CERTIFICATE

Issued to:
Applicant:
WAGO Kontakttechnik GmbH & Co. KG
Hansastraße 27
32423 Minden/westfalen, Germany

Licensee:
WAGO Kontakttechnik GmbH & Co. KG
Hansastraße 27
32423 Minden/westfalen, Germany

Product	:	Terminal blocks for copper conductors
Trade name(s)	:	WAGO
Type(s)/model(s)	:	281 and 781

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 and 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 25 March 2019 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 71-107288

DEKRA Certification B.V.

B.T.M. Holtus
Managing Director

H.R.M. Barends
Certification Manager

© Integral publication of this certificate is allowed

ACCREDITED BY THE
DUTCH ACCREDITATION
COUNCIL

PRODUCTS
RvA C 001

KEMA KEUR

SPECIFICATION OF THE CERTIFIED PRODUCT

Product data

Product	:	Terminal blocks for copper conductors
Trade name(s)	:	WAGO
Type(s)/model(s)	:	281 and 781
Connection	:	screwless terminals for conductor cross sectional area of 0,08 mm² - 4 mm² flexible or rigid
Material	:	thermoplastic material grey, light grey, dark grey, blue white, orange, red black, yellow and green/yellow
Method of mounting	:	types 281-102, -103 and 105; for mounting on G-profile 32 mm other types; for mounting on top hat rail 35 mm

Product data – type 281

Rated insulation voltage (Ui)	:	max. 800 V
Rated impulse withstand voltage	:	max. 8 kV
Conventional free air thermal current (Ith)	:	max. 32 A

Product data – type 781

Rated insulation voltage (Ui)	:	max. 1000 V
Rated impulse withstand voltage	:	max. 8 kV
Conventional free air thermal current (Ith)	:	max. 32 A

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 223399700.

Additional information

- Through, double terminal blocks are tested according to EN 60947-7-1.

- Earth terminal blocks are tested according to EN 60947-7-2.

- This certificate replaces certificate 2187239.01 dated 7 December, 2015.

This certificate replaces certificate No. 2160584.05 which we herewith declare invalid.

Conclusion

The examination proved that all requirements were met.

Factory locations

Wago Elwag
Innowacyjna 2
55-330 Wroblowice, Poland

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

Wago Pvt. Ltd.
C-27, Sector-58, Phase III
201301 Noida Uttar Pradesh, India

Wago Electronic (Tianjin) Co. Ltd.
No. 5 Quanhui Road
Wu Qing Development Area
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
CP 168
1564 Domdidier, Switzerland

Description of Types:

Product data of rail mounted through terminal blocks

rated insulation voltage (Ui)	:	800 V
conventional free air thermal current (Ith)	:	32 A
rated impulse withstand voltage	:	8 kV
types	:	281-... with suffixes -101, -102, -103, -104, -105, -191, -604, -601, -691, -901, -902, -903, -904, -905, -906, -991, -992
description	:	two-conductor through terminal block, 1-pole
types	:	281-... with suffixes -631, -651, -678, -679, -681, -684, -685, -686, -693, -695, -993, -998
description	:	three-conductor through terminal block, 1-pole
types	:	281-... with suffixes -652, -653, -654, -655, -663, -664, -668, -994
description	:	four-conductor through terminal block, 1-pole

Product data of rail mounted earth and shield terminal blocks

types	:	281-... with suffixes -107, -607, -637, -907, -108, -107/999-950, -607/999-950, -637/999-950, -907/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	281-... with suffixes -687, -687/999-950
description	:	three-conductor earth terminal block, 1-pole
types	:	281-... with suffixes -657, -657/999-950
description	:	four-conductor earth terminal block, 1-pole
type	:	281-658
description	:	four-conductor shield terminal block, 1-pole

Product data of double deck terminal blocks

types	:	281-... with suffixes -619, -620, -629, -630
rated insulation voltage (Ui)	:	500 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	26 A
description	:	two-conductor through/through terminal block, 2-poles

Product data of rail-mounted terminal blocks for wiring of electric motors

type	:	281-530
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	20 A, 2,5 mm² 25 A, 4,0 mm²
description	:	two-conductor through/through /through terminal block 3-poles one-conductor earth terminal block 1-pole
type	:	281-531
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	20 A, 2,5 mm² 25 A, 4,0 mm²
description	:	two-conductor through/through terminal block, 2-poles

Product data of rail-mounted terminal blocks for wiring of electric motors (continued)

type	:	281-532
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	20 A, 2,5 mm² 25 A, 4,0 mm²
description	:	two conductor through/through/ through terminal block, 3-poles

Product data of disconnect terminal blocks

types	:	281-... with suffixes -666, -912
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	10 A
description	:	two-conductor disconnect terminal block, 1-pole

type	:	281-683
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	10 A
description	:	three-conductor disconnect terminal block, 1-pole

types	:	281-... with suffixes -659, -660
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	10 A
description	:	four-conductor disconnect terminal block, 1-pole

Product data of carrier terminal blocks

rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	10 A
types	:	281-... with suffixes -916, -917
description	:	two-conductor carrier terminal block, 1-pole

type	:	281-610
description	:	three-conductor carrier terminal block, 1-pole

type	:	281-656
description	:	four-conductor carrier terminal block, 1-pole

Product data of carrier terminal block with disconnect plug

type	:	281-624
rated insulation voltage (Ui)	:	800 V
rated impulse withstand voltage	:	8 kV
conventional free air thermal current (Ith)	:	16 A
description	:	two-conductor carrier terminal block, 1-pole with disconnect plug; mechanical endurance: 50 operating cyclus, electrical endurance : 10 operating cyclus 2000 W at 220 Vac and 1000 W at 220 Vdc

Product data of diode and LED terminal blocks

types	:	281-... with suffixes -603, -915, -673, -665 and additional suffixes /281-400, /281-401, /281-410, /281-411
rated insulation voltage (Ui)	:	250 V
description	:	two- and four-conductor diode terminal block
types	:	281-... with suffixes -633/281-410, -633/281-411, -635/281-492, -635/281-491, -636/281-487, 636/281-488, -635/281-489, -635/281-490
rated insulation voltage (Ui)	:	250 V
description	:	double deck diode terminal block
types	:	281-... with suffixes -634/281-434, -634/281-413
rated insulation voltage (Ui)	:	24 V
description	:	double deck LED terminal block

Product data of rail mounted through terminal blocks

rated insulation voltage (Ui)	:	1000 V
conventional free air thermal current (Ith)	:	32 A
rated impulse withstand voltage	:	8 kV
types	:	781-... with suffixes -601, -604, -992
description	:	two-conductor through terminal block, 1-pole
types	:	781-... with suffixes -631, -651, -993
description	:	three-conductor through terminal block, 1-pole

Product data of a rail mounted earth terminal block

types	:	781-... with suffixes -607, -607/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	781-... with suffixes -637, -637/999-950
description	:	three-conductor earth terminal block, 1-pole

Product data of a rail mounted neutral terminal block

rated insulation voltage (Ui)	:	400 V
conventional free air thermal current (Ith)	:	25 A
rated impulse withstand voltage	:	6 kV
types	:	781- … with suffixes -613, -623
description	:	one conductor through terminal block with neutral busbar connection of a busbar 3 x 10 mm, 1 pole
types	:	781-… with suffixes -643, -653
description	:	two conductor through terminal block with neutral busbar connection of a busbar 3 x 10 mm, 1 pole

ECS European Certification System

OD ECS 040-1
ed. May 2013

Responsible CB: DEKRA

TEST REPORT SUMMARY

Report Reference No. ..... :	**2233997.50**
Date of issue ..... :	**2019-03-20**
Tested by (name + signature) ..... :	**W.C. van Ginkel**
Witnessed by (name + signature) .... :	
Approved by (name + signature) ..... :	**C.C. Burger**
Supervised by (name + signature) ... :	

Testing Laboratory ..... :	**DEKRA Certification B.V.**
Address ..... :	Meander 1051, 6825 MJ Arnhem, The Netherlands
Testing procedure ..... :	☒ ENEC/CCA-TL ☐ IECEE-CBTL ☐ TMP ☐ WMT ☐ SMT
Testing location ..... :	**DEKRA Certification B.V.**
Address ..... :	**Meander 1051, 6825 MJ Arnhem, The Netherlands**

Applicant ..... :	**WAGO Kontakttechnik GmbH & Co. KG**
Address ..... :	**Hansastraße 27, 32423 Minden/Westfalen, Germany**
Manufacturer ..... :	**WAGO Kontakttechnik GmbH & Co. KG**
Address ..... :	**Hansastraße 27, 32423 Minden/Westfalen, Germany**

Product ..... :	**Terminal blocks for copper conductors**
Model/Type reference ..... :	**281 and 781**
Trademark ..... :	WAGO
Ratings ..... :	**4 mm², 24 V – 1000 V**

Certification Scheme ..... : ☐ ENEC ☒ CCA ☐ Other: _____

Standard(s) ..... : **EN 60947-7-1:2009 used in conjunction with EN 60947-1:2007**

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

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

This EN test report consists of the following parts:

☒ **IEC TRF No.:** IEC60947_7_1B Report Reference No ..... : **2233997.50**

☐ **CENELEC-Addendum Form No.** _____ ..... **:** Report Reference No. or Annex No.. :

