

CERTIFICATE

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

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

Product(s) : splicing wire connector
Trade name(s) : WAGO
Type(s)/model(s) : 221

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 60998-2-2:2004;
- an inspection of the production location according to CENELEC Operational Document CIG 021
- a certification agreement with the number 2074495

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

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

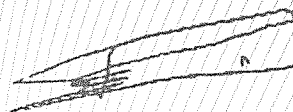
This certificate is issued on: 13 February 2014 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 2168803.01

DEKRA Certification B.V.



drs. G.J. Zoetbrood
Managing Director



F.S. Strikwerda
Certification Manager

© Integral publication of this certificate is allowed

ACCREDITED BY THE
DUTCH ACCREDITATION
COUNCIL



SPECIFICATION OF THE CERTIFIED PRODUCT**Product data**

product	:	splicing wire connector
trade name(s)	:	WAGO
type(s)	:	221-412, 221-413, 221-415
material	:	thermoplastic material
rated connecting capacity	:	4 mm ²
connectable conductors	:	0,14 mm ² flexible 0,2 - 4 mm ² flexible and rigid
rated current	:	32 A
rated voltage	:	450 V
t-rating	:	85 C
type	:	221 with suffixes -412, -413, -415
description	:	screwless type clamping units, 1-pole, last number of the suffix indicates the number of clamping units

Additional information

Markings: Trademark, type designation and electric ratings are printed at the thermoplastic material.

Product data - type 221-412**Product data - type 221-413****TESTS****Test requirements**

EN 60998-2-2:2004

Test result

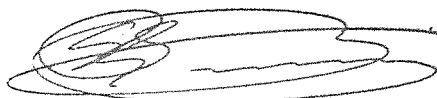
The test results are laid down in DEKRA test file 2168803.01.

Conclusion

The examination proved that all test requirements were met.

Tested by : J. Olbrich (Wago)

Checked by : H.L. Schendstok



Factory locations

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

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

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

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

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

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






OD ECS 040-1
ed. April 2010

Test Report summary issued under the responsibility
of:



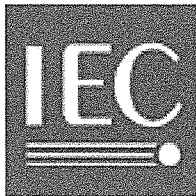
CCA TEST REPORT Summary

Report Reference No.	2168803.50
Date of issue	12 February 2014
Tested by (name + signature)	J. Olbrich 
Witnessed by (name + signature)	
Approved by (name + signature)	A. Bauer 
Supervised by (name + signature)	H.L. Schendstok 
Testing Laboratory	DEKRA Certification B.V.
Address	Meander 1051, 6825 MJ Arnhem , The Netherlands
Testing procedure	<input type="checkbox"/> ENEC/CCA-TL <input type="checkbox"/> TMP <input type="checkbox"/> WMT <input checked="" type="checkbox"/> SMT
Testing location	WAGO Kontakttechnik GmbH
Address	Hansastraße 27, Minden, Germany
Applicant	WAGO Kontakttechnik GmbH
Address	Hansastraße 27, Minden, Germany
Manufacturer	WAGO Kontakttechnik GmbH
Address	Hansastraße 27, Minden, Germany
Product	splicing wire connector
Model/Type reference	221
Trademark	WAGO
Ratings	450 V 32 A
Test procedure	<input type="checkbox"/> ENEC <input checked="" type="checkbox"/> CCA <input type="checkbox"/> Other: _____
Standard(s)	EN 60998-2-2:2004 used in conjunction with EN _____:
<input type="checkbox"/>	The text of the a.m. European Standard was approved by CENELEC under the Unique Acceptance Procedure and is identical to the corresponding IEC Publication.
<input checked="" type="checkbox"/>	The text of the a.m. European Standard was approved by CENELEC with agreed common modifications and is <u>not</u> identical to the corresponding IEC Publication.
This EN test report consists of the following parts:	
<input checked="" type="checkbox"/>	IEC TRF No. : 2168803.50
<input checked="" type="checkbox"/>	EN Common modifications : Page 23 and 24
<input checked="" type="checkbox"/>	SNCs and A-deviations : Annex ZB page 24
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If this Test Report Form is used by non-ECS Members, the ECS logo and the reference to the ENEC/CCA procedures shall be removed. This report is not valid as an ENEC/CCA Test Report unless signed by an approved ENEC/CCA Testing Laboratory and appended to an ENEC Licence or CCA Notification of Test Results issued by a CB being member of ECS.	

