CERTIFICATE

Issued to:
Applicant:
Wago-Kontakttechnik GmbH & Co. KG
Hansastrasse 27
32423 Minden/westfalen, Germany

Manufacturer/Licensee:
Wago-Kontakttechnik GmbH & Co. KG
Hansastrasse 27
32423 Minden/westfalen, Germany

Product(s) : terminal blocks
Trade name(s) : WAGO
Type(s)/model(s) : 280

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

DEKRA hereby declares that the above-mentioned product has been certified on the basis of:
- a type test according to the standard EN 60947-7-1:2009;EN 60947-7-2:2009;
- an inspection of the production location according to CENELEC Operational Document CIG 021
- a certification agreement with the number 900220

DEKRA hereby grants the right to use the KEMA-KEUR certification mark.

The KEMA-KEUR certification mark may be applied to the product as specified in this certificate for the duration of the KEMA-KEUR certification agreement and under the conditions of the KEMA-KEUR certification agreement.

This certificate is issued on: 17 October 2012 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 2157201.01

DEKRA Certification B.V.

drs. G.J. Zoetbrood
Managing Director

F.S. Strikwerda
Certification Manager

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All testing, inspection, auditing and certification activities of the former KEMA Quality are an integral part of the DEKRA Certification Group.

ACCREDITED BY
THE DUTCH COUNCIL
FOR ACCREDITATION

PRODUCTS
RvA C 001

KEMA KEUR

types	:	280-... with suffixes -940/281-410, -940/281-411, -941/281-492 -941/281-941,-942/281-487, -942/281-488, -942/281-489, -942/281-490
rated voltage	:	250 V
description	:	double deck diode terminal block
types	:	280-... with suffixes -624/281-434, -624/281-413, -624/281-413
rated voltage	:	24 V
description	:	four-conductor LED terminal block
types	:	280-... with suffixes- 943/281-434, -943/281-413
rated voltage	:	24 V
description	:	double deck LED terminal block

Additional information
Markings
Trademark, type designation and complete electrical ratings are indented in the thermoplastic material.

TESTS

Test requirements
EN 60947-7-1:2009
EN 60947-7-2:2009

Test result
The test results are laid down in DEKRA test file 2157201.01.

Remarks
This certificate replaces certificate no. 2082859.07 dated 30 November, 2005.

Conclusion
The examination proved that all test requirements were met.

Tested by : W.C. van Ginkel

Checked by : H.L. Schendstok

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, Nodia 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

SPECIFICATION OF THE CERTIFIED PRODUCT

Product data

product	:	terminal blocks
trade name(s)	:	WAGO
type(s)	:	280
connection	:	screwless terminals for conductor cross sectional area of 0,08 mm² -2,5 mm² flexible or rigid
material	:	thermoplastic material, grey, light grey, dark grey, blue, orange, white, red, black, yellow and green/yellow
method of mounting	:	types 280-102, -103 and -105; for mounting on G-profile 32 mm (EN 50035) other types; for mounting on top hat rail 35 mm (EN 50022)

Product data of rail mounted through terminal blocks:

rated voltage	:	800 V
rated impulse withstand voltage	:	8 kV
types	:	280-... with suffixes -101, -102, -103, -104, -105, -601, -602, -691, -901, -902, -903, -904, -905, -906, -991, -992
description	:	two-conductor through terminal block, 1-pole
types	:	280-... with suffixes-641, -650, -651, -653, -654, -671, -672, -681, -684, -898, -993, -998
description	:	three-conductor through terminal block, 1-pole
types	:	280-... with suffixes-603, -604, -621, -633, -634, -646, -656, -699, -830, -831, -832, -833, -834, -835, -946, -990, -994, -996, -999
description	:	four-conductor through terminal block, 1-pole

Product data of a rail mounted earth terminal block

types	:	280-... with suffixes-107, -108, -607, -907, -107/999-950, 607/999-950,-907/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	280-... with suffixes-637, -687, -637/999-950, -687/999-950
description	:	three-conductor earth terminal block, 1-pole
types	:	280-... with suffixes-677, -837, -677/999-950
description	:	four-conductor earth terminal block, 1-pole

Product data of shield conductor terminal blocks:

type	:	280-640
description	:	three-conductor shield terminal block, 1-pole
types	:	280-... with suffixes-678, -838
description	:	four-conductor shield terminal block, 1-pole

Product data of double deck terminal blocks

types	:	280-... with suffixes -513, -519, -520, -523, -524, -529, -530, -533, -534, -539, -540, -541, -542, -543
rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	20 A
description	:	two-conductor through/through terminal block, 2-poles
types	:	280-... with suffixes -517, -527, -537
rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	20 A
description	:	two-conductor earth/through terminal block, 2-poles
types	:	280-... with suffixes -521, -522, -525, -526
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	two-conductor through/disconnect terminal block, 2-poles
types	:	280-... with suffixes-531, -532
rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	6,3 A / 20 A
description	:	two-conductor through/carrier terminal block, 2-poles

Product data of triple deck terminal blocks

rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	20 A
types	:	280-... with suffixes -510, -547, -557, -597
description	:	two-conductor earth/through/through terminal block, 3-poles
types	:	280-... with suffixes -548, -558
description	:	two-conductor shield/through/ through terminal block, 3-poles
types	:	280-... with suffixes -549, -550, -551, -552
description	:	two-conductor through/through/through terminal block, 3-poles

Product data of disconnect terminal block

types	:	280-... with suffixes -612, -627, -649, -912
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	two-conductor disconnect terminal block, 1-pole
types	:	280-683
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	three-conductor disconnect terminal block, 1-pole

types	:	280-... with suffixes -874, -881, -883, -885
rated voltage	:	250 V
rated impulse withstand voltage	:	4 kV
rated current	:	16 A
description	:	two-conductor disconnect terminal block, 1-pole
types	:	280-... with suffixes -870, -868, -876, -879
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	16 A
description	:	two conductor disconnect terminal block, 1-pole
types	:	280-... with suffixes -869, -871, -875, -880, -882, -884
rated voltage	:	250 V
rated impulse withstand voltage	:	4 kV
rated current	:	16 A
description	:	two- and four conductor disconnect terminal block with shield
types	:	280-... with suffixes -622, -685, -676, -695
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	four-conductor disconnect terminal block, 1-pole

Product data of carrier terminal blocks

types	:	280-... with suffixes -616, -916
description	:	two-conductor carrier terminal block, 1-pole
types	:	280-610
description	:	three-conductor carrier terminal block, 1-pole
types	:	280-... with suffixes -606, -686
description	:	four-conductor carrier terminal block, 1-pole

Product data of double potential terminal blocks

types	:	280-... with suffixes -626, -826, -989, -995
rated voltage	:	800 V
rated impulse withstand voltage	:	8 kV
description	:	four-conductor double potential terminal block, 1-pole

Product data of diode, LED and variable resistor terminal blocks

types	:	280-... with suffixes -613, -915, -673, -623, -655 and additional suffixes/281-410, /281-411
rated voltage	:	250 V
description	:	2 and four conductor diode terminal block
types	:	280-... with suffixes -615/281-412, -645/281-412 -615/281-428
rated voltage	:	250 V
description	:	variable resistor terminal block

CERTIFICATE

Issued to:
Applicant:
Wago-Kontakttechnik GmbH & Co. KG
Hansastrasse 27
32423 Minden/westfalen, Germany

Manufacturer/Licensee:
Wago-Kontakttechnik GmbH & Co. KG
Hansastrasse 27
32423 Minden/westfalen, Germany

Product(s) : terminal blocks
Trade name(s) : WAGO
Type(s)/model(s) : 780

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

DEKRA hereby declares that the above-mentioned product has been certified on the basis of:
- a type test according to the standard EN 60947-7-1:2009;EN 60947-7-2:2009;
- an inspection of the production location according to CENELEC Operational Document CIG 021
- a certification agreement with the number 900220

DEKRA hereby grants the right to use the KEMA-KEUR certification mark.

The KEMA-KEUR certification mark may be applied to the product as specified in this certificate for the duration of the KEMA-KEUR certification agreement and under the conditions of the KEMA-KEUR certification agreement.