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Test Report issued under the responsibility of:

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

Report Number. ..... :	**2233997.50**
Date of issue..... :	**2019-03-20**
Total number of pages..... :	**46**
Name of Testing Laboratory preparing the Report..... :	DEKRA Certification B.V. Meander 1051, 6825 MJ, Arnhem, The Netherlands
Applicant's name..... :	**WAGO Kontakttechnik GmbH & Co. KG**
Address..... :	**Hansastraße 27, 32423 Minden/Westfalen, Germany**
Test specification:	
Standard ..... :	IEC 60947-7-1:2009 (Third Edition) in conjunction with IEC 60947-1 (Fifth Edition) + A1:2012 + A2:2014
Test procedure ..... :	CB Scheme
Non-standard test method..... :	N/A
Test Report Form No..... :	IEC60947_7_1B
Test Report Form(s) Originator... :	DEKRA Certification B.V.
Master TRF ..... :	Dated 2015-10

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

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description ..... :	**Terminal blocks for copper conductors**
Trade Mark..... :	
Manufacturer ..... :	**WAGO Kontakttechnik GmbH & Co. KG**
Model/Type reference..... :	**281 and 781**
Ratings..... :	**type 281: 4 mm², 24 V – 800 V** **type 781: 4 mm², 400 V – 1000 V**

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒	**CB Testing Laboratory:**	
Testing location/ address .....:	**DEKRA Certification B.V.** **Meander 1051, 6825 MJ, Arnhem, The Netherlands**	
☐	**Associated CB Testing Laboratory:**	
Testing location/ address .....:		
Tested by (name, function, signature) .....:	**W.C. van Ginkel**	
Approved by (name, function, signature) ..:	**C.C. Burger**	
☐	**Testing procedure: CTF Stage 1:**	
Testing location/ address .....:		
Tested by (name, function, signature) .....:		
Approved by (name, function, signature) ..:		
☐	**Testing procedure: CTF Stage 2:**	
Testing location/ address .....:		
Tested by (name + signature) .....:		
Witnessed by (name, function, signature) .:		
Approved by (name, function, signature) ..:		
☐	**Testing procedure: CTF Stage 3:**	
☐	**Testing procedure: CTF Stage 4:**	
Testing location/ address .....:		
Tested by (name, function, signature) .....:		
Witnessed by (name, function, signature) .:		
Approved by (name, function, signature) ..:		
Supervised by (name, function, signature) .....:		

List of Attachments (including a total number of pages in each attachment): N	
Summary of testing:	
Tests performed (name of test and test clause): **Complete investigation** **<u>2160584.56 dated 5 March 2013</u>** **All tests are carried out on 781-601, 781-613, 281-101 and 281-601.** **<u>2187239.50 dated 15 October 2015</u>** **Additional tests are carried out on 281-530, 281-611, 281-619, 281-624, 281-631, 281-652, 281-659 and 281-912.** **<u>2233997.50 latest</u>** **Addition of type 281-917. No test necessary.**	**Testing location:** **DEKRA Certification B.V.** **Meander 1051, 6825 MJ, Arnhem,** **The Netherlands**
Summary of compliance with National Differences (List of countries addressed): N ☒ **The product fulfils the requirements of EN 60947-7-1: 2009.**	

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Test item particulars ..... :	**Terminal blocks for copper conductors**
Classification of installation and use..... :	
Supply Connection ..... :	
Particulars: test item vs. test requirements	
- method of fixing ..... :	**top hat rail 35 mm**
- number of poles ..... :	**1-4 poles**
- type of clamping units ..... :	**screwless-type terminal**
- ability to receive conductors ..... :	**unprepared conductors, (flexible or rigid)**
- number of terminals on terminal assembly ..... :	**1-4**
- rated cross-section (mm²)..... :	**4 mm²**
- rated connecting capacity (mm²) ..... :	**0,08 mm² - 4 mm² rigid and flexible**
- rated insulation voltage (U_i)..... :	**Type 281: 24 V – 800 V**
	Type 781: 400 V – 1000 V
- rated impulse withstand voltage (U_{imp})..... :	**6 kV or 8 kV**
- Conventional free air thermal current (I_{th}) ..... :	**32 A, 26 A, 25 A, 20 A, 16 A, 10 A**
Possible test case verdicts:	
- test case does not apply to the test object..... :	**N**
- test object does meet the requirement ..... :	**P (Pass)**
- test object does not meet the requirement..... :	**F (Fail)**
Testing ..... :	
Date of receipt of test item..... :	**02-2013 / 10-2015**
Date (s) of performance of tests ..... :	**02-2013 / 10-2015**
General remarks:	
"(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.**	

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	☒ **Yes** ☐ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :

Wago Elwag
Innowacyjna 2
55-330 Wroblowice, Poland

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

Wago Pvt. Ltd.
C-27, Sector-58, Phase III
201301 Noida Uttar Pradesh, India

Wago Electronic (Tianjin) Co. Ltd.
No. 5 Quanhui Road
Wu Qing Development Area
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
CP 168
1564 Domdidier, Switzerland

General product information:

See page 39 to 45.

Item numbers may be denoted with or without leading zeroes e.g. 281-401 or 281-0401.

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
5.1	**MARKING**		
	Terminal block shall be marked with:		
	- manufacturer's name or trademark		***P***
	- type designation	***281 or 781***	***P***
5.2	The following information shall be stated by the manufacturer if applicable, e.g. in the manufacturer's data sheet, or his catalogue or on the packing unit:		
	- manufacturer's claim for compliance with IEC 60 947-7-1	***IEC 60947-7-1***	***P***
	- rated cross-section	***4 mm²***	***P***
	- rated connecting capacity	***0,08 mm² - 4 mm² rigid and flexible***	***P***
	- rated insulation voltage (U_i)	***24 V - 1000 V***	***P***
	- rated impulse withstand voltage (U_{imp})	***6 kV or 8 kV***	***P***
	- conventional free air thermal current (I_{th})		***N***
	- service conditions if different from those of Cl. 6.		***N***

7.	**CONSTRUCTION**		
7.1	Constructional requirements		***P***
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***

IEC 60947-7-1			
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	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		***N***
	- 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***

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
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 - 4 mm² rigid and flexible***	***P***

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

8	**TESTS**		
8.3	Verification of mechanical characteristics		
8.3.2	Attachment of the terminal block on its support		
	mounting rail ..... :	***Rail 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 strength of clamping units		
8.2.4.1	Mechanical strength of clamping units (IEC60947-1)		
	rated cross-section of a rigid conductor (mm²) ... :	***4 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) ... :	***4 mm²***	—
	test current (A) d.c. ..... :	***3,2 A***	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV ..... :	***1,22 mV – 2,80 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***
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test :	***1,25 mV – 2,58 mV***	***P***
	minimum cross-section of a flexible conductor (mm²) ..... :	***0,08 mm²***	—
	test current (A) d.c. ..... :	***0,1 A***	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV ..... :	***0,35 mV - 0,65 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 ..... :	***0,35 mV - 0,80 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 flexible and rigid***	—
	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***	***P***
	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) ..... :	***4 mm² flexible and rigid***	—
	number of conductors of the rated cross-section :	***1***	—
	torque (Nm) ..... :	***-***	—
	diameter of bushing hole (mm) ..... :	***9,5 mm***	—
	height between the equipment and the platen (mm) ..... :	***279 mm***	—
	mass at the conductor(s) (kg) ..... :	***0,9 kg***	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		***P***
	Pull-out test		
	force (N) ..... :	***60 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) ..... :	***4 mm² flexible and rigid***	—
	number of conductors of the largest cross-section:	***1***	—
	torque (Nm) ..... :	***-***	—
	diameter of bushing hole (mm) ..... :	***9,5 mm***	—
	height between the equipment and the platen (mm) ..... :	***279 mm***	—
	mass at the conductor(s) (kg) ..... :	***0,9 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) ..... :	***60 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) ..... :		—

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Clause	Requirement – Test	Result - Remark	Verdict
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		***N***
	Pull-out test		
	force (N) ..... :		—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		***N***
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)	***1,5 mm²***	***P***
8.4.2	Verification of clearances and creepage distances		
	Conductor type and conductor cross-section	***4,0 mm²***	—
	Conductor end length (mm)	***8-9 mm***	—
	Type of support	***Rail***	—
8.4.2.2	Clearances		
	Case A (mm) ..... : Case B (mm) ..... : Measured (mm) ..... :	***5,5 mm*** ***2,0 mm*** ***> 5,5 mm***	***P***
	Rated impulse withstand voltage U_{imp} (kV)	***6 kV***	***P***
8.4.2.3	Creepage distances:		
	- pollution degree ..... :	***3***	—
	- comparative tracking index (V) ..... :	***600 V***	—
	- material group ..... :	***I***	—
	- rated insulation voltage U_i (V) ..... :	***250 V, 400 V, 500 V, 800 V or 1000 V***	—

