1.0 SCOPE

1.1. Content:

This specification covers performance, tests and quality requirements ding rail Screw type fuse Terminal Block connector according to IEC60947-7-3(Edition 2.0 2009-04) standard. Applicable product descriptions and part numbers are as shown on product drawing.

1.2. Qualification:

When tests are performed on the subject product line, procedures specified shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2.0 APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1 TE Connectivity Documents:

114-137172: Application Specification for ding rail Screw type fuse Terminal Block Connector

501-137182: Qualification Test Report for ding rail Screw type fuse Terminal Block Connector

3.0 REQUIREMENTS

3.1 Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2 Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.4 Ratings

A. Voltage: see table 10

B. Current: see table 10 .

B. Wire Size: see table 10

C. Operating Temperature: -40 to 105℃

D. Storage Environment:

Temperature: - 25℃ to 40℃ Relative humidity: 15%-70%

3.5 Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements. Unless otherwise specified, all tests shall be performed in the room temperature (5～35℃), relative humidity (45～85％), air pressure (86～106kPa), and special case temperature (18～22℃), relative humidity (60～70％), unless otherwise specified.

3.6 Test Requirements and Procedures Summary

3.6.1 Examination:

Test Description	Requirement	Procedure
Examination of the product	Meets visual requirements.	Visual inspection per product drawing. Per EIA-364-18

3.6.2 ELECTRICAL

Test Description	Requirement	Procedure
8.4.3 Impulse Withstanding Voltage	There shall be no unintentional disruptive discharge during the tests.	Each test shall be carried out on five adjacent terminal blocks wired and installed on a metal support. Rated impulse voltage see table 10. The test equipment shall be calibrated to produce a 1,2/50 μs waveform as defined in IEC 61180. The output is then connected to the equipment to be tested and the impulse applied five times for each polarity at intervals of 1 s minimum. Apply the impulse Voltage value(refer to the value of the sea level list of **table 12 of IEC60947-1**) between: 1>the live parts of adjacent fuse terminal blocks of same series and size; 2> the live parts of different polarity; 3> the live parts connected together and the support 4>The contact elements of each fuse terminal block Item 1,2,3 should insert Gauge No.1,Item 4 should insert Gauge No.3 and Indicators shall be removed or disconnected during this test. **Per IEC60947-7-3 section 8.4.3**
8.4.3 Dielectric Withstanding Voltage	During the test, no flashover, breakdown of insulation either internally (puncture) or externally (tracking) or any other manifestation of disruptive discharge shall occur. Any glow discharge shall be ignored.	Each test shall be carried out on five adjacent terminal blocks wired and installed on a metal support. The test voltage shall have a practically sinusoidal waveform and a frequency between 45 Hz and 65 Hz. The test voltage shall be applied to for 60 s.The power-frequency withstand test voltage (**table 12A of IEC60947-1**) corresponding to the rated insulation voltage (Ui)(see **table 10**) of the terminal block base shall be applied between: 1>the live parts of adjacent fuse terminal blocks of same series and size; 2> the live parts of different polarity; 3> the live parts connected together and the support 4>The contact elements of each fuse terminal block Item 1,2,3 should insert Gauge No.1,Item 4 should insert Gauge No.3. **Per IEC60947-7-3 section 8.4.3**
8.4.4 Contact Resistance	The mean value of the contact resistance shall not exceed 10 mΩ. The value of an individual measurement shall not exceed 15 mΩ.	The contact resistance shall be measured after the fuse terminal block has been equipped with gauge no.2 according to Table A.1. The contact resistance is normally calculated from the voltage drop measured according to **Figure 1**. The complete measurement consists of five measuring cycles which shall be carried out successively. One measuring cycle comprises the following: a) insertion of the gauge in the fuse terminal block; b) measurement with current flowing in one direction; c) measurement with current flowing in the opposite direction; d) removal of the gauge from the fuse terminal block. The measurement shall be made under the following conditions: a) test voltage: the open-circuit voltage of the current source shall not exceed 60 V d.c. but shall be at least 10 V; b) test direct current: 0,1 A; c) the measurement shall be made within 1 min following the application of the test current; d) the measurement shall be carried out so that unusual pressure on the contacts being tested and a displacement of the test conductors are avoided. **(Per IEC60947-7-3 section 8.4.4)**