This certificate is issued on: 17 October 2012 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 2157201.02

DEKRA Certification B.V.

drs. G.J. Zoetbrood
Managing Director

F.S. Strikwerda
Certification Manager

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PRODUCTS
RvA C 001

KEMA KEUR

SPECIFICATION OF THE CERTIFIED PRODUCT

Product data

type	:	780-...
tradename	:	WAGO
connection	:	screwless terminals for conductor cross sectional area of 0,08 mm^2 - 2,5 mm^2 flexible or rigid
material	:	thermoplastic material; grey, light grey, dark grey, blue, orange, white, red, black, yellow and green/yellow
method of mounting	:	for mounting on top hat rail 35 mm (EN 50022)

Product data of rail mounted through terminal blocks

rated voltage	:	1000 V
rated impulse withstand voltage	:	8 kV
types	:	780-... with suffixes -601, -602, -604, -992
description	:	two-conductor through terminal block, 1-pole
types	:	780-... with suffixes -631, -651, -654, -993
description	:	three-conductor through terminal block, 1-pole

Product data of a rail mounted earth terminal block

types	:	780-... with suffixes -607, -607/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	780- with suffixes -637, -640, -677, -637/999-950
description	:	three-conductor earth terminal block, 1-pole

Product data of a rail mounted neutral terminal block

rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
type	:	780-613
description	:	two conductor through terminal block with neutral busbar connection of a busbar 3 x 10 mm, 1-pole

Additional information

Markings

Trademark, type designation and complete electrical ratings are indented in the thermoplastic material.

TESTS

Test requirements

EN 60947-7-1:2009

EN 60947-7-2:2009

Test result

The test results are laid down in DEKRA test file 2157201.02.

Remarks
This certificate replaces certificate no. 2082859.08 dated 30 November, 2005.

Conclusion
The examination proved that all test requirements were met.

Tested by : W.C. van Ginkel

Checked by : H.L. Schendstok

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, Nodia 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
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WAGO Kontakttechnik GmbH &Co. KG, Werk Sondershausen
Waldstrasse 1, 99706, Sondershausen
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WAGO Contact S.A.
Route de l'Industrie 19, 1564, Domdidier
Switzerland

Test Report issued under the responsibility of:

DEKRA

TEST REPORT
EN 60947-7-1
Low-voltage switchgear and controlgear
Part 7: Ancillary equipment

Section One: Terminal blocks for copper conductors

Report Reference No.....:	***2157201.50***
Date of issue.....:	***17 October, 2012***
Total number of pages .....:	***42 pages***
CCA Testing Laboratory .....:	***DEKRA Certification B.V.***
Address .....:	***Utrechtseweg 310, 6812 AR Arnhem, The Netherlands***
Applicant's name.....:	***WAGO Kontakttechnik GmbH & Co. KG***
Address .....:	***Hansastrasse 27, Minden, Germany***
Test specification:	
Standard .....:	EN 60947-7-1:2009
Test procedure .....:	CB / CCA Scheme
Non-standard test method……..:	N/A
Test Report Form No.....:	EN 60947_7_1 B
Test Report Form(s) Originator .....:	DEKRA Certification B.V.
Master TRF.....:	Dated 2009-06

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Test item description .....:	***rail mounted terminal block***
Trade Mark .....:	***WAGO***
Model/Type reference.....:	***780 and 280***
Ratings .....:	**type 280: 2,5 mm², 24 V – 800 V**
	type 780: 2,5 mm², 400 V – 1000 V
Manufacturer	***WAGO Kontakttechnik GmbH & Co. KG***
Factory location .....:	**WAGO Kontakttechnik GmbH & Co.KG** **Hansastrasse 27; 32425 Minden ,Germany**
	See complete view of factory locations: General product information on page 5

Testing procedure and testing location:	
☒ **CCA Testing Laboratory**:	**DEKRA Certification B.V.**
Testing location/ address.....:	**Utrechtseweg 310, 6812 AR Arnhem, The Netherlands**
☐ **Associated CCA Laboratory:**	
Testing location/ address.....:	
Tested by (name + signature).....:	***W.C. 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: Complete investigation	
Tests performed (name of test and test clause): **Complete investigation**	**Testing location:** ***DEKRA Certification B.V.*** ***Utrechtseweg 310, 6812 AR Arnhem,*** ***The Netherlands***
Summary of compliance with National Differences:	
Copy of marking plate **WAGO** **280** **WAGO** **780**	

Test item particulars ..... :	
Classification of installation and use ..... :	
Supply Connection..... :	
..... :	
..... :	
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 ..... :	***09-2012***
Date (s) of performance of tests ..... :	***09-2012***

General remarks:

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.

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 780-601, 780-613, 280-101 and 280-601.

Additional tests are carried out on 280-552, 280-597, 280-610 280-621, 280-624/281-434, 280-646, 280-652, 280-675, 280-683, 280-685, 280-686, 280-870, 280-874 and 280-875.

The earth level on double and triple deck terminal blocks is given in TRF no.2157201.51

This TRF replaces TRF 2082859.63

General product information:

see page 40 up to and including 42 for description

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, Nodia 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

Particulars: test item vs. test requirements

- method of fixing	***top hat rail 35 mm (EN 50022)***
- number of poles	***1-pole – 3-poles***
- type of clamping units	***screwless-type terminal***
- ability to receive conductors	***unprepared conductors, flexible or rigid***
- number of terminals on terminal assembly	***2 - 4***
- rated cross-section (mm²)	***2,5 mm***
- rated connecting capacity (mm²)	***0,08 mm² - 2,5 mm ²(rigid or flexible)***
- rated insulation voltage (Ui)	***type: 280: 24 V -800 V***
	type: 780: 400 V -1000 V
- rated impulse withstand voltage (Uimp)	***4 kV, 6 kV and 8 kV***
- Conventional free air thermal current (Ith)	***10 A, 16 A and 24 A***

EN 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	**280 or 780**	**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 EN 60 947-7-1	***IEC 947-7-1***	***P***
	- rated cross-section	***2,5 mm²***	***P***
	- rated connecting capacity	***in catalogue 0,08 - 2,5 mm²***	***P***
	- rated insulation voltage (Ui)	***24 V – 1000 V***	***P***
	- rated impulse withstand voltage (Uimp)	***in catalogue 4 k, 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***

EN 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	***blue***	***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	***0,08 mm² - 2,5 mm²*** ***rigid or flexible***	***P***
8	**TESTS**		

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
8.3	Verification of mechanical characteristics		
8.3.2	Attachment of the terminal block on its support		
	mounting rail ..... :	***EN 50 022 (35 mm)***	—
	Tighting torque (Nm) ..... :	**-**	—
	steel pin diameter (mm) ..... :	***1 mm***	—
	force (N) ..... :	***1 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 strenght of clamping units		
8.2.4.1	Mechanical strength of clamping units (EN 60947-1)		
	rated cross-section of a rigid conductor (mm²) .... :	***2,5 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) .... :	**2,5 mm²**	—
	test current (A) d.c. ..... :	**2,4 A**	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV ..... :	***1,32 mV – 2,06 mV***	***P***
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit seperately, 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 :	***1,30 mV – 2,23 mV***	***P***
	minimum cross-section of a flexible conductor (mm²) ..... :	**0,08 mm²**	—
	test current (A) d.c. ..... :	**0,1 A**	—

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV .....:	***0,38 mV - 0,80 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 .....:	***0,40 mV - 0,85 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) ....:	***0,08 mm² (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) .....:	***0,1 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) .....:	**4 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) .....:	***2,5 mm² (rigid / flexible)***	—
	number of conductors of the rated cross-section :	***1***	—
	diameter of bushing hole (mm) .....:	***9,5 mm***	—
	height between the equipment and the platen (mm) .....:	***279 mm***	—
	mass at the conductor(s) (kg) .....:	***0,7 kg***	—

EN 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		***P***
	Pull-out test		
	force (N) ..... :	***50 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) ..... :	***2,5 mm² (rigid / flexible)***	—
	number of conductors of the largest cross-section:	***1***	—
	diameter of bushing hole (mm) ..... :	***9,5 mm***	—
	height between the equipment and the platen (mm) ..... :	***279 mm***	—
	mass at the conductor(s) (kg) ..... :	***0,7***	—
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		***P***
	Pull-out test		
	force (N) ..... :	***50 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) ..... :		—
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		***N/A***