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Clause	Requirement – Test	Result - Remark	Verdict
	- 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: 13,8 mm*** ***500 V: 8,5 mm*** ***800 V: 10,3 mm*** ***1000 V: 12,5 mm***	—
8.4.2.3	Creepage distances:		
	- pollution degree ..... :	***3***	—
	- comparative tracking index (V) ..... :	***600 V***	—
	- material group ..... :	***I***	—
	- rated insulation voltage U_i (V) ..... :	***800 V***	—
	- minimum creepage distances (mm) ..... :	***10 mm***	—
	- measured creepage distances (mm) ..... :	***> 12 mm***	—
8.4.2.3	Creepage distances:		
	- pollution degree ..... :	***3***	—
	- comparative tracking index (V) ..... :	***600 V***	—
	- material group ..... :	***I***	—
	- rated insulation voltage U_i (V) ..... :	***63 V***	—
	- minimum creepage distances (mm) ..... :	***1,6 mm***	—
	- measured creepage distances (mm) ..... :	***1,7 mm***	—
8.4.2	Verification of clearances and creepage distances on **type 281-624**		
	Conductor type and conductor cross-section	***4,0 mm²***	—
	Conductor end length (mm)	***8 – 9 mm***	—
	Type of support	***Rail (35 mm)***	—
8.4.2.2	Clearances		
	Case A (mm) ..... : Case B (mm) ..... : Measured (mm) ..... :	***8 mm*** ***3 mm*** ***> 10 mm***	***P***

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Clause	Requirement – Test	Result - Remark	Verdict
	Rated impulse withstand voltage Uimp (kV)	***8 kV***	***P***
8.4.2.3	Creepage distances:		
	- pollution degree ..... :	***3***	—
	- comparative tracking index (V) ..... :	***600 V***	—
	- material group ..... :	***I***	—
	- rated insulation voltage Ui (V) ..... :	***800 V***	—
	- minimum creepage distances (mm) ..... :	***10 mm***	—
	- measured creepage distances (mm) ..... :	***> 12 mm***	—
8.4.2	Verification of clearances and creepage distances **Type 281-659**		
	Conductor type and conductor cross-section	***4,0 mm²***	—
	Conductor end length (mm)	***8 – 9 mm***	—
	Type of support	***Rail (35 mm)***	—
8.4.2.2	Clearances		
	Case A (mm) ..... : Case B (mm) ..... : Measured (mm) ..... :	***5,5 mm*** ***2 mm*** ***9,91 mm***	***P***
	Rated impulse withstand voltage Uimp (kV)	***6 kV***	***P***
8.4.2.3	Creepage distances:		
	- pollution degree ..... :	***3***	—
	- comparative tracking index (V) ..... :	***600 V***	—
	- material group ..... :	***I***	—
	- rated insulation voltage Ui (V) ..... :	***400 V***	—
	- minimum creepage distances (mm) ..... :	***5 mm***	—
	- measured creepage distances (mm) ..... :	***9,91 mm***	—
8.4.2	Verification of clearances and creepage distances on **type 781-613**		
	Conductor type and conductor cross-section	***4,0 mm²***	—
	Conductor end length (mm)	***8 – 9 mm***	—
	Type of support	***Rail (35 mm)***	—
8.4.2.2	Clearances		

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Clause	Requirement – Test	Result - Remark	Verdict
	Case A (mm) ..... : Case B (mm) ..... : Measured (mm) ..... :	***5,5 mm*** ***2 mm*** ***> 7 mm***	***P***
	Rated impulse withstand voltage Uimp (kV)	***6 kV***	***P***
8.4.2.3	Creepage distances:		
	- pollution degree ..... :	***3***	—
	- comparative tracking index (V) ..... :	***600 V***	—
	- material group ..... :	***I***	—
	- rated insulation voltage Ui (V) ..... :	***400 V***	—
	- minimum creepage distances (mm) ..... :	***5,0 mm***	—
	- measured creepage distances (mm) ..... :	***> 7 mm***	—
8.4	Verification of electrical characteristics		
8.4.3	Dielectric tests		
	Dielectric test, Impulse withstand voltage U_{imp} indicated by the manufacture:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm) ..... :	***4,0 mm² rigid / 8 – 9 mm***	—
	- rated impulse withstand voltage (kV) ..... :	***6 kV or 8 kV***	—
	- test Uimp main circuits (kV) ..... :	***7,4 kV or 9,8 kV***	***P***
	Dielectric test, power-frequency withstand:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm) :	***4,0 mm² / rigid / 8 – 9 mm***	—
	- rated insulation voltage (V) ..... :	***250 V, 400 V, 500 V, 800 V or 1000 V***	—
	- test voltage for 60 sec (V) ..... :	***2000 V, 2500 V, 2500 V, 3000 V or 3500 V for 5 s According to IEC 60947-1 A2:2014; re-testing according to 60 s is not necessary***	***P***
	Dielectric test, Uimp indicated: **on type 281-659 and 781-613**		

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Clause	Requirement – Test	Result - Remark	Verdict
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm) ..... :	***4,0 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:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm) :	***4,0 mm² / rigid / 8 – 9 mm***	**—**
	- rated insulation voltage (V) ..... :	***400 V***	**—**
	- test voltage for 60 sec (V) ..... :	***1890 V for 5 s According to IEC 60947-1 A2:2014; re-testing according to 60 s is not necessary***	***P***
	Dielectric test, Uimp indicated: **on type 281-624**		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm) ..... :	***4,0 mm² rigid / 8 – 9 mm***	**—**
	- rated impulse withstand voltage (kV) ..... :	***8 kV***	**—**
	- test Uimp main circuits (kV) ..... :	***9,8 kV***	***P***
	Dielectric test, Uimp not indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm) :	***4,0 mm² / rigid / 8 – 9 mm***	—
	- rated insulation voltage (V) ..... :	***800 V***	—
	- test voltage for 60 sec (V) ..... :	***2000 V for 5 s According to IEC 60947-1 A2:2014; re-testing according to 60 s is not necessary***	***P***
8.4.5	Temperature-rise test		

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Clause	Requirement – Test	Result - Remark	Verdict
	Temperature-rise conditions:		
	- test current (A) ..... :	***32 A***	—
	- cross-section of the conductor (mm²) ..... :	***4 mm² rigid***	—
	- torque (Nm) ..... :	***-***	—
	- temperature-rise does not exceed 45 K	***max. 41 K***	***P***
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. ..... :	***3,2 A***	—
	- voltage drop (mV) before temperature-rise test not exceeding 3,2 mV ..... :	***0,91 mV -3,20 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 temperature-rise test not exceeding 150% of the value measured before temperature-rise test ..... :	***1,11 mV – 3,05 mV***	***P***
8.4.5	Temperature-rise test **on double deck terminal blocks 26 A (281-619)**		
	Temperature-rise conditions:		
	- test current (A) ..... :	***26 A***	—
	- cross-section of the conductor (mm²) ..... :	***4,0 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- temperature-rise does not exceed 45 K	***Upper level: 25 K – 33 K*** ***Lower level: 28 K – 31 K***	***P***
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. ..... :	***3,2 A***	—
	- voltage drop (mV) before temperature-rise test not exceeding 3,2 mV ..... :	***Upper level:*** ***1,30 mV – 2,10 mV*** ***Lower level:*** ***1,90 mV – 2,63 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
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test :	***Upper level:*** ***1,18 mV – 2,15 mV*** ***Lower level:*** ***1,96 mV – 2,71 mV***	***P***
8.4.5	Temperature-rise test **on double deck terminal blocks 24 A (281-619)**		
	Temperature-rise conditions:		
	- test current (A) ..... :	***24 A***	—
	- cross-section of the conductor (mm²) ..... :	***2,5 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- temperature-rise does not exceed 45 K	***Upper level: 31 K – 39 K*** ***Lower level: 35 K – 42 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 3,2 mV ..... :	***Upper level:*** ***0,83 mV – 0,98 mV*** ***Lower level:*** ***1,26 mV – 1,71 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 temperature-rise test not exceeding 150% of the value measured before temperature-rise test:	***Upper level:*** ***0,85 mV – 0,96 mV*** ***Lower level:*** ***1,30 mV – 1,78 mV***	***P***
8.4.5	Temperature-rise test: **on triple deck terminal blocks 20 A (281-530)**		
	Temperature-rise conditions:		
	- test current (A) ..... :	***20 A***	—
	- cross-section of the conductor (mm²) ..... :	***2,5 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- temperature-rise does not exceed 45 K	***Upper level: 23 K – 31 K*** ***Middle level: 23 K – 30 K*** ***Lower level: 22 K – 30 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. ..... :	***2,0 A***	—
	- voltage drop (mV) before temperature-rise test not exceeding 3,2 mV ..... :	***Upper level:*** ***0,89 mV – 1,40 mV*** ***Middle level:*** ***0,94 mV – 1,30 mV*** ***Lower level:*** ***1,33 mV – 1,67 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 temperature-rise test not exceeding 150% of the value measured before temperature-rise test ..... :	***Upper level:*** ***0,89 mV – 1,40 mV*** ***Middle level:*** ***0,88 mV – 1,41 mV*** ***Lower level:*** ***0,78mV – 1,01 mV***	***P***
8.4.5	Temperature-rise test		
	Temperature-rise conditions: **on four deck terminal blocks 25 A (281-530)**		
	- test current (A) ..... :	***25 A***	—
	- cross-section of the conductor (mm²) ..... :	***4,0 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- temperature-rise does not exceed 45 K	***max. 27 K***	***P***
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. ..... :	***3,2 A***	—
	- voltage drop (mV) before temperature-rise test not exceeding 3,2 mV ..... :	***1,19 mV – 2,78 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 temperature-rise test not exceeding 150% of the value measured before temperature-rise test ..... :	***1,25 mV – 2,89 mV***	***P***