EN TEST REPORT			
Clause	Requirement + Test	Result - Remark	Verdict

Annex ZB	SPECIAL NATIONAL CONDITIONS		P

Annex ____	NATIONAL DEVIATIONS		N

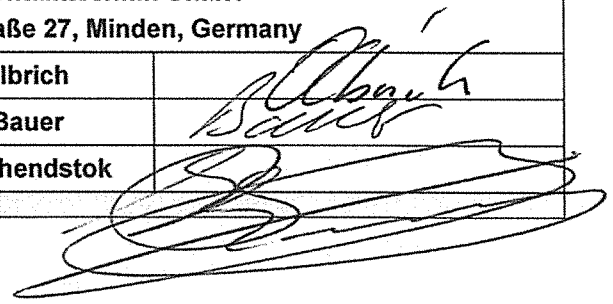


Test Report issued under the responsibility of:



TEST REPORT IEC 60998-2-2:2004 Connecting devices for low voltage circuits for household and similar purposes Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units	
Report Reference No.....:	2168803.50
Date of issue.....:	12 February 2014
Total number of page.....:	25
Applicant's name.....:	WAGO Kontakttechnik GmbH
Address.....:	Hansastraße 27, Minden, Germany
Test specification:	
Standard	IEC 60998-2-2 (see also IEC 60 998-1:2002)
Test procedure.....:	CB Scheme
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC60998_2_2B
Test Report Form(s) Originator	DEKRA certification B.V.
Master TRF	Dated 2012-02
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Test item description.....:	splicing wire connector
Trade Mark	WAGO
Manufacturer.....:	WAGO Kontakttechnik GmbH
Model/Type reference.....:	221
Ratings.....:	450 V 32 A

Testing procedure and testing location:		
<input type="checkbox"/>	CB Testing Laboratory:	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature)		
<input type="checkbox"/>	Testing procedure: TMP	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature)		
<input type="checkbox"/>	Testing procedure: WMT	
Testing location/ address		
Tested by (name + signature).....:		
Witnessed by (name + signature)		
Approved by (name + signature)		
<input checked="" type="checkbox"/>	Testing procedure: SMT	
Testing location/ address		WAGO Kontakttechnik GmbH Hansastraße 27, Minden, Germany
Tested by (name + signature).....:		J. Olbrich
Approved by (name + signature)		A. Bauer
Supervised by (name + signature)....:		H.L. Schendstok



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

Summary of testing:

Tests performed (name of test and test clause):

Complete type-testing

**Tests are carried out on type
221-412, 221-413, 221-415**

Testing location:

**WAGO Kontakttechnik GmbH
Hansastraße 27, Minden, Germany**

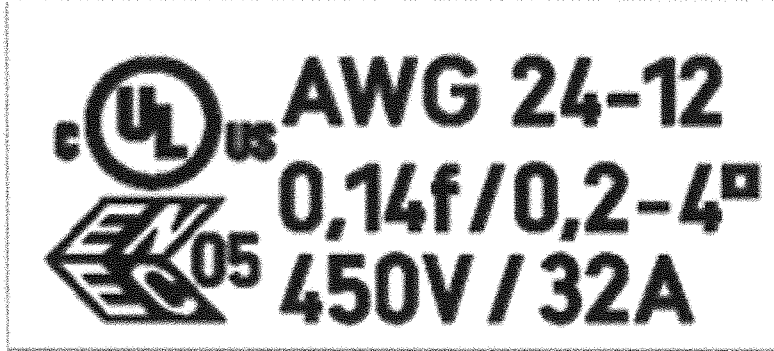
Summary of compliance with National Differences

List of countries addressed:

The product fulfils the requirements of _____ (insert standard number and edition and delete the text in parenthesis or delete the whole sentence if not applicable)

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.