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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**
8.3.3.4	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)	***1 mm²***	***P***
8.4.2	Verification of clearances and creepage distances		
	Conductor type and conductor cross-section		—
	Conductor end length (mm)		—
	Type of support		—
8.4.2.2	Clearances		
	Case A (mm) ..... : Case B (mm) ..... : Measured (mm) ..... :	***3 mm / 5,5 mm / 8 mm*** ***1,2 mm / 2 mm / 3 mm***	***P***
	Rated impulse withstand voltage Uimp (kV)	**4 kV / 6 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) ..... :	***250 V, 400 V, 500 V, 800 V and 1000 V***	—
	- minimum creepage distances (mm) ..... :	***250 V: 3,2 mm*** ***400 V: 5,0 mm*** ***500 V: 6,3 mm*** ***800 V: 10 mm*** ***1000 V: 12,5 mm***	—
	- measured creepage distances (mm) ..... :	***250 V: > 5,6 mm*** ***400 V: > 11,14 mm*** ***500 V: > 7,72 mm*** ***800 V: > 11,4 mm*** ***1000 V: > 12,5 mm***	—
8.4	Verification of electrical characteristics		

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Clause	Requirement – Test	Result - Remark	Verdict
8.4.3	Dielectric tests		
	Dielectric test, Uimp indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm) .....:	***2,5 mm² rigid***	—
	- rated impulse withstand voltage (kV) .....:	***4 kV, 6 kV, 8 kV***	—
	- test Uimp main circuits (kV) .....:	***4,9 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) :	***2,5 mm² rigid***	—
	- rated insulation voltage (V) .....:	***250 V, 400 V, 500 V 800 V or 1000 V***	—
	- test voltage for 5 sec (V) .....:	***2000 V, 2500 V, 2500 V or 3000 V or 3500 V***	**P**
8.4.5	Temperature-rise test		
	Temperature-rise conditions: **on through terminal blocks**		
	- test current (A) .....:	***24 A***	—
	- cross-section of the conductor (mm²) .....:	***2,5 mm²***	—
	- torque (Nm) .....:	**-**	—
	- temperature-rise does not exceed 45 K	***max. 40 K***	**P**
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	**24 A**	—
	- voltage drop (mV) before temperature-ise test not exceeding 3,2 mV .....:	***1,00 mV - 2,45 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 .....:	***1,11 mV – 2,40 mV***	***P***
8.4.5	Temperature-rise test		

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Clause	Requirement – Test	Result - Remark	Verdict
	Temperature-rise conditions: **on triple deck terminal blocks (280-552)**		
	- test current (A) .....:	***20 A***	—
	- cross-section of the conductor (mm²) .....:	***2,5 mm²***	—
	- torque (Nm) .....:	**-**	—
	- temperature-rise does not exceed 45 K	***30 K – 36 K K***	**P**
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	**2,4 A**	—
	- voltage drop (mV) before temperature-ise test not exceeding 3,2 mV .....:	***1,40 mV – 3,14 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 .....:	***1,40 mV – 3,21 mV***	***P***
8.4.6	Short-time withstand current test **(on through terminal blocks)**		
	- rated cross-section of the conductor (mm²) .....:	***2,5 mm²***	—
	- torque (Nm) .....:	**-**	—
	- test current (A) .....:	***300 A***	—
	- duration of the test current (s) .....:	***1 s***	—
	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. .....:	**2,4 A**	—
	- voltage drop (mV) before short-time withstand current test not exceeding 3,2 mV .....:	***0,85 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***

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Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) after short-time withstand current test not exceeding 150% of the value measured before short-time withstand current test .....:	***1,00 mV – 2,60 mV***	***P***
8.4.7	Ageing test (for screwless-type terminal blocks only)		
	Maximum ambient temperature (°C) .....:	**40 °C**	—
	Rated cross-section rigid or stranded < 10 mm² solid, > 10 mm² stranded (mm²) .....:	***2,5 mm² on request of manufacturer test carried out with flexible***	—
	Test current (A) according 8.4.5 .....:		—
	Heating cabinet is increased, in each cycle to (°C) .....:	***40° C***	—
	Test current (A) d.c. for measurement of the voltage drop .....:	***2,4 A***	—
	Voltage drop after 0 cycles:		
	- requirement: ≤ 3,2 mV (mV) .....:	***1,24 mV – 2,51 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) .....:	**1,20 mV – 2,94 mV**	***P***
	Voltage drop after the 48th cycle		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,22 mV – 2,99 mV**	***P***
	Voltage drop after the 72th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,19 mV – 2,89 mV**	***P***
	Voltage drop after the 96th cycle:		

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Clause	Requirement – Test	Result - Remark	Verdict
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,18 mV – 2,92 mV**	***P***
	Voltage drop after the 120th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,17 mV – 2,92 mV**	***P***
	Voltage drop after the 144th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,18 mV – 2,91mV**	***P***
	Voltage drop after the 168th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,20 mV – 2,84 mV**	***P***
	Voltage drop after the 192th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,15 mV – 2,76 mV**	***P***
	Pull-out test		
	force (N) .....:	**50 N**	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		***P***
8.4.7	Ageing test (for screwless-type terminal block **on terminal blocks for pluggable modules 10 A (280-610 and 280-686) (test arrangement with empty component plug housing)**		
	Maximum ambient temperature (°C) .....:	**40 °C *I***	—
	Rated cross-section rigid or stranded < 10 mm² solid, > 10 mm² stranded (mm²) .....:	***2,5 mm² on request of 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 .....:	***1,0 A***	—
	Voltage drop after 0 cycles:		

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Clause	Requirement – Test	Result - Remark	Verdict
	- requirement: ≤ 3,2 mV (mV) .....:	**1,09 mV – 1,60 m**	***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) .....:	**1,09 mV – 1,58 mV**	***P***
	Voltage drop after the 48th cycle		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,34 mV – 1,68 mV**	***P***
	Voltage drop after the 72th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,21 mV – 1,54 mV**	***P***
	Voltage drop after the 96th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,20 mV – 1,59 mV**	***P***
	Voltage drop after the 120th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,20 mV – 1,54 mV**	***P***
	Voltage drop after the 144th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,21 mV – 1,56 mV**	***P***
	Voltage drop after the 168th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,25 mV – 1,57 mV**	***P***
	Voltage drop after the 192th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,12 mV – 1,50 mV**	***P***

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Clause	Requirement – Test	Result - Remark	Verdict
	Pull-out test		
	force (N) ..... :	**50 N**	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		***P***
8.4.7	Ageing test (for screwless-type terminal blocks **on terminal blocks for matrix patching 18 A (280-675)**		
	Maximum ambient temperature (°C) ..... :	**40 °C**	—
	Rated cross-section rigid or stranded < 10 mm² solid, > 10 mm² stranded (mm²) ..... :	***2,5 mm² on request of manufacturer test carried out with flexible***	—
	Test current (A) according 8.4.5 ..... :		—
	Heating cabinet is increased, in each cycle to (°C) ..... :	***40° C***	—
	Test current (A) d.c. for measurement of the voltage drop ..... :	***1,8 A***	—
	Voltage drop after 0 cycles:		
	- requirement: ≤ 3,2 mV (mV) ..... :	***1,58 mV – 1,70 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 after the 24th cycle:		
	- requirement: 4,8 mV (mV) ..... :	**1,55 mV – 1,71 mV**	***P***
	Voltage drop after the 48th cycle		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,51 mV – 1,67 mV**	***P***
	Voltage drop after the 72th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,48 mV – 1,65 mV**	***P***

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Clause	Requirement – Test	Result - Remark	Verdict
	Voltage drop after the 96th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,49 mV – 1,66 mV**	***P***
	Voltage drop after the 120th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,51 mV – 1,69 mV**	***P***
	Voltage drop after the 144th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,55 mV – 1,72 mV**	***P***
	Voltage drop after the 168th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,56 mV – 1,72 mV**	***P***
	Voltage drop after the 192th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,49 mV – 1,64 mV**	***P***
	Pull-out test		
	force (N) .....:	**50 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 are checked by the needle flame test.		
	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 s***	***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		***P***