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Clause	Requirement – Test	Result - Remark	Verdict
8.4.6	Short-time withstand current test **on through terminal blocks**		
	- rated cross-section of the conductor (mm²) ..... :	***4 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- test current (A) ..... :	***480 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. ..... :	***3,2 A***	—
	- voltage drop (mV) before short-time withstand current test not exceeding 3,2 mV ..... :	***0,96 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***
	- voltage drop (mV) after short-time withstand current test not exceeding 150% of the value measured before short-time withstand current test ..... :	***0,87 mV – 2,50 mV***	***P***
8.4.6	Short-time withstand current test **on disconnect terminal blocks 10 A (281-659)**		
	- rated cross-section of the conductor (mm²) ..... :	***4,0 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- test current (A) ..... :	***480 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. ..... :	***3,2A***	—

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Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) before short-time withstand current test not exceeding 3,2 mV ..... :	***2,90 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 short-time withstand current test not exceeding 150% of the value measured before short-time withstand current test ..... :	***3,00 mV***	***P***
8.4.6	Short-time withstand current test **on disconnect terminal blocks 16 A (281-624)**		
	- rated cross-section of the conductor (mm²) ..... :	***4,0 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- test current (A) ..... :	***480 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. ..... :	***3,2 A***	—
	- voltage drop (mV) before short-time withstand current test not exceeding 3,2 mV ..... :		***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	***1,08 mV***	***N***
	- voltage drop (mV) after short-time withstand current test not exceeding 150% of the value measured before short-time withstand current test ..... :	***1,25 mV***	***P***
8.4.6	Short-time withstand current test **(on disconnect terminal blocks 25 A (281-530)**		
	- rated cross-section of the conductor (mm²) ..... :	***4,0 mm²***	—
	- torque (Nm) ..... :	***-***	—

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Clause	Requirement – Test	Result - Remark	Verdict
	- test current (A) ..... :	***480 A***	—
	- duration of the test current (s) ..... :	***1s***	—
	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. ..... :	***3,2 A***	—
	- voltage drop (mV) before short-time withstand current test not exceeding 3,2 mV ..... :	***2,26 mV***	***P***
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV		***N***
	- voltage drop (mV) after short-time withstand current test not exceeding 150% of the value measured before short-time withstand current test ..... :	***2,22 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) ..... :	***4,0 mm² on request of manufacturer test carried out with flexible***	—
	Test current (A) according 8.4.5 ..... :	***40° C***	—
	Heating cabinet is increased, in each cycle to (°C) ..... :	***3,2 A***	—
	Test current (A) d.c. for measurement of the voltage drop ..... :	***40 °C /***	—
	Voltage drop after 0 cycles:		
	- requirement: ≤ 3,2 mV (mV) ..... :	***1,30 mV – 2,90 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
	Voltage drop after the 24th cycle:		
	- requirement: 4,8 mV (mV) ..... :	***1,22 mV – 2,80 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 – 3,30 mV***	***P***
	Voltage drop after the 72nd cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	***1,24 mV – 3,50 mV***	***P***
	Voltage drop after the 96th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	***1,22 mV – 3,60 mV***	***P***
	Voltage drop after the 120th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	***1,18 mV – 3,60 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 – 3,60 mV***	***P***
	Voltage drop after the 168th cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	***1,18 mV – 3,70 mV***	***P***
	Voltage drop after the 192nd cycle:		
	- requirement: ≤ 4,8 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	***1,15 mV – 3,60 mV***	***P***
	Pull-out test		
	force (N) ..... :	***60 N***	—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		***P***
8.5	Verification of thermal characteristics is checked by the needle flame test.		***P***
	Before the test, the terminal blocks are stored for 24 h in an atmosphere having a temperature between 15°C and 35°C and a relative humidity between 45%		***P***

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Clause	Requirement – Test	Result - Remark	Verdict
	and 75%		
	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.	***10 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 shall not ignite if burning or glowing particles fall from the terminal block.		***P***
8.6	Verification of EMC characteristics		
	Subclause 8.4 of IEC 60947-1 applies with the following addition:		***N***
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***

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Clause	Requirement – Test	Result - Remark	Verdict
Annex A	**vacant**		
Annex B	**informative**		
	Items subject to agreement between manufacturer and user		***N***
Annex C	**vacant**		
Annex D	**Additional requirements for test disconnect terminal blocks**		
D5	Product information **for types 281-624 and 781-613**		
	- service life in number of cycles	***200***	***P***
D6.	Normal service, mounting and transport conditions		
	Clause 6 applies.		***N***
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 measured over the open disconnect contacts (Gap). However, the rated impulse withstand voltage (Uimp) stated by the manufacturer according to table 13 of IEC 60947-1, without using the altitude correction factor, shall be verified across the open disconnect contacts (gap) (see D.7.2.2)	***6 kV (281-659 and 781-613)*** ***8 kV (281-624)***	***P***
D7.1.7	Disconnect unit		
	For longitudinal and perpendicular disconnection, test disconnect terminal blocks may be equipped with disconnect units, for instance of the following type: - plug - knife - slide (with or without busbar)	***Slide (781-613)*** ***Plug (281-624)*** ***Knife (281-659)***	***P***

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Clause	Requirement – Test	Result - Remark	Verdict
	the position of the disconnect unit shall be recognizable in normal use and shall not be changed unintentionally		***N***
D.7.2.2	Dielectric properties		
	Dielectric test, Uimp indicated: **type (281-659 and 781-613)**		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length tested over open disconnect contacts (gap) (mm) ..... :	***4,0 mm² rigid / 8 – 9 mm***	—
	- rated impulse withstand voltage (kV) ..... :	***6 kV***	—
	- test Uimp without altitude correction factor (kV) :	***6 kV***	***P***
	Dielectric test, Uimp indicated: **on type (281-624)**		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length tested over open disconnect contacts (gap) (mm) ..... :	***4,0 mm² rigid / 8 – 9 mm***	—
	- rated impulse withstand voltage (kV) ..... :	***8 kV***	—
	- test Uimp without altitude correction factor (kV) :	***8 kV***	P
D.8.4.5	Temperature-rise test		
	Temperature-rise conditions: **on type 281-624**		
	- 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	***12 K - 20 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 ..... :	***4 x 1,6 mV = 6,4 mV*** ***4,31 mV – 5,03 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***
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test ..... :	***4,38 mV – 5,29 mV***	***P***
	Temperature-rise conditions: **on type 281-659**		
	- 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	***6 K - 7 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 ..... :	***4 x 1,6 mV = 6,4 mV*** ***2,31 mV – 2,96 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***
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test ..... :	***2,26 mV – 2,56 mV***	***P***

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Temperature-rise conditions: **on type 781-613**		
	- test current (A) ..... :	***25 A***	—
	- cross-section of the conductor (mm²) ..... :	***4 mm²***	—
	- torque (Nm) ..... :	***-***	—
	- torque disconnect unit (Nm) ..... :	***-***	—
	- temperature-rise does not exceed 45 K	***22 K - 27 K***	***P***
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. ..... :	***3,2 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 ..... :	***4 x 1,6 mV = 6,4 mV*** ***1,61 mV – 1,94 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***
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test ..... :	***1,74 mV – 2,10 mV***	***P***
	Temperature-rise conditions: **on type 781-613**		
	- 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	***26 K - 31 K***	***P***
	Voltage drop before and after temperature-rise test:		
	- test current (A) d.c. ..... :	***2,4 A***	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) before temperature-rise test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points ..... :	***4 x 1,6 mV = 6,4 mV*** ***1,86 mV – 2,15 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***
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test ..... :	***1,83 mV – 2,24 mV***	***P***
D.8.4.6	Short-time withstand current test **type 281-659**		
	- 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 temperature-rise test not exceeding 1,6 mV times the total of conductor clamping unit and disconnect unit contact points ..... :	***4 x 1,6 mV = 6,4 mV*** ***2,36 mV***	***P***

IEC 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***
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test ..... :	***2,31 mV***	***P***
D.8.4.6	Short-time withstand current test **type 781-613**		
	- rated cross-section of the conductor (mm²) ..... :	***4 mm²***	—
	- torque (Nm) ..... :		—
	- torque disconnect unit (Nm) ..... :		—
	- test current (A) ..... :	***480 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. ..... :	***3,2 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 ..... :	***4 x 1,6 mV = 6,4 mV*** ***2,41 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***

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) after temperature-rise test not exceeding 150% of the value measured before temperature-rise test ..... :	***2,54 mV***	***P***
D.8.4.7	Ageing test for test disconnect terminal blocks with screwless-type clamping units		
	Maximum ambient temperature (°C) ..... :	40 °C /	—
	Rated cross-section rigid or stranded < 10 mm² solid, > 10 mm² stranded (mm²) ..... :		—
	Test current (A) according D.8.4.5 ..... :		—
	Torque disconnect unit (Nm) ..... :		—
	Heating cabinet is increased, in each cycle to (°C) ..... :		—
	Test current (A) d.c. for measurement of the voltage drop ..... :		—
	Voltage drop after 0 cycles:		
	- requirement: ≤ 1,6 mV (mV) ..... : the voltage drop is determined on each individual clamping unit separately	1 - 2 - 3 - 4 - 5 -	***N***
	Voltage drop after the 24th cycle:		
	- requirement: 2,4 mV (mV) ..... :	1 - 2 - 3 - 4 - 5 -	***N***
	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***
	Voltage drop after the 72nd cycle:		

