2

WAGO topjob 784-6..
10 mm²
IEC 60947-7-2

Test item particulars..... :	
Classification of installation and use ..... :	
Supply Connection..... :	
Particulars: test item vs. test requirements	
- method of fixing :	top hat rail 35 mm (EN 50022)
- number of poles..... :	1-pole
- type of clamping unit ..... :	screwless-type terminal
- ability to receive conductors ..... :	unprepared conductors (flexible or rigid)
- number of terminals on terminal assembly..... :	2
- PE or PEN functions..... :	PE and PEN function
- rated cross-section (mm²)..... :	10 mm²
- rated connecting capacity (mm²)..... :	0,2 - 10 mm² (rigid or flexible)
Possible test case verdicts:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)
Testing ..... :	
Date of receipt of test item..... :	2014-12-11
Date (s) of performance of tests..... :	2015-01-07

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

All tests are carried out on 784-607 unless otherwise stated.
This test report replaces test report 2160584.119 dated 2013-04-29

General product information:

The terminal block may be produced in the following factory locations:

Wago Elwag sp.z.o.o.
ul. Piekna 58 a, 50-506, Wroclaw
Poland

Wago & Controls (India) Ltd.
C-27, Sector-58, Phase III, 201 301 Noida Gautam Bugh Nagar (U.P)
India

Wago Electronic (Tianjin) Co. Ltd.
No. 5 Quanhui Road, 301700, Tianjin
China

WAGO Kontakttechnik GmbH & Co. KG
Hansastraße 27, 32423 Minden/Westfalen
Germany

WAGO Kontakttechnik GmbH & Co. KG, Werk Sondershausen
Waldstraße 1, 99706, Sondershausen
Germany

WAGO Contact S.A.
Route de l'Industrie 19, 1564, Domdidier
Switzerland

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
5.1	**MARKING**		
	Terminal block shall be marked with:		
	- manufacturer's name or trademark	WAGO	P
	- type designation	284/784	P
5.2	The following information shall be stated by the manufacturer if applicable, e.g. in the manufacturer's data sheet, or his catalogue or on the packing unit:		
	- manufacturer's claim for compliance with IEC 60 947-7-2	IEC 60947-7-2	P
	- rated cross-section	10 mm²	P
	- rated connecting capacity	In cataloque 0,2 mm² - 10 mm²	P
	- service conditions if different from those of Cl. 6.		N/A
	- PE function only if supplied with or intended for use only with steel in the current-carrying path		N/A
7.	**CONSTRUCTION**		
7.1	Constructional requirements		
7.1.1	Terminals		
	Terminals shall permit a reliable connection between the conductor clamping unit and the clamping unit to the support		P
7.1.7.1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength		P
	Clamping units connections shall be such that necessary contact pressure is maintained		P
	Clamping units shall be so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal		P

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	Clamping units shall not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operation of equipment and the insulation voltage shall not be reduced below the rated value		P
	Clamping units shall allow the conductor to be connected by means ensuring that a reliable mechanical linkage and electrical contact is properly maintained		P
	Clamping units shall be able to withstand the forces that can be applied through the connected conductors		P
	Contact pressure is not transmitted through insulation materials		P
7.1.2	Connection of support		
	Protective conductor terminal blocks are provided with means that allow them to be securely attached to the corresponding support without risk of galvanic corrosion		P
	The design of the protective conductor terminal blocks shall clearly show how the fixation has to be made to ensure the correct conducting connection to appropriate support		P
	The clamping connection to the support shall only be released by means of tools		P
7.1.3	Clearances and creepage distances		
	Clearances and creepage distances do not apply to protective conductor terminal blocks		P