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Clause	Requirement – Test	Result - Remark	Verdict
	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 EN 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**		
Annex B	**informative**		
	Items subject to agreement between manufacturer and user		
Annex C	**vacant**		
Annex D	**ADDITIONAL REQUIREMENTS FOR TEST DISCONNECT TERMINALBLOCKS**		
D5	Product information		
	- service life in number of cycles	***200***	***P***
D6.	Normal service, mounting and transport conditions		
	Clause 6 applies.		***P***
D7	Construction and performance conditions		
	Clause 7 applies with the following additions		
D7.1	Constructional requirements		
D7.1.3	Clearances and creepages are not required to be		***P***

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Clause	Requirement – Test	Result - Remark	Verdict
	measured over the open disconnect contacts (Gap). However, the rated impulse withstand voltage (Uimp) stated by the manufacturer according to table 13 of EN 60947-1, without using the altitude correction factor, shall be verified across the open disconnect contacts (gap) (see D.7.2.2)		
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)	***Type*** ***280-685: Plug*** ***280-874: Knife*** ***780-613: Slide for busbar*** ***280-870: Knife*** ***280-683: Plug***	***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 **Type *280-685***		
	Dielectric test, Uimp indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length tested over open disconnect contacts (gap) (mm) :	***2,5 mm$^{2;}$ solid;***	—
	- rated impulse withstand voltage (kV) .....:	***6 kV***	—
	- test Uimp without altitude correction factor (kV) :	***6 kV***	***P***
	Dielectric properties **Type *280-874***		
	Dielectric test, Uimp indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length tested over open disconnect contacts (gap) (mm) :	***2,5 mm$^{2;}$ solid;***	—
	- rated impulse withstand voltage (kV) .....:	***6 kV***	—

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Clause	Requirement – Test	Result - Remark	Verdict
	- test Uimp without altitude correction factor (kV) :	***6 kV***	***P***
D.7.2.2	Dielectric properties **Type *780-613***		
	Dielectric test, Uimp indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length tested over open disconnect contacts (gap) (mm) :	***2,5 mm$^{2;}$ solid;***	—
	- rated impulse withstand voltage (kV) .....:	***6 kV***	—
	- test Uimp without altitude correction factor (kV) :	***6 kV***	***P***
D.7.2.2	Dielectric properties **Type *280-870***		
	Dielectric test, Uimp indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length tested over open disconnect contacts (gap) (mm) :	***2,5 mm$^{2;}$ solid;***	—
	- rated impulse withstand voltage (kV) .....:	***6 kV***	—
	- test Uimp without altitude correction factor (kV) :	***6 kV***	***P***
D.7.2.2	Dielectric properties **Type *280-683***		
	Dielectric test, Uimp indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length tested over open disconnect contacts (gap) (mm) :	***2,5 mm$^{2;}$ solid;***	—
	- rated impulse withstand voltage (kV) .....:	***6 kV***	—
	- test Uimp without altitude correction factor (kV) :	***6 kV***	***P***
D.8.4.5	Temperature-rise test ***Type 280-685***		
	Temperature-rise conditions:		
	- test current (A) .....:	***10 A***	—
	- cross-section of the conductor (mm²) .....:	***2,5 mm^2***	—
	- torque (Nm) .....:	***-***	—
	- torque disconnect unit (Nm) .....:	***-***	—
	- temperature-rise does not exceed 45 K	***7 K - 10 K***	***P***
	Voltage drop before and after temperature-rise test:		

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Clause	Requirement – Test	Result - Remark	Verdict
	- test current (A) d.c. ..... :	***2,4 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 ..... :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***2,8 mV – 3,8 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 ..... :	***3,3 mV – 3,8 mV***	***P***
D.8.4.5	Temperature-rise test ***Type 280-874***		
	Temperature-rise conditions:		
	- test current (A) ..... :	***16 A***	—
	- cross-section of the conductor (mm²) ..... :	***2,5 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- torque disconnect unit (Nm) ..... :	***-***	—
	- temperature-rise does not exceed 45 K	***17 K - 22 K***	***P***
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. ..... :	***2,4 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 ..... :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***3,1 mV – 3,5 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***

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Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test .....:	***3,2 mV – 3,3 mV***	***P***
D.8.4.5	Temperature-rise test ***Type 780-613***		
	Temperature-rise conditions:		
	- test current (A) .....:	***24 A***	—
	- cross-section of the conductor (mm²) .....:	***2,5 mm²***	—
	- torque (Nm) .....:	***-***	—
	- torque disconnect unit (Nm) .....:	***-***	—
	- temperature-rise does not exceed 45 K	***23 K - 43 K***	***P***
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	***2,4 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 .....:	***Required*** ***3 x 1,6 mV = 4,8 mV*** ***Measured:*** ***1,81 mV – 2,71 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 .....:	***1,87 mV – 2,22 mV***	***P***
D.8.4.5	Temperature-rise test ***Type 280-870***		
	Temperature-rise conditions:		
	- test current (A) .....:	***16 A***	—
	- cross-section of the conductor (mm²) .....:	***2,5 mm²***	—
	- torque (Nm) .....:	***-***	—
	- torque disconnect unit (Nm) .....:	***-***	—
	- temperature-rise does not exceed 45 K	***16 K - 21 K***	***P***

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Clause	Requirement – Test	Result - Remark	Verdict
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	***2,4 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 .....:	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***2,6 mV – 2,9 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 .....:	***2,6 mV – 3,0 mV***	***P***
D.8.4.5	Temperature-rise test ***Type 280-683***		
	Temperature-rise conditions:		
	- test current (A) .....:	***10 A***	—
	- cross-section of the conductor (mm²) .....:	***2,5 mm²***	—
	- torque (Nm) .....:	***-***	—
	- torque disconnect unit (Nm) .....:	***-***	—
	- temperature-rise does not exceed 45 K	***7 K - 12 K***	***P***
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:	***2,4 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 .....:	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***2,2 mV – 3,1 mV***	***P***

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Clause	Requirement – Test	Result - Remark	Verdict
	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 .....:	***2,1 mV – 3,5 mV***	***P***
D.8.4.6	Short-time withstand current test ***Type 280-685***		
	- rated cross-section of the conductor (mm²) .....:	***1 mm²***	—
	- torque (Nm) .....:	**-**	—
	- torque disconnect unit (Nm) .....:	**-**	—
	- test current (A) .....:	***120 A***	—
	- duration of the test current (s) .....:	***1 s***	—
	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. .....:	**1,35 A**	—
	- voltage drop (mV) before short-circuit test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***1,91 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***

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Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) after short-circuit test not exceeding 150% of the value measured before short-circuit test ..... :	***2,08 mV***	***P***
D.8.4.6	Short-time withstand current test ***Type 280-874***		
	- rated cross-section of the conductor (mm²) ..... :	***1,5 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- torque disconnect unit (Nm) ..... :	***-***	—
	- test current (A) ..... :	***180 A***	—
	- duration of the test current (s) ..... :	***1 s***	—
	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. ..... :	***1,75 A***	—
	- voltage drop (mV) before short-circuit test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***2,2 mV – 3,1 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 short-circuit test not exceeding 150% of the value measured before short-circuit test ..... :		***P***
D.8.4.6	Short-time withstand current test ***Type 780-613***		
	- rated cross-section of the conductor (mm²) ..... :	***2,5 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- torque disconnect unit (Nm) ..... :	***-***	—
	- test current (A) ..... :	***320 A***	—

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- duration of the test current (s) .....:	***1 s***	—
	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. .....:		—
	- voltage drop (mV) before short-circuit test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points :	***Required*** ***3 x 1,6 mV = 4,8 mV*** ***Measured:*** ***1,92 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 short-circuit test not exceeding 150% of the value measured before short-circuit test .....:	***2,16 mV***	***P***
D.8.4.6	Short-time withstand current test ***Type 280-870***		
	- rated cross-section of the conductor (mm²) .....:	***1,5 mm²***	—
	- torque (Nm) .....:	***-***	—
	- torque disconnect unit (Nm) .....:	***-***	—
	- test current (A) .....:	***180 A***	—
	- duration of the test current (s) .....:	***1 s***	—
	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. .....:	***1,75 A***	—