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) ..... :	1 - 2 - 3 - 4 - 5 -	***N***
	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***
	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***
	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***
	Voltage drop after the 168th cycle:		
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) ..... :	1 - 2 - 3 - 4 - 5 -	***N***
	Voltage drop after the 192nd cycle:		

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- requirement: ≤ 2,4 mV or 1,5 times the value measured after the 24th cycle, whichever is the lower (mV) ..... :	1 - 2 - 3 - 4 - 5 -	***N***
	Pull-out test		
	force (N) ..... :		—
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		***N***
D.8.5.1	Service life **on Type 281-624**		
	- rated cross-section of the conductor (mm²) ..... :	***4 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. ..... :	***3,2 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 :	***4 x 1,6 mV = 6,4 mV*** ***3,86 mV – 4,51 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***
	- voltage drop (mV) after service life test not exceeding 150% of the value measured before service life test ..... :	***4,17 mV – 4,52 mV***	***P***
D.8.5.1	Service life **on Type 281-659**		
	- rated cross-section of the conductor (mm²) ..... :	***4 mm²***	—

IEC 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- torque (Nm) ..... :	**-**	—
	- torque disconnect unit (Nm) ..... :	**-**	—
	- number of operating cycles ..... :	***200 x***	—
	Entire test apparatus is stored for 168 h in dry heat at a temperature of 85 °C		***P***
	Voltage drop before and after service life		
	- test current (A) d.c. ..... :	***3,2 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 :	***4 x 1,6 mV = 6,4 mV*** ***3,13 mV – 3,38 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***
	- voltage drop (mV) after service life test not exceeding 150% of the value measured before service life test ..... :	***3,09 mV – 3,49 mV***	***P***
D.8.5.1	Service life **on Type 781-613**		
	- rated cross-section of the conductor (mm²) ..... :	***4 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. ..... :	***3,2 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 :	***4 x 1,6 mV = 6,4 mV*** ***1,61 mV – 1,71 mV***	***P***

IEC 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***
	- voltage drop (mV) after service life test not exceeding 150% of the value measured before service life test ..... :	***1,79 mV – 1,96 mV***	***P***
D.8.4.5	Emission		
	Terminal blocks within the scope of this standard are not sensitive of electromagnetic disturbances and therefore no immunity tests are necessary.		***N***
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***

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

8.4.2	TABLE: Clearance And Creepage Distance Measurements					
clearance cl and creepage distance dcr at/of:	**Up (V)**	**U r.m.s. (V)**	**Required cl (mm)**	**cl (mm)**	**required dcr (mm)**	**dcr (mm)**
281	**6 kV**	**(pol.degr. 3)** **250 V** **400 V** **500 V** **800 V**	**Case A: 5,5 mm** **Case B: 2,0 mm**	**> 5,5**	**3,2** **5,0** **6,3** **10,0**	**5,6** **13,8** **8,5** **10,3**
281-624	**8 kV**	**(pol.degr. 3)** **800 V**	**Case A: 8,0 mm** **Case B: 3,0 mm**	**> 10**	**10**	**> 12**
281-659	**6 kV**	**(pol.degr. 3)** **400 V**	**Case A: 5,5 mm** **Case B: 2,0 mm**	**> 9**	**5**	**> 9**
781-613	**6 kV**	**(pol.degr. 3)** **400 V**	**Case A: 5,5 mm** **Case B: 2,0 mm**	**> 7**	**5**	**> 7**
Supplementary information: tracking index 600 V group I						

8.4.3	TABLE: Dielectric Strength	
Test voltage applied between:	**Test potential applied (V)**	**Breakdown / flashover (Yes/No)**
281	**for 250 V = 2000 V** **for 400 V = 2500 V** **for 500 V = 3000 V** **for 800 V = 3500 V**	**No** **No** **No** **No**
281-659	**1890 V**	**No**
281-624	**2000 V**	**No**
781	**for 1000 V = 4000 V**	**No**
Supplementary information:		

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

8.4.5	**TABLE: Heating Test**		
	Test voltage (V):.....	**5 V**	—
	Ambient (^{o}C):	**20-25 °C**	—

Thermocouple Locations	max. temperature measured, (K)	max. temperature limit, (K)
281/781 with 32 A (4 mm^2)	**41**	45
281-619 with 26 A (4 mm^2)	**Upper level: 25 K – 33 K** **Lower level: 28 K – 31 K**	45
281-619 with 24 A (2,5 mm^2)	**Upper level: 31 K – 39 K** **Lower level: 35 K – 42 K**	45
281-531 with 20 A (2,5 mm^2)	**Upper level: 23 K – 31 K** **Middle level: 23 K – 30 K** **Lower level: 22 K – 30 K**	45
281-530 25 A (4 mm^2)	**all levels max. 27 K**	45

Supplementary information:

Remarks

Description of Types:

Product data of rail mounted through terminal blocks

rated insulation voltage (Ui)	:	800 V
conventional free air thermal current (Ith)	:	32 A
rated impulse withstand voltage	:	8 kV
types	:	281-... with suffixes -101, -102, -103, -104, -105, -191, -604, -601, -691, -901, -902, -903, -904, -905, -906, -991, -992
description	:	two-conductor through terminal block, 1-pole
types	:	281-... with suffixes -631, -651, -678, -679, -681, -684, -685, -686, -693, -695, -993, -998
description	:	three-conductor through terminal block, 1-pole
types	:	281-... with suffixes -652, -653, -654, -655, -663, -664, -668, -994
description	:	four-conductor through terminal block, 1-pole

Product data of rail mounted earth and shield terminal blocks

types	:	281-... with suffixes -107, -607, -637, -907, -108, -107/999-950, -607/999-950, -637/999-950, -907/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	281-... with suffixes -687, -687/999-950
description	:	three-conductor earth terminal block, 1-pole
types	:	281-... with suffixes -657, -657/999-950
description	:	four-conductor earth terminal block, 1-pole
type	:	281-658
description	:	four-conductor shield terminal block, 1-pole

Product data of double deck terminal blocks

types	:	281-... with suffixes -619, -620, -629, -630
rated insulation voltage (Ui)	:	500 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	26 A
description	:	two-conductor through/through terminal block, 2-poles

Product data of rail-mounted terminal blocks for wiring of electric motors

type	:	281-530
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	20 A, 2,5 mm² 25 A, 4,0 mm²
description	:	two-conductor through/through /through terminal block 3-poles one-conductor earth terminal block 1-pole

Remarks

type	:	281-531
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	20 A, 2,5 mm² 25 A, 4,0 mm²
description	:	two-conductor through/through terminal block, 2-poles

Product data of rail-mounted terminal blocks for wiring of electric motors (continued)

type	:	281-532
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	20 A, 2,5 mm² 25 A, 4,0 mm²
description	:	two conductor through/through/ through terminal block, 3-poles

Product data of disconnect terminal blocks

types	:	281-... with suffixes -666, -912
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	10 A
description	:	two-conductor disconnect terminal block, 1-pole

type	:	281-683
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	10 A
description	:	three-conductor disconnect terminal block, 1-pole

types	:	281-... with suffixes -659, -660
rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	10 A
description	:	four-conductor disconnect terminal block, 1-pole

Product data of carrier terminal blocks

rated insulation voltage (Ui)	:	400 V
rated impulse withstand voltage	:	6 kV
conventional free air thermal current (Ith)	:	10 A
types	:	281-... with suffixes -916, -917
description	:	two-conductor carrier terminal block, 1-pole

type	:	281-610
description	:	three-conductor carrier terminal block, 1-pole

type	:	281-656
description	:	four-conductor carrier terminal block, 1-pole

Remarks

Product data of carrier terminal block with disconnect plug

type	:	281-624
rated insulation voltage (Ui)	:	800 A
rated impulse withstand voltage	:	8 kV
conventional free air thermal current (Ith)	:	16 A
description	:	two-conductor carrier terminal block, 1-pole with disconnect plug; mechanical endurance: 50 operating cyclus, electrical endurance : 10 operating cyclus 2000 W at 220 Vac and 1000 W at 220 Vdc

Product data of diode and LED terminal blocks

types	:	281-... with suffixes -603, -915, -673, -665 and additional suffixes /281-400, /281-401, /281-410, /281-411
rated insulation voltage (Ui)	:	250 V
description	:	two- and four-conductor diode terminal block
types	:	281-... with suffixes -633/281-410, -633/281-411, -635/281-492, -635/281-491, -636/281-487, 636/281-488, -635/281-489, -635/281-490
rated insulation voltage (Ui)	:	250 V
description	:	double deck diode terminal block
types	:	281-... with suffixes -634/281-434, -634/281-413
rated insulation voltage (Ui)	:	24 V
description	:	double deck LED terminal block

Product data of rail mounted through terminal blocks

rated insulation voltage (Ui)	:	1000 V
conventional free air thermal current (Ith)	:	32 A
rated impulse withstand voltage	:	8 kV
types	:	781-... with suffixes -601, -604, -992
description	:	two-conductor through terminal block, 1-pole
types	:	781-... with suffixes -631, -651, -993
description	:	three-conductor through terminal block, 1-pole