WAGO

Test item particulars:	
Number of terminals.....:	<input checked="" type="checkbox"/> single <input type="checkbox"/> multiway
Protection against electric shock.....:	<input checked="" type="checkbox"/> with <input type="checkbox"/> without
Means of fixing.....:	<input type="checkbox"/> with <input checked="" type="checkbox"/> without
Rated temperature.....:	<input type="checkbox"/> without T marking <input checked="" type="checkbox"/> with T marking (85°C)
IP number.....:	IP-
Type of terminals, screwless-type.....:	<input checked="" type="checkbox"/> universal non-universal <input type="checkbox"/> push wire
Conductor type.....:	<input checked="" type="checkbox"/> rigid <input checked="" type="checkbox"/> flexible
Rated connecting capacity.....:	<input checked="" type="checkbox"/> 0,14mm ² "f" <input checked="" type="checkbox"/> 0,2mm ² <input checked="" type="checkbox"/> 4mm ² <input type="checkbox"/> 1,5mm ²
Conductor insulation.....:	<input type="checkbox"/> 2,5mm ² <input type="checkbox"/> 4mm ² <input type="checkbox"/> 6mm ² <input type="checkbox"/> 10mm ² <input type="checkbox"/> 16mm ² <input type="checkbox"/> 25mm ² <input type="checkbox"/> 35 mm ²
Rated voltage (V ac / V dc).....:	<input checked="" type="checkbox"/> AC <input type="checkbox"/> DC
Classification of installation and use.....:	
Supply Connection	
.....:	
Possible test case verdicts:	
- test case does not apply to the test object.....: N/A	
- test object does meet the requirement.....: P (Pass)	
- test object does not meet the requirement.....: F (Fail)	
Testing	
Date of receipt of test item.....: 2014-02	
Date (s) of performance of tests	
.....: 2014-02	
General remarks:	
The test results presented in this report relate only to the object tested.	
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.	
"(see Enclosure #)" refers to additional information appended to the report.	
"(see appended table)" refers to a table appended to the report.	
Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.	

Manufacturer's Declaration per sub-clause 6.2.5 of IEC60947-2:

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)

General product information:**Factory locations:**

WAGO Kontakttechnik GmbH
Hansastraße 27, Minden, Germany

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

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

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

Wago-Kontakttechnik GmbH & Co. KG
Hansastraße 27, 32423, Minden/westfalen
Germany

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

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

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
8	MARKING		
8.1	On main part:		
	a) rated connecting capacity (mm ²).....:	0,14 mm² "F" 0,2 mm² - 4 mm²	P
	b) rated insulation voltage (V)	450 V	P
	c) T marking (°C) (if > 40 °C or < -5 °C).....:	85 °C	P
	d) type reference	221-415 example	P
	e) manufacturer's or responsible vendor's name, trademark or identification mark.....:	WAGO	P
	f) IP if > IP20		N
	Small devices: only d) and e) indicated on device		N
	All marks visible on smallest package unit		P
8.101	Type of acceptable conductor "s" "r" or "f"		P
8.102	Marking indicating the length of insulation to be removed before insertion of the conductor		P
8.2	Multiway terminal devices: at least two adjacent		N
8.3	When symbols are used they shall be as follow: V for volts mm ² or □ for square millimetres T for T-rating		P
8.4	Marking: durable and easily legible; 15 s water; 15 s hexane		P
9	PROTECTION AGAINST ELECTRIC SHOCK		
	Live parts not accessible		P

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
10	CONNECTION OF CONDUCTORS		
10.1	Connecting devices allow correct connection of conductors		P
10.101	Connection or disconnection: use a general tool or simple insertion	lever operated	P
	Disconnection operation other than a pull	lever operated	P
10.102	Terminals accept two or more conductors of same or different nominal cross-sectional areas; see table 101 (as specified by manufacturer):		P
	Universal terminals shall accept rigid(solid or stranded) and flexible unprepared conductors		P
	Non-universal terminals shall accept the types of conductors declared by the manufacturer		P
	Rated connecting capacity (mm ²)	0,14 mm ² "f" 0,2 mm ² - 4 mm ²	P
	Suitable for connecting cross-sectional areas (mm ²)	0,14 mm ² "f" 0,2 mm ² - 4 mm ²	P
10.103	Terminals accept rigid and flexible conductors (table 101), unless otherwise specified (see 8.1)		P
	Smallest diameter (mm); largest diameter (mm)	0,42 mm, 2,7 mm	P
	During the test: terminals show no damage		P
10.104	Terminals clamp the conductor without undue damage:		
10.104.1	Connection/disconnection 5 times: smallest diameter (mm)	0,14 mm ² "f"	P
	Connection/disconnection 5 times: largest diameter (mm)	4 mm ²	P
	After the test, terminal not damaged		P
10.104.2	Rated cross-sectional area (mm ²)	4 mm ²	P
	Type	rigid and flexible	P
	After the test, no wire of conductor escaped outside the terminal		P
10.105	Secureness test:		
	during the test: the conductor does not slip out, no break near clamping unit and no damage	See appended table 10.105	P
10.106	Pull test:		
	- during the test the conductor does not come out	See appended table 10.106	P