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
7.1.4	Terminal identification and marking:		
	- terminal blocks shall have provision, or at least space, for identification marks or numbers for each terminal or terminal assembly to be related to the circuit of which it is to form a part		P
	- any partial insulated protective conductor terminal blocks shall be coloured green and yellow		P
7.1.5	Resistance to abnormal heat and fire		
	Needle flame test for insulation materials of terminal blocks (see 8.5)		P
7.1.6	Rated cross section and rated connecting capacity		
	Terminal blocks are so designed that conductors of the rated cross-section and/or the rated connecting capacity can be accepted	0,2 mm² - 10 mm² Flexible or rigid	P
7.1.7	Protective conductor mounting rails		
	Type of mounting rails .....:	EN 50022 (35 mm)	P
8.	**TESTS**		
8.3	Verification of mechanical characteristics		
8.3.2	Attachment of the terminal block on its support		
	mounting rail .....:	EN 50022 (35 mm)	—
	torque (Nm) clamping to support .....:		—
	steel pin diameter (mm) .....:	2,8 mm	—
	tightening torque clamping units (Nm) ..... :		—
	force (N) .....:	5 N	—
	During the test, no terminal block shall work free from its rail or support, nor suffer any other damage		P
8.3.3.1	Test of mechanical strength of clamping units **(type 784-607)**		
8.2.4.2	Mechanical strength of terminals (IEC 60947-1)		
	rated cross-section of a rigid conductor (mm²) ....:	10 mm²	—
	diameter of thread (mm) .....:		—

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	torque (Nm) .....:		—
	5 times on 2 separate clamping units		P
	Voltage drop before and after mechanical strength test		
	rated cross-section of a rigid conductor (mm²) ....:	10 mm²	—
	test current (A) d.c. .....:	5,7 A	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV .....:	1,42 mV - 1,64 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test .....:	1,56 mV - 1,79 mV	P
	minimum cross-section of a flexible conductor (mm²) .....:	0,2 mm²	—
	test current (A) d.c. .....:	0,4 A	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV .....:	1,19 mV - 1,26 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test .....:	1,25 mV - 1,34 mV	P
	Mechanical strength of the clamping to support		
	- rail profile .....:	EN 50022 (35 mm)	—
	diameter of thread (mm) .....:		—
	torque (Nm) .....:		—
	5 times on 2 separate clamping units		
	rated cross-section of a rigid conductor (mm²) ....:	10 mm²	—
	test current (A) d.c. .....:	5,7 A	—

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	voltage drop (mV) before mechanical strength test not exceeding 6,4 mV .....:	1,79 mV - 2,04 mV	P
	If the measured value exceeds 6,4 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 4,8 mV		N/A
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test .....:	1,84 mV - 2,06 mV	P
8.3.4.2	Testing for damage to and accidental loosening of conductors of a terminal block (flexion test)		
	conductor of the smallest cross-section (mm²) ...:	0,2 mm² rigid and flexible	—
	number of conductor of the smallest cross-section .....:	1	—
	torque (Nm) .....:		—
	diameter of bushing hole (mm) .....:	6,4 mm	—
	height between the equipment and the platen (mm) .....:	260 mm	—
	mass at the conductor(s) (kg) .....:	0,3 kg	—
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		
	force (N) .....:	10 N	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	conductor of the rated cross-section (mm²) .....:	10 mm² rigid and flexible	—
	number of conductor of the rated cross-section ..:	1	—
	torque (Nm) .....:		—
	diameter of bushing hole (mm) .....:	9,5 mm	—
	height between the equipment and the platen (mm) .....:	280 mm	—
	mass at the conductor(s) (kg) .....:	2,0 kg	—