Product data of a rail mounted earth terminal block

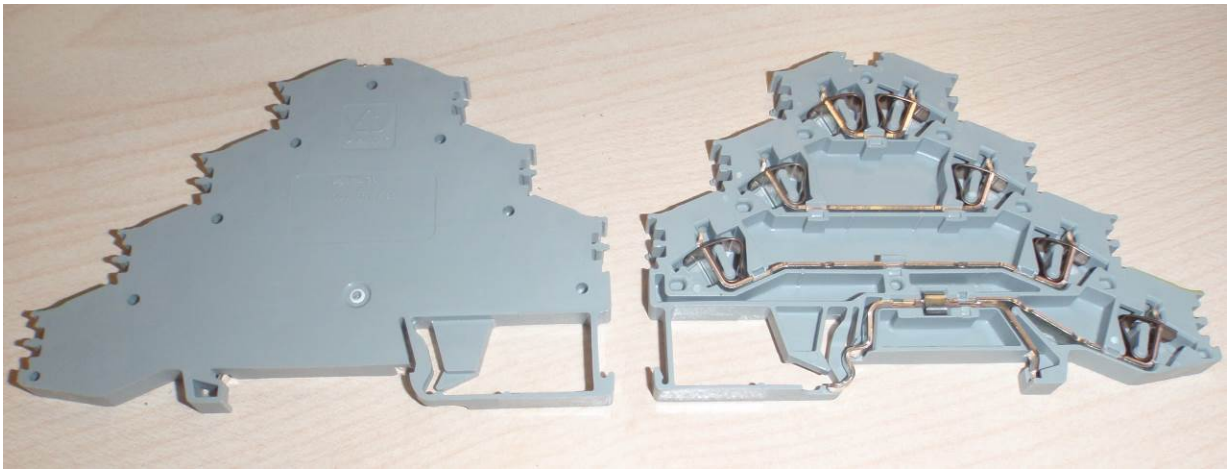
types	:	781-... with suffixes -607, -607/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	781-... with suffixes -637, -637/999-950
description	:	three-conductor earth terminal block, 1-pole

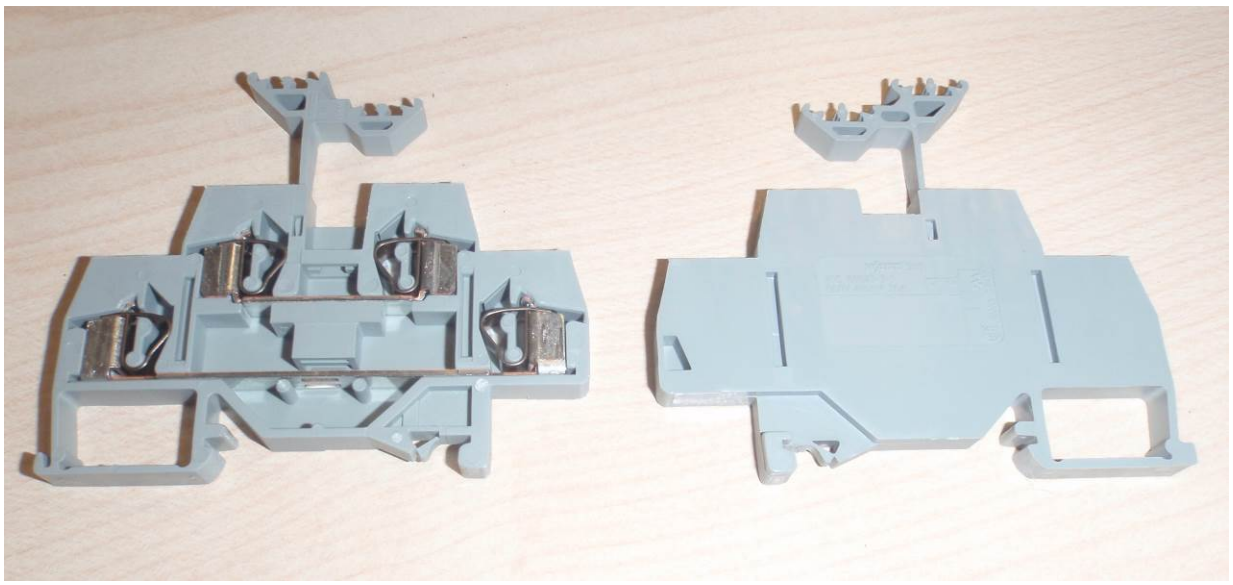
Remarks

Product data of a rail mounted neutral terminal block

rated insulation voltage (Ui)	:	400 V
conventional free air thermal current (Ith)	:	25 A
rated impulse withstand voltage	:	6 kV
types	:	781- … with suffixes -613, -623
description	:	one conductor through terminal block with neutral busbar connection of a busbar 3 x 10 mm, 1 pole
types	:	781-… with suffixes -643, -653
description	:	two conductor through terminal block with neutral busbar connection of a busbar 3 x 10 mm, 1 pole