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
11	CONSTRUCTION		
11.101	Contact pressure not transmitted via insulating material, unless there is sufficient resiliency		P
11.102	Insertion and disconnection, in accordance with manufacturer's instructions		P
	Openings clearly distinguishable		P
11.103	Terminals so constructed that:		
	- each conductor is clamped individually		P
	- conductors can be connected or disconnected at same time or separately	separately	P
	Possible to clamp maximum number of conductors	1	P
11.104	Inadequate insertion of conductor avoided		P
11.2	Clamping units clamp conductors reliably and between metal surfaces		P
11.3	Connecting devices: insulation of conductors not in contact with live parts of different polarity		P
11.4	Insulating lining: adequate mechanical strength and secured in a reliable manner		P
11.5	Current-carrying parts: adequate mechanical strength, electrical conductivity and resistance to corrosion; type of metal	tin plated copper	P
	Current-carrying parts not made with electroplated coating if subjected to mechanical wear		N
11.6	Terminals: possible to connect number of conductors as specified by the manufacturer:		
	- number of conductors	1	P
	- rigid, cross-sectional area (mm ²)	0,2 mm² - 4 mm²	P
	- flexible, cross-sectional area (mm ²)	0,14 mm² - 4 mm²	P
11.7	Fixing means of bases do not serve any other purpose		P

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

12	RESISTANCE TO AGEING, TO HUMIDITY CONDITIONS, TO INGRESS OF SOLID OBJECTS AND TO HARMFUL INGRESS OF WATER		
12.1	Connecting devices resistant to ageing; after the test (168 h): no cracks visible, not sticky or greasy, no damage; test temperature (°C).....:	<input type="checkbox"/> 85 °C <input checked="" type="checkbox"/> T + 30 °C=115 °C	P
12.2	After humidity test (91-95%): no damage; test duration (168 h for connecting devices > IPx2, 48 h for all other)	48 h	P
12.3	IP test (IEC 60529)	IP__	N
	After the test, electric strength test as 13.4, and by inspection	IP__	N
	no appreciable entry of water		N

13	INSULATION RESISTANCE AND ELECTRIC STRENGTH		
13.1	Insulated connecting devices provided with adequate insulation resistance and electric strength		P
13.2	Insulation between the connected conductors and the external surface is adequate for all the combinations of conductors		P
13.3	Insulation resistance measured 1 min after application of 500 V d.c.	See appended table 13.3	P
13.4	Electric strength test	See appended table 13.4	P

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
14	MECHANICAL STRENGTH		
14.101	the test conductor, properly inserted into a clamping unit of the connection devices shall be allowed to be bent (deflected) in all 12 directions each of them differing from the adjacent directions by 30° ± 5°		
	Deflection test (principle of test apparatus shown in figure 103a):		
	- requirement: ≤ 2,5 mV	See appended table 14.101	P
	max measured voltage drop (mV)	0,62 mV	P
14.2	Tumbling barrel (for < 50 g): 50 falls; after the test no damage	4,15 g	P
14.3	Impact test (for > 50 g): 10 blows:		
	- height of fall: 7,5 cm		N
	- height of fall: 10 cm		N
	- height of fall: 20 cm		N
	- height of fall: 25 cm		N
	After the test, no damage and live parts shall not become accessible		N
15	TEMPERATURE RISE		
	requirement: ≤ 45K		P
	max measured temperature rise (K)	See appended table 15	P
15.101	192 temperature cycles test, each cycle with a duration of 1 h, with the test current as defined in Table 2 of Part I		P
	Cabinet temperature (°C)	<input type="checkbox"/> 40 <input checked="" type="checkbox"/> T-marking: 85 °C	P
	Maximum voltage drop did not exceed 22,5 mV or 1,5 times 24 th cycle value	See appended table 15.101	P