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) before short-circuit test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***2,43 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 short-circuit test not exceeding 150% of the value measured before short-circuit test .....:	***2,40 mV***	***P***
D.8.4.6	Short-time withstand current test ***Type 280-683***		
	- rated cross-section of the conductor (mm²) .....:	***1,0 mm²***	—
	- torque (Nm) .....:	***-***	—
	- torque disconnect unit (Nm) .....:	***-***	—
	- test current (A) .....:	***120 A***	—
	- duration of the test current (s) .....:	***1 s***	—
	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. .....:	***1,35 A***	—
	- voltage drop (mV) before short-circuit test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***2,51 mV***	***P***

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	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 short-circuit test not exceeding 150% of the value measured before short-circuit test .....:	***3,25 mV***	***P***
D.8.4.7	Ageing test for test disconnect terminal blocks with screwless-type clamping units ***Covered by clause 8.4.7***		***P***
	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	1 - 2 - 3 - 4 - 5 -	***N/A***
	Voltage drop after the 24th cycle:		
	- requirement: 2,4 mV (mV) .....:	1 - 2 - 3 - 4 - 5 -	***N/A***

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Voltage drop after the 48th cycle		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:	1 - 2 - 3 - 4 - 5 -	***N/A***
	Voltage drop after the 72th cycle:		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:	1 - 2 - 3 - 4 - 5 -	***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) .....:	1 - 2 - 3 - 4 - 5 -	***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) .....:	1 - 2 - 3 - 4 - 5 -	***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) .....:	1 - 2 - 3 - 4 - 5 -	***N/A***
	Voltage drop after the 168th cycle:		

EN 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) .....:	1 - 2 - 3 - 4 - 5 -	***N/A***
	Voltage drop after the 192th cycle:		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) .....:	1 - 2 - 3 - 4 - 5 -	***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 ***Type 280-685***		
	- rated cross-section of the conductor (mm²) .....:	***2,5 mm²***	—
	- torque (Nm) .....:	***-***	—
	- torque disconnect unit (Nm) .....:	***-***	—
	- number of operating cycles .....:	***200***	—
	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. .....:	***2,4 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 :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***2,71 mV – 3,4 mV***	**P**

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	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 .....:	**2,85 mV - 3,27 mV**	**P**
D.8.5.1	Service life ***Type 280-874***		
	- rated cross-section of the conductor (mm²) .....:	***2,5 mm²***	—
	- torque (Nm) .....:	**-**	—
	- torque disconnect unit (Nm) .....:	**-**	—
	- number of operating cycles .....:	***200***	—
	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. .....:	***2,4 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 :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***3,1 mV – 3,3 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 .....:	**3,48 mV – 3,92 mV**	**P**
D.8.5.1	Service life ***Type 780-613***		
	- rated cross-section of the conductor (mm²) .....:	***2,5 mm²***	—

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- torque (Nm) ..... :	**-**	—
	- torque disconnect unit (Nm) ..... :	**-**	—
	- number of operating cycles ..... :	***200***	—
	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. ..... :	***2,4 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 :	***Required*** ***3 x 1,6 mV = 4,8 mV*** ***Measured:*** ***1,9 mV – 2,1 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 ..... :	**1,64 mV – 2,82 mV**	**P**
D.8.5.1	Service life ***Type 280-870***		
	- rated cross-section of the conductor (mm²) ..... :	***2,5 mm²***	—
	- torque (Nm) ..... :	**-**	—
	- torque disconnect unit (Nm) ..... :	**-**	—
	- number of operating cycles ..... :	***200***	—
	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. ..... :	***2,4 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 :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***2,1 mV – 2,9 mV***	**P**

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	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 .....:	**3,04 mV – 3,71 mV**	**P**
D.8.5.1	Service life ***Type 280-683***		
	- rated cross-section of the conductor (mm²) .....:	***2,5 mm²***	—
	- torque (Nm) .....:	**-**	—
	- torque disconnect unit (Nm) .....:	**-**	—
	- number of operating cycles .....:	***200***	—
	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. .....:	***2,4 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 :	***Required*** ***4 x 1,6 mV = 6,4 mV*** ***Measured:*** ***2,6 mV – 3,2 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 .....:	**3,36 mV – 4,12 mV**	**P**
8.6.2	Emission		

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Terminal blocks within the scope of this standard do not generate electromagnetic disturbances and therefore no emission tests are necessary.		***P***

Remarks

Additional test for terminal blocks provided with indicator lights

Construction:
The indicator light (LED) is not be removable.
The power dissipation in normal use in the series resistor exceed not the rated power dissipation, see table below.

type	*rated voltage (V)*	*power dissipation (W)*	
		DC	*AC*
280-624/281-434	*24*	*0,117*	*-*

Dielectric test
The indicator light-circuit was subjected, for 1 second, to an ac voltage equal to twice the rated voltage of the indicator light. No flashover or breakdown occurs, and neither the lamp nor its resistor was defective.

Temperature-rise test (normal)
The indicator light was connected to 1,06 times the rated voltage until steady temperature was reached. The maximum measured temperature-rise was 17 K.

Temperature-rise test (abnormal)
The indicator light was connected to the rated voltage until steady temperature was reached. The LED was short-circuit, because the clearances and creepage distances of the indicator light are smaller than the required distances in the EN 60947-1. The maximum measured temperature-rise was 14 K.

Remarks

Description of types:

Product data of rail mounted through terminal blocks:

rated voltage	:	800 V
rated impulse withstand voltage	:	8 kV
types	:	280-... with suffixes -101, -102, -103, -104, -105, -601, -602, -691, -901, -902, -903, -904, -905, -906, -991, -992
description	:	two-conductor through terminal block, 1-pole
types	:	280-... with suffixes -641, -650, -651, -653, -654, -671, -672, -681, -684, -898, -993, -998
description	:	three-conductor through terminal block, 1-pole
types	:	280-... with suffixes -603, -604, -621, -633, -634, -646, -656, -699, -830, -831, -832, -833, -834, -835, -946, -990, -994, -996, -999
description	:	four-conductor through terminal block, 1-pole

Product data of a rail mounted earth terminal block::

types	:	280-... with suffixes -107, -108, -607, -907, -107/999-950, 607/999-950, -907/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	280-... with suffixes -637, -687, -637/999-950, -687/999-950
description	:	three-conductor earth terminal block, 1-pole
types	:	280-... with suffixes -677, -837, -677/999-950
description	:	four-conductor earth terminal block, 1-pole

product data of shield conductor terminal blocks:

type	:	280-640
description	:	three-conductor shield terminal block, 1-pole
types	:	280-... with suffixes -678, -838
description	:	four-conductor shield terminal block, 1-pole

Remarks

Product data of double deck terminal blocks:

types	:	280-... with suffixes -513, -519, -520, -523, -524, -529, -530, -533, -534, -539, -540, -541, -542, -543
rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	20 A
description	:	two-conductor through/through terminal block, 2-poles
types	:	280-... with suffixes -517, -527, -537
rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	20 A
description	:	two-conductor earth/through terminal block, 2-poles
types	:	280-... with suffixes -521, -522, -525, -526
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	two-conductor through/ disconnect terminal block, 2-poles
types	:	280-... with suffixes -531, -532
rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	6,3 A / 20 A
description	:	two-conductor through/carrier terminal block, 2-poles

Product data of triple deck terminal blocks:

rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	20 A
types	:	280-... with suffixes -510, -547, -557, -597
description	:	two-conductor earth/through/ through terminal block, 3-poles
types	:	280-... with suffixes -548, -558
description	:	two-conductor shield/through/ through terminal block, 3-poles
types	:	280-... with suffixes -549, -550, -551, -552
description	:	two-conductor through/through/ through terminal block, 3-poles

Remarks

Product data of discon nect terminal block:

types	:	280-... with suffixes -612, -627, -649, -912
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	two-conductor disconnect terminal block, 1-pole
types	:	280-683
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	three-conductor disconnect terminal block, 1-pole
types	:	280-... with suffixes -874, -881, -883, -885
rated voltage	:	250 V
rated impulse withstand voltage	:	4 kV
rated current	:	16 A
description	:	two-conductor disconnect terminal block, 1-pole
types	:	280-... with suffixes -870, -868, -876, -879
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	16 A
description	:	two conductor disconnect terminal block, 1-pole
types	:	280-... with suffixes -869, -871, -875, -880, -882, -884
rated voltage	:	250 V
rated impulse withstand voltage	:	4 kV
rated current	:	16 A
description	:	two- and four conductor disconnect terminal block with shield
types	:	280-... with suffixes -622, -685, -676, -695
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	four-conductor disconnect terminal block, 1-pole