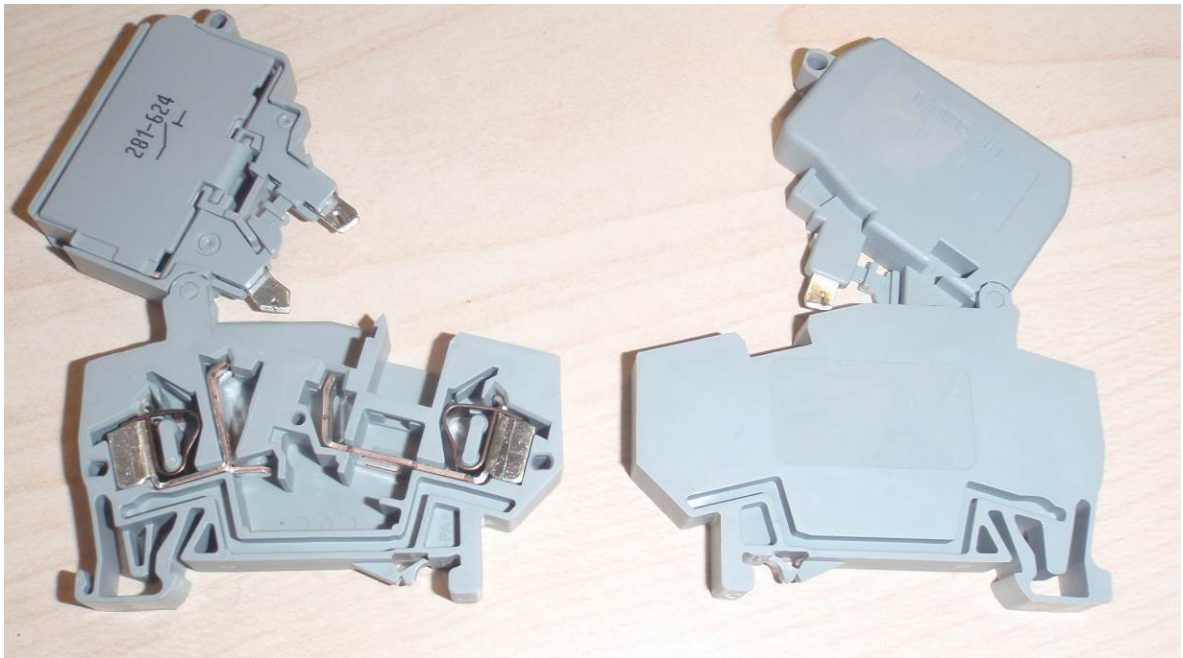
Remarks



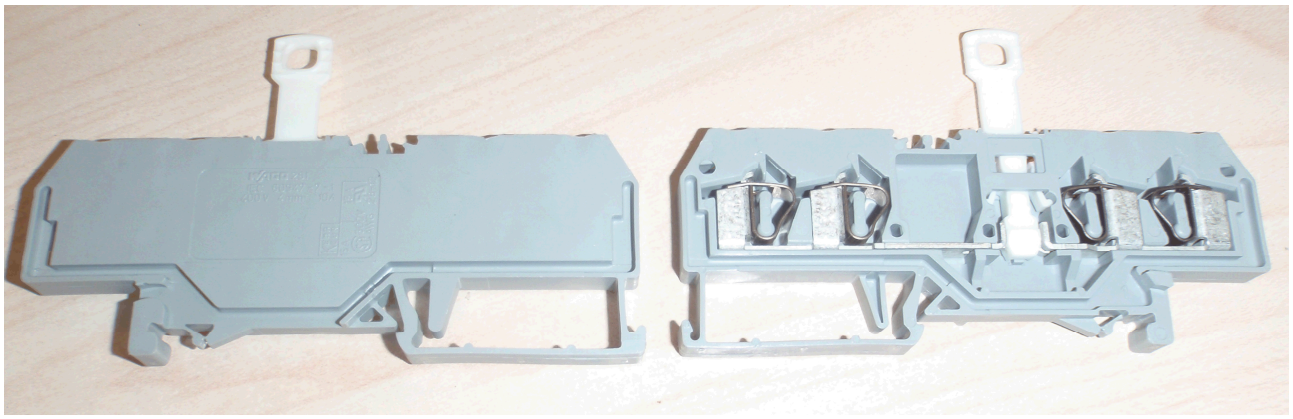


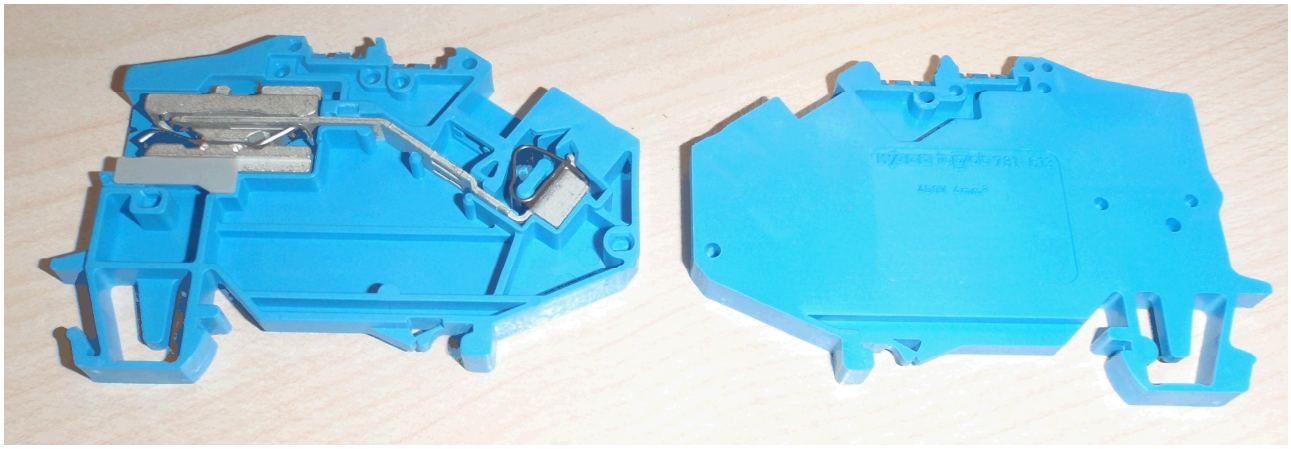
Remarks





Remarks





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Witnessed by (name + signature) .... :	
Approved by (name + signature) ..... :	**C.C. Burger**
Supervised by (name + signature) ... :	
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Address ..... :	**Meander 1051, 6825 MJ Arnhem, The Netherlands**
Applicant ..... :	**WAGO Kontakttechnik GmbH & Co. KG**
Address ..... :	**Hansastraße 27, 32423 Minden/Westfalen, Germany**
Manufacturer ..... :	**WAGO Kontakttechnik GmbH & Co. KG**
Address ..... :	**Hansastraße 27, 32423 Minden/Westfalen, Germany**
Product ..... :	**Protective terminal blocks for copper conductors**
Model/Type reference ..... :	**281 and 781**
Trademark ..... :	WAGO
Ratings ..... :	**4 mm², 24 V – 1000 V**

Certification Scheme ..... : ☐ ENEC ☒ CCA ☐ Other: _____

Standard(s) ..... : **EN 60947-7-2:2009 used in conjunction with EN 60947-1:2007**

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

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

This EN test report consists of the following parts:

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Test Report issued under the responsibility of:

DEKRA

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

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Applicant's name ..... :	**WAGO Kontakttechnik GmbH & Co. KG**
Address ..... :	**Hansastraße 27, 32423 Minden/Westfalen, Germany**
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Test procedure..... :	CB Scheme
Non-standard test method..... :	N/A
Test Report Form No. ..... :	IEC60947_7_2B
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The test results presented in this report relate only to the object tested.
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Test item description .....:	**Protective terminal blocks for copper conductors**
Trade Mark.....:	
Manufacturer .....:	**WAGO Kontakttechnik GmbH & Co. KG**
Model/Type reference .....:	**281 and 781**
Ratings .....:	**4 mm²**

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	**DEKRA Certification B.V.**	
Testing location/ address .....:		**Meander 1051, 6825 MJ Arnhem, The Netherlands**	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address .....:			
Tested by (name, function, signature) .....:		**W.C. van Ginkel**	
Approved by (name, function, signature) ..:		**C.C. Burger**	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address .....:			
Tested by (name, function, signature) .....:			
Approved by (name, function, signature) ..:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address .....:			
Tested by (name + signature).....:			
Witnessed by (name, function, signature).:			
Approved by (name, function, signature) ..:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address .....:			
Tested by (name, function, signature) .....:			
Witnessed by (name, function, signature).:			
Approved by (name, function, signature) ..:			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment): N/A

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
Complete investigation **<u>2160584.57 dated 5 March 2013</u>** **All tests are carried out on 781-607.** **<u>2187239.51 dated 15 October 2015</u>** **Additional tests are carried out on 281-607 and 281-530.** **<u>2233997.51 latest</u>** **Addition of type 281-917. No test necessary.**	**DEKRA Certification B.V.** **Meander 1051, 6825 MJ Arnhem, The Netherlands**

Summary of compliance with National Differences (List of countries addressed): N/A

☒ **The product fulfils the requirements of EN 60947-7-2: 2009.**

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



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Test item particulars..... :	
Classification of installation and use ..... :	**Protective terminal blocks for copper conductors**
Supply Connection ..... :	**N/A**
Particulars: test item vs. test requirements	
- method of fixing :	**mounting on top hat rail 35 mm**
- number of poles.....:	**1 pole to 4 poles**
- type of clamping unit.....:	**screwless terminal**
- ability to receive conductors .....:	**unprepared conductors, flexible or rigid**
- number of terminals on terminal assembly.....:	**2 and 3**
- PE or PEN functions.....:	**PE or PEN function**
- rated cross-section (mm²) .....:	**4 mm²**
- rated connecting capacity (mm²) .....:	**0,08 mm² - 4 mm² rigid and flexible**
Possible test case verdicts:	
- test case does not apply to the test object .....:	N
- test object does meet the requirement .....:	P (Pass)
- test object does not meet the requirement .....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	**02-2013 /10-2015**
Date (s) of performance of tests.....:	**02-2013 / 10-2015**
General remarks:	
"(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.**	

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....:	☒ **Yes** ☐ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) .....:

Wago Elwag
Innowacyjna 2
55-330 Wroblowice, Poland

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

Wago Pvt. Ltd.
C-27, Sector-58, Phase III
201301 Noida Uttar Pradesh, India

Wago Electronic (Tianjin) Co. Ltd.
No. 5 Quanhui Road
Wu Qing Development Area
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
CP 168
1564 Domdidier, Switzerland

General product information:

See page 24 and 25.

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
5	**PRODUCT INFORMATION**		
5.1	**Marking**		
	Terminal block shall be marked with:		
	- manufacturer's name or trademark	WAGO	**P**
	- type designation	**281 and 781**	**P**
5.2	The following information shall be stated by the manufacturer if applicable, e.g. in the manufacturer's data sheet, or his catalogue or on the packing unit:		
	- manufacturer's claim for compliance with IEC 60 947-7-2	**IEC 60947-7-2**	**P**
	- rated cross-section	**4 mm²**	**P**
	- rated connecting capacity	**0,08 mm² - 4 mm² rigid and flexible**	**P**
	- service conditions if different from those of Cl. 6.		**P**
	The manufacturer shall declare if the protective conductor terminal block rated equal to or above 10 mm^2 (AWG 8) is intended for PE function only.		**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**

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	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**
	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**
7.1.4	Terminal identification and marking:		

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	- 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 - 4 mm² rigid and flexible**	**P**
7.1.7	Protective conductor mounting rails		
	Mounting rails may be used as protective conductor busbars, provided the values specified in Table A.1 for thermal short-time withstand current and the thermal rated current are not exceeded	**Top hat rail 35 mm**	**P**
	Other types of mounting rails may be used for this purpose if the values of Table A.1 are comparable		**N**
	Steel protective conductor busbars are not allowed to be used as a PEN conductor		**N**

8.	**TESTS**		
8.3	**Verification of mechanical characteristics**		
8.3.2	Attachment of the terminal block on its support		
	mounting rail ..... :	**Top hat rail 35 mm**	—
	torque (Nm) clamping to support ..... :	**-**	—

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	steel pin diameter (mm) ..... :	**1,0 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 strength of clamping units		
8.2.4.2	Mechanical strength of terminals (IEC 60947-1)		
	rated cross-section of a rigid conductor (mm²) ... :	**4 mm²**	—
	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) ... :	**4 mm²**	—
	test current (A) d.c. ..... :	**3,2 A**	—
	voltage drop (mV) before mechanical strength test not exceeding 3,2 mV ..... :	**1,22 mV – 2,80 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**
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test ..... :	**1,25 mV – 2,58 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 ..... :	**0,35 mV – 0,65 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**

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	voltage drop (mV) after mechanical strength test not exceeding 150% of the value measured before mechanical strength test ..... :	**0,35 mV – 0,80 mV**	**P**
	Mechanical strength of the clamping to support		
	- rail profile ..... :	**Top hat rail 35 mm**	—
	diameter of thread (mm) ..... :	**-**	—
	torque (Nm) ..... :	**-**	—
	5 times on 2 separate clamping units		**P**
	rated cross-section of a rigid conductor (mm²) ... :	**4 mm²**	**—**
	test current (A) d.c. ..... :	**3,2 A**	**—**
	voltage drop (mV) before mechanical strength test not exceeding 6,4 mV ..... :	**1,95 mV – 2,11 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 ..... :	**1,88 mV – 2,14 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		