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
16	RESISTANCE TO HEAT		
16.1	Connecting devices are sufficiently resistant to heat		P
16.2	Heating cabinet test	See appended table 16.2	P
	After the test: no changes impairing further use and markings still legible		P
16.3	Ball-pressure test (IEC 60695-10-2) for parts necessary to retain current-carrying parts and parts of the earthing circuit in position	See appended table 16.3A	P
	Impression diameter not exceed 2 mm		P
	Ball-pressure test (IEC 60695-10-2) for parts not necessary to retain current-carrying parts and parts of the earthing circuit in position	See appended table 16.3B	N
	Impression diameter not exceed 2 mm		N
17	CLEARANCES AND CREEPAGE DISTANCES		P
	Creepage distances, clearances and distances through sealing compound	See appended table 17	P
18	RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT AND FIRE		
	Glow-wire test (clauses 4 to 10 of IEC 60695-2-10)	See appended table 18	P
	No visible flames and no sustained glowing or flame and glowing extinguished within 30 s		P
	No ignition of the tissue paper or scorching of the board		P
19	RESISTANCE OF INSULATING MATERIAL TO TRACKING		
	Tracking test (IEC 60112): PTI 175 V, 50 drops, solution A	See appended table 19	P

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

10.105	TABLE: Clamping securement and damage to the conductor test					
	Model/type reference.....: 221					
No of sample	Conductor cross-sectional area (mm ²)	Conductor type	Mass for conductor (kg)	Height H (mm)	Diameter of bushing hole (mm)	
1	0,14	Flexible	0,1	260	6,4	P
2	0,2	rigid flexible	0,1	260	6,4	P
3	4	rigid flexible	0,9	280	9,5	P
4						
5						
6						
Supplementary information:						
10.106	TABLE: Pull-out test					
	Model/type reference.....:					
No of sample	Conductor cross-sectional area (mm ²)	Conductor type	Pull force (N)			
1	0,14	flexible	10			P
2	0,2	rigid flexible	10			P
3	4	rigid flexible	60			P
4						
5						
6						
Supplementary information:						

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

13.3	TABLE: Insulation resistance		
	Model/type reference.....:	221	
	Smallest cross-sectional area (mm ²) :	0,14 mm ² "f" / 0,2 mm ² "r"	
	Largest cross-sectional area (mm ²) :	4 mm ² "r"	
	Test voltage applied between	Measured (MΩ)	Required (MΩ)
	All clamping units together and the body	>20 MΩ	5 MΩ
	Each clamping unit and all others together		
Supplementary information:			

13.4	TABLE: Electric strength test		
	Model/type reference.....:	221	
	Rated insulation voltage (V).....:	450 V	
	Test voltage applied between	Test voltage (V)	Flashover / breakdown (Yes/No)
	All clamping units together and the body	2500 V	No
	Each clamping unit and all others together		
Supplementary information:			

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

14.101	TABLE: Mechanical strength				
	0,1 times the test current (A)	0,2 A			P
	smallest cross-sectional area (mm ²) 10.103	0,14 mm²			P
	force (N) (table 104)	0,09 N			P
	Distance (mm) (table 104)	100 mm			P
	-screwless terminal number	1	2	3	-
	- voltage drop measured (mV) (1 st deflection)	0,39	0,38	0,39	P
	- voltage drop measured (mV) (2 nd deflection)	0,39	0,38	0,38	P
	- voltage drop measured (mV) (3 rd deflection)	0,39	0,38	0,38	P
	- voltage drop measured (mV) (4 th deflection)	0,38	0,39	0,38	P
	- voltage drop measured (mV) (5 th deflection)	0,38	0,39	0,38	P
	- voltage drop measured (mV) (6 th deflection)	0,39	0,39	0,38	P
	- voltage drop measured (mV) (7 th deflection)	0,38	0,39	0,39	P
	- voltage drop measured (mV) (8 th deflection)	0,39	0,39	0,39	P
	- voltage drop measured (mV) (9 th deflection)	0,39	0,39	0,39	P
	- voltage drop measured (mV) (10 th deflection)	0,38	0,39	0,39	P
	- voltage drop measured (mV) (11 th deflection)	0,38	0,39	0,39	P
	- voltage drop measured (mV) (12 th deflection)	0,39	0,39	0,39	P
	- requirement: ≤ 2,5 mV				P