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		
	force (N) .....:	90 N	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	conductor of the largest cross-section (mm²) .....:	10 mm² rigid and flexible	—
	number of conductor of the largest cross-section :	1	—
	torque (Nm) .....:		—
	diameter of bushing hole (mm) .....:	9,5 mm	—
	height between the equipment and the platen (mm) .....:	280 mm	—
	mass at the conductor(s) (kg) .....:	2,0 kg	—
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		
	force (N) .....:	90 N	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	conductor of the largest or smallest cross-section (mm²) .....:		—
	number of conductor of the largest or smallest cross-section .....:		—
	torque (Nm) .....:		—
	diameter of bushing hole (mm) .....:		—
	height between the equipment and the platen (mm) .....:		—
	mass at the conductor(s) (kg) .....:		—
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	Pull-out test		
	force (N) .....:		—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
8.3.4.4	Verification of rated cross section and rated connecting capacity		
	One conductor of the two next smaller cross-sections can be unhindered and connected in each clamping unit of one terminal block (up to 35 mm²)	4 mm²	P
8.4.3	Dielectric tests		
	Dielectric test, Uimp indicated:		
	- The test is made on protective terminal blocks installed with terminal blocks of the same series and size according to the manufactures instructions rated cross-section (mm²) / type / conductor end length (mm) .....:	Type 784-607 10 mm² / rigid / 10 mm	—
	- rated impulse withstand voltage (kV) .....:	8 kV	—
	- test Uimp main circuits (kV) .....:	9,8 kV	P
	Dielectric test, Uimp not indicated:		
	- The test is made on protective terminal blocks installed with terminal blocks of the same series and size according to the manufactures instructions rated cross-section (mm²) / type / conductor end length (mm) :	Type 784-607 10 mm² / rigid / 10 mm	—
	- rated insulation voltage (V) .....:	1000 V	—
	- test voltage for 5 sec (V) .....:	2200 V	P
8.4.5	Temperature-rise test		
	Temperature rise conditions:		
	- test current (A) .....:	57 A	—
	- cross-section of the conductor (mm²) .....:	10 mm²	—
	- torque (Nm) clamping unit .....:		—
	- torque (Nm) clamping to support .....:		—
	Temperature-ise without support		P

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	- temperature-rise does not exceed 45 K	40 K	P
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	5,7 A	—
	- voltage drop (mV) before temperature-rise test not exceeding 3,2 mV .....:	1,4 mV - 2,70 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature rise test .....:	1,50 mV - 2,70 mV	P
	Temperature-rise with support		
	- rail profile and material .....:	EN 50022 (35 mm) Cu	—
	- temperature-rise does not exceed 45 K .....:	Max. 21 K	—
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	5,7 A	—
	- voltage drop (mV) before temperature-rise test not exceeding 6,4 mV .....:	2,15 mV - 2,55 mV	P
	If the measured value exceeds 6,4 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 4,8 mV		N/A
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test .....:	2,2 mV- 2,6 mV	P
8.4.6	Short-time withstand current test		
	- cross-section of the conductor (mm²) .....:	10 mm²	—
	- torque (Nm) clamping unit .....:		—
	- rail profile and material .....:	EN 50022 (35 mm) Cu	—
	- torque (Nm) clamping to support .....:		—
	Test current from clamping unit to clamping unit (1-1)		
	- test current (A) .....:	1200 A	—

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Clause	Requirement – Test	Result - Remark	Verdict
	- duration of the test current (s) .....:	1 sec.	—
	At the end of the test, continuity shall exist on the test sample assembly and the terminal blocks shall not show any cracking, breakage or other critical damage		P
	Voltage drop after short-time withstand current test		
	- cross-section of the conductor (mm²) .....:	10 mm²	—
	- test current (A) d.c. .....:	5,7 A	—
	- voltage drop (mV) after short-time withstand current test not exceeding 3,2 mV .....:	1,6 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	Test current from clamping unit to support (2-2)		
	- test current (A) .....:	1200 A	—
	- duration of the test current (s) .....:	1 sec.	—
	At the end of the test, continuity shall exist on the test sample assembly and the terminal blocks shall not show any cracking, breakage or other critical damage		P
	Voltage drop after short-time withstand current test		
	- cross-section of the conductor (mm²) .....:	10 mm²	—
	- test current (A) d.c. .....:	5,7 A	—
	- voltage drop (mV) after short-time withstand current test not exceeding 6,4 mV .....:	1,9 mV -2,0 mV	P
	If the measured value exceeds 6,4 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 4,8 mV		N/A
8.4.7	Ageing test (for screwless-type terminal blocks only)		
	Maximum ambient temperature (°C) .....:	40 °C	—