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	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) ..... :	**4 mm²**	—
	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) ..... :	**279 mm**	—
	mass at the conductor(s) (kg) ..... :	**0,9 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) ..... :	**60 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) ..... :	**4 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) ..... :	**279 mm**	—
	mass at the conductor(s) (kg) ..... :	**0,9 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) ..... :	**60 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) ..... :	**4 mm²**	—
	number of conductor of the largest cross-section :	**1**	—

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Clause	Requirement – Test	Result - Remark	Verdict
	diameter of bushing hole (mm) ..... :	**9,5 mm**	—
	height between the equipment and the platen (mm) ..... :	**279 mm**	—
	mass at the conductor(s) (kg) ..... :	**0,9 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) ..... :	**60 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) ..... :		—
	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		

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	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)	**1,5 mm²**	**P**
8.4.3	Dielectric tests		
	Dielectric test, Uimp indicated: **Type 281-532**		
	- 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) ..... :	**4,0 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) :	**4,0 mm² / rigid / 8 - 9 mm**	—
	- rated insulation voltage (V) ..... :	**400 V**	—
	- test voltage for 60 sec (V) ..... :	**1890 V tested for 5 s** According to IEC 60947-1 A2:2014 re-testing according to 60 s is not necessary	**P**
8.4.3	Dielectric test, Uimp indicated: **Type 281-652 with 281-607**		
	- 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) ..... :	**4,0 mm² / rigid / 8 - 9 mm**	—
	- rated impulse withstand voltage (kV) ..... :	**8 kV**	—
	- test Uimp main circuits (kV) ..... :	**9,8 kV**	**P**

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	Dielectric test, Uimp not indicated:		
	- five terminal blocks connected with unfavourable cross-section (mm²) / type / conductor end length (mm):	**4,0 mm² / rigid / 8 – 9 mm**	—
	- rated insulation voltage (V) ..... :	**800 V**	—
	- test voltage for 60 sec (V) ..... :	**2000 V for 5 s** According to IEC 60947-1 A2:2014; re-testing according to 60 s is not necessary	***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-rise without support		
	- temperature-rise does not exceed 45 K		**N**
	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 ..... :		**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 ..... :		**N**
	Temperature-rise with support		
	- rail profile and material ..... :		—

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Clause	Requirement – Test	Result - Remark	Verdict
	- temperature-rise does not exceed 45 K ..... :		—
	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 ..... :		**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 ..... :		**N**
8.4.6	Short-time withstand current test type		
	- cross-section of the conductor (mm²) ..... :	**4 mm²**	—
	- torque (Nm) clamping unit ..... :	**-**	—
	- rail profile and material ..... :	**Top hat rail 35 mm**	—
	- torque (Nm) clamping to support ..... :	**-**	—
	Test current from clamping unit to clamping unit (1-1)		
	- test current (A) ..... :	1 – **480 A** 2 – **480 A** 3 – **480 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) ..... :	**4 mm²**	—
	- test current (A) d.c. ..... :	**3,2 A**	—

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Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop (mV) after short-time withstand current test not exceeding 3,2 mV ..... :	1 – **1,90 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 – **480 A** 2 – **480 A** 3 – **480 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) ..... :	**4 mm²**	—
	- test current (A) d.c. ..... :	**3,2 A**	—
	- voltage drop (mV) after short-time withstand current test not exceeding 6,4 mV ..... :	1 – **2,15 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 ambient temperature (°C) ..... :	**40° C**	—
	Rated cross-section solid or stranded (mm²) ..... :	**4 mm²**	—
	Heating cabinet is increased, in each cycle to (°C) ..... :	**85° C**	—
	Test current (A) d.c. for measurement of the voltage drop ..... :	**3,2 A**	—

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Clause	Requirement – Test	Result - Remark	Verdict
	Rail profile and material ..... :	**Top hat rail 35 mm, Cu**	—
	Torque (Nm) clamping to support ..... :	**-**	—
	Voltage drop after 0 cycles:		
	- requirement for clamping unit to clamping unit: ≤ 3,2 mV (mV) ..... :	**1,30 mV – 2,90 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**
	- requirement for clamping unit to support: ≤ 6,4 mV (mV) ..... :	**1,46 mV - 3,96 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) ..... :	**1,22 mV – 2,80 mV**	**P**
	- requirement for clamping unit to support: 9,6 mV (mV) ..... :	**2,04 mV – 3,58 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 – 3,30 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 – 3,67 mV**	**P**

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Clause	Requirement – Test	Result - Remark	Verdict
	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) ..... :	**1,24 mV – 3,50 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,62 mV – 3,37 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) ..... :	**1,22 mV – 3,60 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,51 mV – 3,32 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) ..... :	**1,18 mV – 3,60 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,13 mV – 3,30 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 – 3,60 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,16 mV – 3,32 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) ..... :	**1,18 mV – 3,70 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) ..... :	**1,16 mV – 3,39 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) ..... :	**1,15 mV – 3,60 mV**	**P**
	- requirement for clamping unit to support: ≤ 9,6 mV or 1,5 times the value measured after the 24th cycle (mV) ..... :	**1,05 mV – 3,26 mV**	**P**
	Pull-out test		
	force (N) ..... :	**60 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 shall not ignite if burning or glowing particles fall from the terminal block.		**P**
8.6	**Verification of EMC characteristics**		
	Subclause 8.4 of IEC 60947-1 applies with the		**N**

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict
	following addition		
8.6.1	Immunity		**N**
	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		**N**
	Terminal blocks within the scope of this standard do not generate electromagnetic disturbances and therefore no emission tests are necessary.		**N**

IEC 60947-7-2			
Clause	Requirement – Test	Result - Remark	Verdict

8.4.3	TABLE: Dielectric Strength		
Test voltage applied between:		**Test potential applied (V)**	**Breakdown / flashover (Yes/No)**
1,3 and 5 to 2 and 4		**2000 V**	**No**
All terminals to support		**2000 V**	**No**
Supplementary information:			

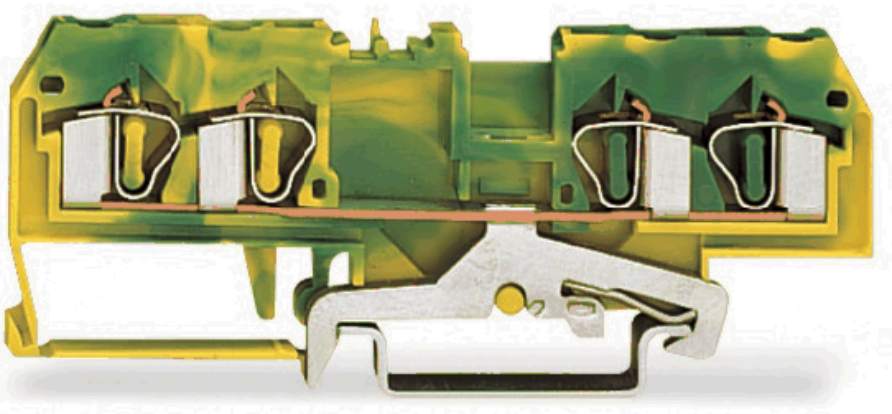
Description of types

Product data of rail mounted earth and shield terminal blocks

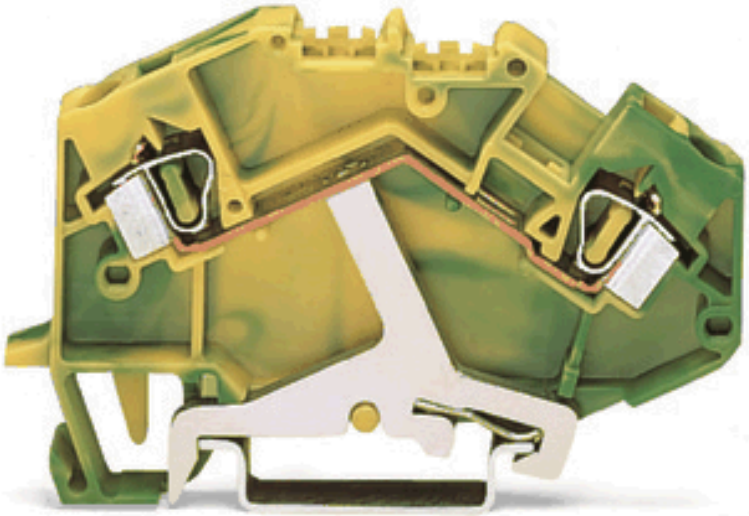
types	:	281-... with suffixes -107, -607, -637, -907, -108, -107/999-950, -607/999-950, -637/999-950, -907/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	281-... with suffixes -687, -687/999-950
description	:	three-conductor earth terminal block, 1-pole
types	:	281-... with suffixes -657, -657/999-950
description	:	four-conductor earth terminal block, 1-pole
type	:	281-658
description	:	four-conductor shield terminal block, 1-pole

product data of a rail mounted earth terminal block

types	:	781-... with suffixes -607, -607/999-950
description	:	two-conductor earth terminal block, 1-pole
types	:	781-... with suffixes -637, -637/999-950
description	:	three-conductor earth terminal block, 1-pole



Type 281-657



Type 781-607