Product data of carrier terminal blocks:

types	:	280-... with suffixes -616, -916
description	:	two-conductor carrier terminal block, 1-pole
types	:	280-610
description	:	three-conductor carrier terminal block, 1-pole
types	:	280-... with suffixes -606, -686
description	:	four-conductor carrier terminal block, 1-pole

Remarks

Product data of double potential terminal blocks:

types	:	280-... with suffixes -626, -826, -989, -995
rated voltage	:	800 V
rated impulse withstand voltage	:	8 kV
description	:	four-conductor double potential terminal block, 1-pole

product data of diode, LED and variable resistor terminal blocks::

types	:	280-... with suffixes -613, -915, -673, -623, -655 and additional suffixes /281-410, /281-411
rated voltage	:	250 V
description	:	2 and four conductor diode terminal block
types	:	280-... with suffixes -615/281-412, -645/281-412 -615/281-428
rated voltage	:	250 V
description	:	variable resistor terminal block
types	:	280-... with suffixes -940/281-410, -940/281-411, -941/281-492 -941/281-941, -942/281-487, -942/281-488, -942/281-489, -942/281-490
rated voltage	:	250 V
description	:	double deck diode terminal block
types	:	280-... with suffixes -624/281-434, -624/281-413, -624/281-413
rated voltage	:	24 V
description	:	four-conductor LED terminal block
types	:	280-... with suffixes -943/281-434, -943/281-413
rated voltage	:	24 V
description	:	double deck LED terminal block

Product data of rail mounted through terminal blocks:

rated voltage	:	1000 V
rated impulse withstand voltage	:	8 kV
types	:	780-... with suffixes -601, -602, -604, -992
description	:	two-conductor through terminalblock, 1-pole
types	:	780-... with suffixes -631, -651, -654, -993
description	:	three-conductor through terminal block, 1-pole

Product data of a rail mounted earth terminal block:

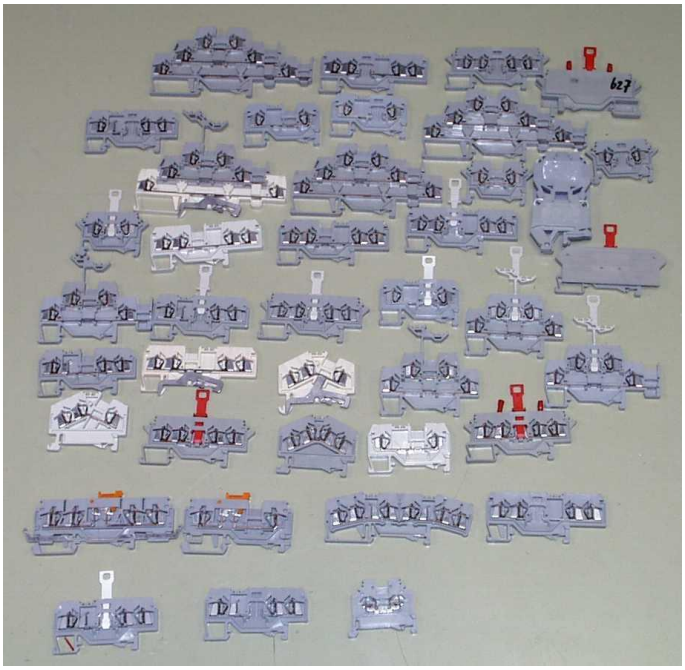
types	:	780-... with suffixes -607, -607/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	780-... with suffixes -637, -640, -677, -637/999-950
description	:	three-conductor earth terminal block, 1-pole

Remarks

Product data of a rail mounted neutral terminal block:

rated voltage	:	400 V
rated impulse withstand voltage	:	6kV
type	:	780-613
description	:	two conductor through terminal block with neutral busbar connection of a busbar 3 x 10 mm, 1-pole
rated voltage	:	max. 800 V
connection	:	2,5 mm²

Remarks





Test Report issued under the responsibility of:

DEKRA

TEST REPORT
EN 60947-7-2
Low-voltage switchgear and controlgear
Part 7: Ancillary equipment

Section Two: Protective terminal terminal blocks for copper conductors

Report Reference No.....:	***2157201.51***
Date of issue.....:	***17 October, 2012***
Total number of pages .....:	***28 pages***
CCA Testing Laboratory .....:	***DEKRA Certification B.V.***
Address .....:	***Utrechtseweg 310, 6812 AR Arnhem, The Netherlands***
Applicant's name.....:	***WAGO Kontakttechnik GmbH & Co. KG***
Address .....:	***Hansastrasse 27, Minden, Germany***
Test specification:	
Standard.....:	EN 60947-7-2:2009
Test procedure .....:	CCA scheme
Non-standard test method……..:	N/A
Test Report Form No.....:	EN 60947_7-2 B
Test Report Form(s) Originator .....:	DEKRA Certification B.V.
Master TRF.....:	Dated 2009-06

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

Test item description .....:	**ground (earth) conductor terminal blocks**
Trade Mark .....:	**WAGO**
Manufacturer .....:	**WAGO Kontakttechnik GmbH & Co.KG**
	Hansastrasse 27; 32425 Minden ,Germany
Model/Type reference.....:	**WAGO 280 / 780**
Ratings .....:	**2,5 mm²**
Factory location .....:	**WAGO Kontakttechnik GmbH & Co.KG** **Hansastrasse 27; 32425 Minden ,Germany**
	See complete view of factory locations: General product information on page 5

Testing procedure and testing location:	
☒ **CCA Testing Laboratory**:	**DEKRA Certification B.V.**
Testing location/ address.....:	**Utrechtseweg 310, 6812 AR Arnhem, The Netherlands**
☐ **Associated CCA Laboratory:**	
Testing location/ address.....:	
Tested by (name + signature).....:	***W.C. 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): **Complete investigation**	**Testing location:** ***DEKRA Certification B.V.*** ***Utrechtseweg 310, 6812 AR Arnhem,*** ***The Netherlands***
Summary of compliance with National Differences:	
Copy of marking plate **WAGO 280** **WAGO 780**	

Test item particulars ..... :	
Classification of installation and use ..... :	
Supply Connection..... :	
..... :	
..... :	
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 ..... :	**06-2005**
Date (s) of performance of tests ..... :	**06-2005**

General remarks:

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.

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"(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.

The tests are carried out on 780-607

Additional tests are carried out on 280-597, 280-607 and 280-510

This TRF replaces TRF 2082859.64

General product information:

see page 23 and 28 for description

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, Nodia 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

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 or 6***
- PE or PEN functions	:	**PE function**
- rated cross-section (mm²)	:	**2,5 mm²**
- rated connecting capacity (mm²)	:	***0,08 – 2,5 mm² (rigid or flexible)***

EN 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	**280 and 780**	**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 EN 60 947-7-2	**IEC 947-7-2**	**P**
	- rated cross-section	**2,5 mm²**	**P**
	- rated connecting capacity	**in catalogue** **0,08 mm² - 2,5 mm²**	**P**
	- service conditions if different from those of Cl. 6.		**N**
	- PE function only if supplied with or intended for use only with steel in the current-carrying path		**N**
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**

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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**

EN 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	**0,08 mm² - 2,5 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 (35mm)**	—
	torque (Nm) clamping to support .....:	**-**	—
	steel pin diameter (mm) .....:	**1 mm**	—
	tightening torque clamping units (Nm) ..... :	**-**	—
	force (N) .....:	**1 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 strenght of clamping units		
8.2.4.2	Mechanical strength of terminals (EN 60947-1) **(type 280-510)**		
	rated cross-section of a rigid conductor (mm²) ....:	**2,5 mm²**	—