IEC 60998-2-2					
Clause	Requirement + Test	Result - Remark			Verdict
14.101	TABLE: Mechanical strength				
	0,1 times the test current (A)	0,4 A			P
	smallest cross-sectional area (mm ²) 10.103	0,2 mm²			P
	force (N) (table 104)	0,09 N			P
	Distance (mm) (table 104)	100 mm			P
	-screwless terminal number	1	2	3	-
	- voltage drop measured (mV) (1 st deflection)	0,42	0,43	0,43	P
	- voltage drop measured (mV) (2 nd deflection)	0,45	0,44	0,44	P
	- voltage drop measured (mV) (3 rd deflection)	0,46	0,45	0,45	P
	- voltage drop measured (mV) (4 th deflection)	0,45	0,45	0,45	P
	- voltage drop measured (mV) (5 th deflection)	0,46	0,44	0,45	P
	- voltage drop measured (mV) (6 th deflection)	0,46	0,45	0,45	P
	- voltage drop measured (mV) (7 th deflection)	0,45	0,45	0,44	P
	- voltage drop measured (mV) (8 th deflection)	0,46	0,46	0,45	P
	- voltage drop measured (mV) (9 th deflection)	0,45	0,45	0,45	P
	- voltage drop measured (mV) (10 th deflection)	0,46	0,46	0,45	P
	- voltage drop measured (mV) (11 th deflection)	0,45	0,45	0,45	P
	- voltage drop measured (mV) (12 th deflection)	0,46	0,45	0,45	P
	- requirement: ≤ 2,5 mV				P

IEC 60998-2-2					
Clause	Requirement + Test	Result - Remark			Verdict
14.101	TABLE: Mechanical strength				
	0,1 times the test current (A)	3,2 A			P
	smallest cross-sectional area (mm ²) 10.103	4 mm²			P
	force (N) (table 104)	2 N			P
	Distance (mm) (table 104)	100 mm			P
	-screwless terminal number	1	2	3	-
	- voltage drop measured (mV) (1 st deflection)	0,62	0,57	0,60	P
	- voltage drop measured (mV) (2 nd deflection)	0,61	0,60	0,60	P
	- voltage drop measured (mV) (3 rd deflection)	0,57	0,54	0,54	P
	- voltage drop measured (mV) (4 th deflection)	0,54	0,54	0,55	P
	- voltage drop measured (mV) (5 th deflection)	0,61	0,58	0,56	P
	- voltage drop measured (mV) (6 th deflection)	0,60	0,57	0,55	P
	- voltage drop measured (mV) (7 th deflection)	0,60	0,58	0,59	P
	- voltage drop measured (mV) (8 th deflection)	0,61	0,60	0,59	P
	- voltage drop measured (mV) (9 th deflection)	0,61	0,60	0,60	P
	- voltage drop measured (mV) (10 th deflection)	0,59	0,58	0,58	P
	- voltage drop measured (mV) (11 th deflection)	0,59	0,58	0,59	P
	- voltage drop measured (mV) (12 th deflection)	0,58	0,58	0,58	P
	- requirement: ≤ 2,5 mV				P

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

15	TABLE: Temperature rise		
	Model/type reference.....	221-415	
	Terminal	<input checked="" type="checkbox"/> single <input type="checkbox"/> multiway	—
	T marking (°C)	<input checked="" type="checkbox"/> Yes (85°C):	—
	Largest cross-sectional area (mm ²).....	4 mm²	
	Conductors	rigid and flexible	
	Rated connecting capacity (mm ²).....	4 mm²	
	Test current (A).....	32 A	
	Thermocouple Locations	max. temperature measured, (°C)	max. temperature limit, (°C)
	On conductor in the terminal T1	21	45 K
	On conductor in the terminal T2	22	45 K
	On conductor in the terminal T3	21	45 K
	On conductor in the terminal T4	22	45 K
	On conductor in the terminal T5	22	45 K
Supplementary information:			