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Clause	Requirement – Test	Result - Remark	Verdict
	Rated cross-section solid or stranded (mm²) .....:	10 mm² on request of the manufacturer test carried out with flexible	—
	Heating cabinet is increased, in each cycle to (°C) .....:	85 °C	—
	Test current (A) d.c. for measurement of the voltage drop .....:	5,7 A	—
	Rail profile and material .....:	EN 50022 (35 mm) Cu	—
	Torque (Nm) clamping to support .....:		—
	Voltage drop after 0 cycles:		
	- requirement for clamping unit to clamping unit: ≤ 3,2 mV (mV) .....:	1,23 mV - 2,38 mV	P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		N/A
	- requirement for clamping unit to support: ≤ 6,4 mV (mV) .....:	1,88 mV - 3,17 mV	P
	If the measured value exceeds 6,4 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 4,8 mV		N/A
	Voltage drop after the 24th cycle:		
	- requirement for clamping unit to clamping unit: 4,8 mV (mV) ..... :	1,18 mV - 2,6 mV	P
	- requirement for clamping unit to support: 9,6 mV (mV) ..... . :	1,85 mV - 3,33 mV	P
	Voltage drop after the 48th cycle		

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Clause	Requirement – Test	Result - Remark	Verdict
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,12 mV - 2,63 mV	P
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	2,04 mV - 3,3 mV	P
	Voltage drop after the 72nd cycle:		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,11 mV - 2,48 mV	P
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	2,04 mV - 3,25 mV	P
	Voltage drop after the 96th cycle:		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,09 mV - 2,29 mV	P
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,91 mV - 3,30 mV	P
	Voltage drop after the 120th cycle:		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,09 mV - 2,57 mV	P
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	2,21 mV - 3,45 mV	P
	Voltage drop after the 144th cycle:		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,09 mV - 2,74 mV	P
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	2,12 mV - 3,5 mV	P

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Clause	Requirement – Test	Result - Remark	Verdict
	Voltage drop after the 168th cycle:		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,07 mV - 2,26 mV	P
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,82 mV - 3,55 mV	P
	Voltage drop after the 192nd cycle:		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	1,07 mV - 2,51 mV	P
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	2,07 mV - 3,55 mV	P
	Pull-out test		
	force (N) .....:	90 N	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
8.5	Verification of thermal characteristics are checked by the needle flame test		P
	Before the test, the terminal blocks are stored for 24 h in an atmosphere having a temperature between 15°C and 35°C and a relative humidity between 45% and 75%		P
	The flame is applied for 10 s. for insulation walls <1 mm and / or an area < 100 mm², the flame is applied for 5 s.	5 sec.	P
	The terminal blocks are considered to have passed the test if the duration of burning is < 30s in case of ignition. Moreover, the tissue paper on the pinewood board shall not ignite if burning or glowing particles fall from the terminal block.		P
8.6	Verification of EMC characteristics		
	Subclause 8.4 of IEC 60947-1 applies with the following addition		N/A
8.6.1	Immunity		
	Terminal blocks within the scope of this standard are not sensitive of electromagnetic disturbances and therefore no immunity tests are necessary.		N/A
8.6.2	Emission		
	Terminal blocks within the scope of this standard do not generate electromagnetic disturbances and therefore no emission tests are necessary.		N/A

Remarks

Remarks

Description of the types

product data of rail mounted through terminal blocks

rated voltage	:	800 V
rated impulse withstand voltage	:	8 kV
types	:	284-... with suffixes -101, -103, -104, -191, -601, -604, -605, -691, -901, -902, -903, -904, -905, -906, -992
description	:	two-conductor through terminal block, 1-pole
types	:	284-... with suffixes -681, -682, -683, -684, -685, -686, -993
description	:	three-conductor through terminal block, 1-pole

product data of rail mounted earth terminal blocks

types	:	284-... with suffixes -107, -607, -907, -610, -107/999-950 -607/999-950, -907/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	284-... with suffixes -687, -687/999-950
description	:	three-conductor earth terminal block, 1-pole

product data of rail mounted terminal blocks

rated voltage	:	1000 V
rated impulse withstand voltage	:	8 kV
types	:	784-... with suffixes -601, -604, 992
description	:	two-conductor through terminal block, 1-pole

product data of rail mounted earth terminal blocks

types	:	784-... with suffixes -607, -607/999-950
description	:	two-conductor earth terminal block, 1-pole

product data of rail mounted neutral terminal blocks

rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
type	:	784-613
description	:	two-conductor through terminal block with neutral busbar connection of a busbar 3 x 10 mm, 1-pole

Remarks