EN 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	diameter of thread (mm) ..... :	**-**	—
	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) .... :	**2,5 mm²**	—
	test current (A) d.c. ..... :	**2,4 A**	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV ..... :	**1,35 mV – 1,76 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**
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test ..... :	**1,42 mV – 0,89 mV**	**P**
	minimum cross-section of a flexible conductor (mm²) ..... :	**0,08 mm²**	—
	test current (A) d.c. ..... :	**0,1 A**	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV ..... :	**0,42 mV – 0,58 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**
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test ..... :	**0,47 mV – 0,49 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		**P**
	rated cross-section of a rigid conductor (mm²) .... :	**2,5 mm²**	—
	test current (A) d.c. ..... :	**2,4 A**	—

EN 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	voltage drop (mV) before mechanical strength test not exceeding 6,4 mV .....:	**1,18 mV – 1,01 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
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test .....:	**1,25 mV – 0,97 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) ....:	**0,08 mm² rigid and flexible**	—
	number of conductor of the smallest cross-section .....:	**1**	—
	diameter of bushing hole (mm) .....:	**6,4 mm**	—
	height between the equipment and the platen (mm) .....:	**260 mm**	—
	mass at the conductor(s) (kg) .....:	**0,1 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) .....:	**4 N**	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		**P**
	conductor of the rated rated cross-section (mm²) :	**2,5 mm² rigid and flexible**	—
	number of conductor of the rated cross-section ..:	**1**	—
	diameter of bushing hole (mm) .....:	**9,5 mm**	—
	height between the equipment and the platen (mm) .....:	**280 mm**	—
	mass at the conductor(s) (kg) .....:	**0,7 kg**	—
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		**P**

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Clause	Requirement – Test	Result - Remark	Verdict
	Pull-out test		
	force (N) ..... :	**50 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) ..... :	**2,5 mm² rigid and flexible**	—
	number of conductor of the largest cross-section :	**1**	—
	diameter of bushing hole (mm) ..... :	**9,5 mm**	—
	height between the equipment and the platen (mm) ..... :	**279 mm**	—
	mass at the conductor(s) (kg) ..... :	**0,7 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) ..... :	**50 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**
	Pull-out test		
	force (N) ..... :		—

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Clause	Requirement – Test	Result - Remark	Verdict
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		**N**
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)	**1,0 mm²**	**P**
8.4.3	Dielectric tests **(280-510)**		
	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) .....:	**2,5 mm² / rigid / 8 - 9 mm**	—
	- rated impulse withstand voltage (kV) .....:	**6 kV**	—
	- test Uimp main circuits (kV) .....:	**7,3 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) :	**2,5 mm² / rigid / 8 - 9 mm**	—
	- rated insulation voltage (V) .....:	**400 V**	—
	- test voltage for 5 sec (V) .....:	**1890 V**	**P**
8.4.5	Temperature-rise test		
	Temperature rise conditions:		
	- test current (A) .....:		—
	- cross-section of the conductor (mm²) .....:		—
	- torque (Nm) clamping unit .....:		—
	- torque (Nm) clamping to support .....:		—
	Temperature-ise without support		**N**
	- temperature-rise does not exceed 45 K		**N**

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Clause	Requirement – Test	Result - Remark	Verdict
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:		—
	- voltage drop (mV) before temperature-rise test not exceeding 3,2 mV .....:	1 - 2 - 3 - 4 - 5 -	**N**
	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**
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature rise test .....:	1 - 2 - 3 - 4 - 5 -	**N**
	Temperature-rise with support		
	- rail profile and material .....:		—
	- temperature-rise does not exceed 45 K .....:	1 - 2 -	—
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. .....:		—
	- voltage drop (mV) before temperature-rise test not exceeding 6,4 mV .....:	1 - 2 -	**N**
	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**
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test .....:	1 - 2 -	**N**
8.4.6	Short-time withstand current test		
	- cross-section of the conductor (mm²) .....:	**2,5 mm²**	—
	- torque (Nm) clamping unit .....:	**-**	—

EN 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	- rail profile and material .....:	**EN 50022 (35 mm)**	—
	- torque (Nm) clamping to support .....:	**-**	—
	Test current from clamping unit to clamping unit (1-1)		
	- test current (A) .....:	**1 - 300 A** **2 - 300 A** **3 - 300 A**	—
	- duration of the test current (s) .....:	**1 -1 s** **2 -1 s** **3 -1 s**	—
	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) .....:	**2,5 mm²**	—
	- test current (A) d.c. .....:	**2,4 A**	—
	- voltage drop (mV) after short-time withstand current test not exceeding 3,2 mV .....:	**1,75 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**
	Test current from clamping unit to support (2-2)		
	- test current (A) .....:	**1 - 300 A** **2 - 300 A** **3 - 300 A**	—
	- duration of the test current (s) .....:	**1 -1 s** **2 -1 s** **3 -1 s**	—
	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**

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Clause	Requirement – Test	Result - Remark	Verdict
	Voltage drop after short-time withstand current test		
	- cross-section of the conductor (mm²) .....:	**2,5 mm²**	—
	- test current (A) d.c. .....:	**2,4 A**	—
	- voltage drop (mV) after short-time withstand current test not exceeding 6,4 mV .....:	**1,90 mV – 2,20 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**
8.4.6	Short-time withstand current test **(type 280-510)**		
	- cross-section of the conductor (mm²) .....:	**2,5 mm²**	—
	- torque (Nm) clamping unit .....:	**-**	—
	- rail profile and material .....:	**EN 50022 (35 mm)**	—
	- torque (Nm) clamping to support .....:	**-**	—
	Test current from clamping unit to clamping unit (1-1)		
	- test current (A) .....:	**1 - 300 A** **2 - 300 A** **3 - 300 A**	—
	- duration of the test current (s) .....:	**1 -1 s** **2 -1 s** **3 -1 s**	—
	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) .....:	**2,5 mm²**	—
	- test current (A) d.c. .....:	**2,4 A**	—
	- voltage drop (mV) after short-time withstand current test not exceeding 3,2 mV .....:	**2,08 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**

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Clause	Requirement – Test	Result - Remark	Verdict
	Test current from clamping unit to support (2-2)		
	- test current (A) .....:	**1 - 300 A** **2 - 300 A** **3 - 300 A**	—
	- duration of the test current (s) .....:	**1 -1 s** **2 -1 s** **3 -1 s**	—
	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) .....:	**2,5 mm²**	—
	- test current (A) d.c. .....:	**2,4 A**	—
	- voltage drop (mV) after short-time withstand current test not exceeding 6,4 mV .....:	**1,79 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**
8.4.7	Ageing test (for screwless-type terminal blocks only)		
	Maximum abient temperature (°C) .....:	**40° C**	—
	Rated cross-section solid or stranded (mm²) .....:	**2,5 mm² on request of 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 .....:	**2,4 A**	—
	Rail profile and material .....:	**EN 50022 (35 mm)**	—
	Torque (Nm) clamping to support .....:		—
	Voltage drop after 0 cycles:		

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Clause	Requirement – Test	Result - Remark	Verdict
	- requirement for clamping unit to clamping unit: ≤ 3,2 mV (mV) ..... :	**1,24 mV – 2,51mV**	**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**
	- requirement for clamping unit to support: ≤ 6,4 mV (mV) ..... :	**1,69 mV - 1,71 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**
	Voltage drop after the 24th cycle:		
	- requirement for clamping unit to clamping unit: 4,8 mV (mV) ..... :	**1,20 mV – 2,94 mV**	**P**
	- requirement for clamping unit to support: 9,6 mV (mV) ..... :	**1,65 mV – 1,70 mV**	**P**
	Voltage drop after the 48th cycle		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,22 mV – 2,99 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,63 mV – 174 mV**	**P**
	Voltage drop after the 72th cycle:		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,19 mV – 2,89 mV**	**P**