IEC 60998-2-2					
Clause	Requirement + Test	Result - Remark			Verdict
15.101	TABLE: Temperature-cycling test				
	Model/type reference	221-415			
	Smallest cross-sectional area (mm ²)	0,14 mm² flexible			
	Test current (Table 2) (A)	2 A			
Measured voltage drop of:		Measured voltage drop (mV)			
		Sample 1	Sample 2	Sample 3	
Solid conductors	(after 24 cycles)				
Stranded conductors	(after 24 cycles)				
Flexible conductors	(after 24 cycles)	1,31	1,40	1,36	P
Solid conductors	(1,5 times 24 th cycle value)				
Stranded conductors	(1,5 times 24 th cycle value)				
Flexible conductors	(1,5 times 24 th cycle value)	1,96	2,10	2,04	P
Solid conductors	(after 192 cycles)				
Stranded conductors	(after 192 cycles)				
Flexible conductors	(after 192 cycles)	0,89	1,01	0,99	P
	Largest cross-sectional area (mm ²)	4 mm² rigid flexible			
	Test current (Table 2) (A)	32 A			
Measured voltage drop of:		Measured voltage drop (mV)			
		Sample 1	Sample 2	Sample 3	
Solid conductors	(after 24 cycles)	2,31	2,10	2,00	P
Stranded conductors	(after 24 cycles)	2,12	2,23	2,10	P
Flexible conductors	(after 24 cycles)	2,00	2,50	2,64	P
Solid conductors	(1,5 times 24 th cycle value)	3,46	3,15	3,00	P
Stranded conductors	(1,5 times 24 th cycle value)	3,18	3,34	3,15	P
Flexible conductors	(1,5 times 24 th cycle value)	3,00	3,75	3,96	P
Solid conductors	(after 192 cycles)	1,85	1,83	1,87	P
Stranded conductors	(after 192 cycles)	1,79	1,81	1,80	P
Flexible conductors	(after 192 cycles)	2,00	2,50	2,64	P
Supplementary information:					

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

15.101	TABLE: Temperature-cycling test				
	Model/type reference	221-415			
	Smallest cross-sectional area (mm ²)	0,2 mm ² rigid flexible			
	Test current (Table 2) (A)	4 A			
	Measured voltage drop of:	Measured voltage drop (mV)			
		Sample 1	Sample 2	Sample 3	
	Solid conductors (after 24 cycles)	1,72	1,54	1,71	P
	Stranded conductors (after 24 cycles)				
	Flexible conductors (after 24 cycles)	1,79	1,79	2,10	P
	Solid conductors (1,5 times 24 th cycle value)	2,58	2,31	2,56	P
	Stranded conductors (1,5 times 24 th cycle value)				
	Flexible conductors (1,5 times 24 th cycle value)	2,68	2,68	3,15	P
	Solid conductors (after 192 cycles)	1,48	1,27	1,26	P
	Stranded conductors (after 192 cycles)				
	Flexible conductors (after 192 cycles)	1,28	1,14	1,89	P

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

16.2	TABLE: Heating cabinet test			
	Test temperature (°C).....:	<input type="checkbox"/> 85°C <input checked="" type="checkbox"/> T + 45 = 130 °C		
	Model/type reference	Sample 1	Sample 2	Sample 3
	221-413	P	P	P
Supplementary information:				

16.3A	TABLE: Ball pressure test of insulating materials			
	Test temperature (°C).....:	<input type="checkbox"/> 125 <input checked="" type="checkbox"/> T + 45 = 130 °C		
	Part under test	Material designation / manufacturer	Impression diameter (mm)	
	Housing	Xantar	1 mm	P
	lever	Celanex	1 mm	P
	lever	Ultradur	1 mm	P
Supplementary information:				

16.3B	TABLE: Ball pressure test of insulating materials			
	Test temperature (°C).....:	<input type="checkbox"/> 70 <input type="checkbox"/> T + 40 =		
	Part under test	Material designation / manufacturer	Impression diameter (mm)	N
Supplementary information:				