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Clause	Requirement – Test	Result - Remark	Verdict
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,62 mV – 1,75 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) .....:	**1,18 mV – 2,92 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,60 mV – 1,73 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) .....:	**1,17 mV – 2,92 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,58 mV – 1,76 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) .....:	**1,18 mV – 2,91 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,56 mV – 1,78 mV**	**P**
	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) .....:	**1,20 mV – 2,84 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,54 mV – 1,80 mV**	**P**
	Voltage drop after the 192th 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) .....:	**1,15 mV – 2,76 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,55 mV – 1,79 mV**	**P**
	Pull-out test		
	force (N) .....:	**50 N**	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		**P**
8.4.7	Ageing test (for screwless-type terminal blocks only) **(type 280-510)**		
	Maximum abient temperature (°C) .....:	**40° C**	—
	Rated cross-section solid or stranded (mm²) .....:	**2,5 mm² on request of 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 .....:	**2,4 A**	—
	Rail profile and material .....:	**EN 50022 (35 mm)**	—
	Torque (Nm) clamping to support .....:		—
	Voltage drop after 0 cycles:		
	- requirement for clamping unit to clamping unit: ≤ 3,2 mV (mV) .....:	**1,84 mV – 2,50 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**

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Clause	Requirement – Test	Result - Remark	Verdict
	- requirement for clamping unit to support: ≤ 6,4 mV (mV) ..... :	**1,80 mV - 3,56 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**
	Voltage drop after the 24th cycle:		
	- requirement for clamping unit to clamping unit: 4,8 mV (mV) ..... :	**1,85 mV – 2,56 mV**	**P**
	- requirement for clamping unit to support: 9,6 mV (mV) ..... :	**1,92 mV – 3,39 mV**	**P**
	Voltage drop after the 48th cycle		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,83 mV – 2,56 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,94 mV – 3,76 mV**	**P**
	Voltage drop after the 72th cycle:		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,79 mV – 2,64 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,98 mV – 3,58 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) ..... :	**1,78 mV – 2,65 mV**	**P**

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Clause	Requirement – Test	Result - Remark	Verdict
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,92 mV – 3,62 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) .....:	**1,76 mV – 2,65 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,95 mV – 3,56 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) .....:	**1,72 mV – 2,66 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,97 mV – 3,54 mV**	**P**
	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) .....:	**1,70 mV – 2,68 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 – 3,45 mV**	**P**
	Voltage drop after the 192th cycle:		
	- requirement for clamping unit to clamping unit: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,69 mV – 2,69 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) .....:	**1,87 mV – 3,64 mV**	**P**
	Pull-out test		
	force (N) .....:	**50 N**	—

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Clause	Requirement – Test	Result - Remark	Verdict
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		**P**
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.	5s	**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 EN 60947-1 applies with the following addition		**N**
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**
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**

Remarks

Description of types:

Product data of rail mounted through terminal blocks:

rated voltage	:	800 V
rated impulse withstand voltage	:	8 kV
types	:	280-... with suffixes -101, -102, -103, -104, -105, -601, -602, -691, -901, -902, -903, -904, -905, -906, -991, -992
description	:	two-conductor through terminal block, 1-pole
types	:	280-... with suffixes -641, -650, -651, -653, -654, -671, -672, -681, -684, -898, -993, -998
description	:	three-conductor through terminal block, 1-pole
types	:	280-... with suffixes -603, -604, -621, -633, -634, -646, -656, -699, -830, -831, -832, -833, -834, -835, -946, -990, -994, -996, -999
description	:	four-conductor through terminal block, 1-pole

Product data of a rail mounted earth terminal block::

types	:	280-... with suffixes -107, -108, -607, -907, -107/999-950, 607/999-950, -907/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	280-... with suffixes -637, -687, -637/999-950, -687/999-950
description	:	three-conductor earth terminal block, 1-pole
types	:	280-... with suffixes -677, -837, -677/999-950
description	:	four-conductor earth terminal block, 1-pole

product data of shield conductor terminal blocks:

type	:	280-640
description	:	three-conductor shield terminal block, 1-pole
types	:	280-... with suffixes -678, -838
description	:	four-conductor shield terminal block, 1-pole

Remarks

Product data of double deck terminal blocks:

types	:	280-... with suffixes -513, -519, -520, -523, -524, -529, -530, -533, -534, -539, -540, -541, -542, -543
rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	20 A
description	:	two-conductor through/through terminal block, 2-poles
types	:	280-... with suffixes -517, -527, -537
rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	20 A
description	:	two-conductor earth/through terminal block, 2-poles
types	:	280-... with suffixes -521, -522, -525, -526
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	two-conductor through/ disconnect terminal block, 2-poles
types	:	280-... with suffixes -531, -532
rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	6,3 A / 20 A
description	:	two-conductor through/carrier terminal block, 2-poles

Product data of triple deck terminal blocks:

rated voltage	:	500 V
rated impulse withstand voltage	:	6 kV
rated current	:	20 A
types	:	280-... with suffixes -510, -547, -557, -597
description	:	two-conductor earth/through/ through terminal block, 3-poles
types	:	280-... with suffixes -548, -558
description	:	two-conductor shield/through/ through terminal block, 3-poles
types	:	280-... with suffixes -549, -550, -551, -552
description	:	two-conductor through/through/ through terminal block, 3-poles

Remarks

Product data of discon nect terminal block:

types	:	280-... with suffixes -612, -627, -649, -912
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	two-conductor disconnect terminal block, 1-pole
types	:	280-683
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	three-conductor disconnect terminal block, 1-pole
types	:	280-... with suffixes -874, -881, -883, -885
rated voltage	:	250 V
rated impulse withstand voltage	:	4 kV
rated current	:	16 A
description	:	two-conductor disconnect terminal block, 1-pole
types	:	280-... with suffixes -870, -868, -876, -879
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	16 A
description	:	two conductor disconnect terminal block, 1-pole
types	:	280-... with suffixes -869, -871, -875, -880, -882, -884
rated voltage	:	250 V
rated impulse withstand voltage	:	4 kV
rated current	:	16 A
description	:	two- and four conductor disconnect terminal block with shield
types	:	280-... with suffixes -622, -685, -676, -695
rated voltage	:	400 V
rated impulse withstand voltage	:	6 kV
rated current	:	10 A
description	:	four-conductor disconnect terminal block, 1-pole

Product data of carrier terminal blocks:

types	:	280-... with suffixes -616, -916
description	:	two-conductor carrier terminal block, 1-pole
types	:	280-610
description	:	three-conductor carrier terminal block, 1-pole
types	:	280-... with suffixes -606, -686
description	:	four-conductor carrier terminal block, 1-pole

Remarks

Product data of double potential terminal blocks:

types	:	280-... with suffixes -626, -826, -989, -995
rated voltage	:	800 V
rated impulse withstand voltage	:	8 kV
description	:	four-conductor double potential terminal block, 1-pole

product data of diode, LED and variable resistor terminal blocks::

types	:	280-... with suffixes -613, -915, -673, -623, -655 and additional suffixes /281-410, /281-411
rated voltage	:	250 V
description	:	2 and four conductor diode terminal block
types	:	280-... with suffixes -615/281-412, -645/281-412 -615/281-428
rated voltage	:	250 V
description	:	variable resistor terminal block
types	:	280-... with suffixes -940/281-410, -940/281-411, -941/281-492 -941/281-941, -942/281-487, -942/281-488, -942/281-489, -942/281-490
rated voltage	:	250 V
description	:	double deck diode terminal block
types	:	280-... with suffixes -624/281-434, -624/281-413, -624/281-413
rated voltage	:	24 V
description	:	four-conductor LED terminal block
types	:	280-... with suffixes -943/281-434, -943/281-413
rated voltage	:	24 V
description	:	double deck LED terminal block

Product data of rail mounted through terminal blocks:

rated voltage	:	1000 V
rated impulse withstand voltage	:	8 kV
types	:	780-... with suffixes -601, -602, -604, -992
description	:	two-conductor through terminalblock, 1-pole
types	:	780-... with suffixes -631, -651, -654, -993
description	:	three-conductor through terminal block, 1-pole

Product data of a rail mounted earth terminal block:

types	:	780-... with suffixes -607, -607/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	780-... with suffixes -637, -640, -677, -637/999-950
description	:	three-conductor earth terminal block, 1-pole

Remarks

Product data of a rail mounted neutral terminal block:

rated voltage	:	400 V
rated impulse withstand voltage	:	6kV
type	:	780-613
description	:	two conductor through terminal block with neutral busbar connection of a busbar 3 x 10 mm, 1-pole
rated voltage	:	max. 800 V
connection	:	2,5 mm²

Remarks