17	TABLE: Clearances and creepage distances				
	Rated insulation voltage (V).....:	450 V			P
	Clearance cl, creepage distance cr and distance through sealing compound tsc at/of:	Required cl, cr, tsc (mm)	Measured cl (mm)	Measured cr (mm)	Measured tsc (mm)
	Between clamping units				
	Clamping units - surface	4	4,05	4,07	-
Supplementary information:					

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

18	TABLE: Glow-wire test		
Part under test	Material designation / manufacturer	Test temperature (°C)	Time of extinguish of flames and glowing, if any
housing and lever	Xantar / Celanex / Ultradur	850°C	flame extinguished immediately after removal.
Supplementary information:			

19	TABLE: Tracking		
Part under test	Material designation / manufacturer	Test voltage (V)	Remarks
housing	Xantar	175 V	P
lever	Celanex	175 V	P
lever	Ultradur	175 V	P
Supplementary information:			

IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

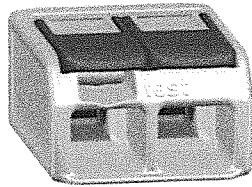
ATTACHMENT TO TEST REPORT IEC 60998-2-2 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES			
Connecting devices for low voltage circuits for household and similar purposes Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units			
Differences according to : EN 60998-1 : 2004 and EN 60998-2-2 : 2004 in conjunction with IEC 60998-1 : 2002 and IEC 60998-2-2 : 2002			
Attachment Form No. : EU_GD_IEC60998_2_2B			
Attachment Originator : DEKRA certification B.V.			
Master Attachment : Date (2013-02)			
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EN 60998-1			
CENELEC COMMON MODIFICATIONS			
1	Scope		
delete	In the first paragraph ", and equivalent AWG conductors".		P
6.2	Main characteristics		
delete	NOTE 1		P
8.3	Marking		
delete	the NOTE		P
11.6	Construction		
delete	", or equivalent AWG conductors".		P
15.4	Temperature rise		
delete	the NOTE		P
Annex	B		
delete	The whole annex		P

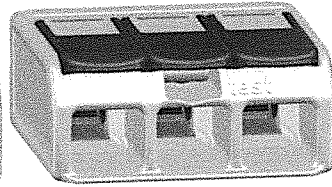
IEC 60998-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
EN 60998-2-2 CENELEC COMMON MODIFICATIONS			
10.103	Connection of conductors		
delete	NOTE 1		P
delete	In Table 101, NOTE 2, "and for AWG conductors, on ASTM B172-71, ICEA publication S-19-81, ICEA Publication S-66-524 and ICEA Publication S-65-516."		
10.105			
delete	NOTE 1 and NOTE 2		P
10.106			
delete	NOTE 1 and NOTE 2		P
14.101	Mechanical strength		
delete	the NOTE		P
Annex	BB		
delete	The whole annex		P

ANNEX ZB (normative) SPECIAL NATIONAL CONDITIONS (EN 60998-1)			
<p>Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.</p> <p>NOTE If it affects harmonization, it forms part of the European Standard.</p> <p>For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.</p>			
Clause			
6.2	United Kingdom		
Replace	The entire subclause by: 6.2 The standard rated connecting capacities are 0,2 mm ² , 0,34 mm ² , 0,5 mm ² , 0,75 mm ² , 1 mm ² , 1,25mm ² , 1,5 mm ² , 2,5 mm ² , 4 mm ² , 6 mm ² , 10 mm ² , 16 mm ² , 25 mm ² , and 35 mm ²		P

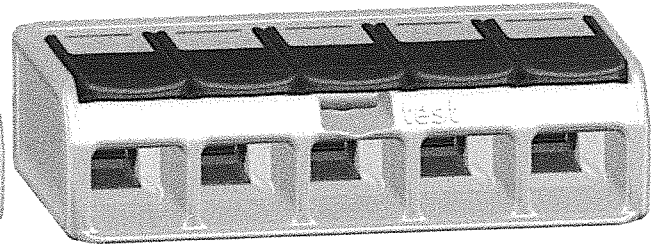
Remarks



221-412



221-413



221-415