8.5.2.3 Rated power dissipation------ Test arrangement for exclusive short-circuit protection	The temperature values measured shall not exceed the two values specified in 7.2.3.1(the temperature of 85 °C on the surface of the actuating elements of the fuse-carrier and the relative temperature index (RTI) of the insulating material as stated by the manufacturer in accordance with IEC 60216-1 shall not be exceeded.)	**a.Separate arrangement** Test arrangement according to 8.5.2.2 of IEC60947-7-3, Figure 2, equipped with dummy fuse-link of power dissipation value PV2. **b.Compound arrangement** Five fuse terminal blocks shall be installed on a support as in normal use together with the necessary accessories.The wiring shall be made as shown in Figure 4. All five fuse terminal blocks shall be equipped with dummy fuse-links of power dissipation value PV2 according to Table 2 OF iec60947-7-3. **Wire condition:** Conductors shall be connected to the fuse terminal blocks or adjacent feed-through terminal blocks as follows: a) length: 1 m; b) cross-section of a solid copper conductor: − 1 mm^2 for fuse terminal blocks designed up to and including 6,3 A, test current 6,3 A; − 1,5 mm^2 for fuse terminal blocks designed over 6,3 A up to and including 10 A, test current 10 A; − 2,5 mm^2 for fuse terminal blocks designed over 10 A up to and including 16 A; test current 16 A; c) insulation: black. The conductors shall be tightened with a torque according to Table 4 of IEC 60947-1 or alternatively in accordance with the higher torque value stated by the manufacturer. A thermocouple or another measuring method which has no essential influence on the temperature shall be applied for measuring the temperature of the part being tested. **Dummy fuse-link for cartridge fuse-links:** A dummy fuse-link is a test fuse-link with defined resistance according to Table 2.The material of the resistance wire used in the dummy fuse-link shall be of CuNi44 or any similar material having a temperature coefficient of resistance of less than ± 8,0 × 10–5 K–1 within the temperature range of 20 °C to 200 °C. The dimensions of the dummy fuse-links are specified in Table A.1. These dimensions are equivalent to the dimensions of the minimum gauges No. 2 or No. 5, except for the permissible tolerances. **Temperature measuring point:** The temperature shall be measured by approximation at the hottest point of the insulating part of the fuse terminal block (TS2) and the surface of the actuating element of the fuse-carrier (TS1). In case of doubt, said points shall be determined by a preliminary test. End cap material: brass, nickel plated; minimum thickness of nickel plating 2 µm. Test procedure : The dummy fuse-links provided for the test (separate arrangement and compound arrangement) shall be selected from Table 2 of IEC60947-7-3 and inserted into the fuse terminal block. The currents for the fuse terminal blocks being tested shall be so adjusted that the given maximum power dissipation values PV1 and/or PV2, according to Table 2, are reached in conformity with the test arrangement of 8.5.2.2 and 8.5.2.3 of IEC60947-7-3. The rated values shall remain constant during the whole testing duration. The test shall be continued until the temperature balance is reached. The temperature balance is reached when three successive readings, which shall be made at an interval of at least 5 min, do not show any further temperature rise. The measured results,determined at ambient temperature, shall be rectified to a reference temperature of 23 °C by means of a derating curve corresponding to the example shown in Annex B of IEC60947-7-3. **Per IEC60947-7-3 8.5.2.3**

Test Description	Requirement	Procedure
8.4.5 Temperature rise of clamping units	The temperature rise should be 45ºC Max.	Five fuse terminal blocks shall be installed side by side on a support according to **Figure 1** as in normal use, together with the required accessories and the minimum gauge no. 2 inserted according to **Table A.1**. The tightening torque shall be in accordance with **Table 4** of IEC 60947-1 or alternatively in accordance with the higher torque value stated by the manufacturer (see table 10). The test shall be carried out with single-phase a.c. current and continued until constant temperature values are reached. A variation of less than 1 K between any two out of three consecutive measurements made at an interval of 5 min is considered as steady temperature. Conductors shall be connected to the fuse terminal blocks or adjacent feed-through terminal blocks as follows: a) length: 1 m; b) cross-section of a solid copper conductor: − 1 mm2 for fuse terminal blocks designed up to and including 6,3 A, test current 6,3 A; − 1,5 mm2 for fuse terminal blocks designed over 6,3 A up to and including 10 A, test current 10 A; − 2,5 mm2 for fuse terminal blocks designed over 10 A up to and including 16 A; test current 16 A; c) insulation: black. The current and wire size refer to table 10. **(Per IEC60947-7-3 section 8.4.5)**
8.5.3 **Durability**	After the test, the fuse terminal block shall show no changes impairing its function as in normal use. The following requirements shall be met: − dielectric tests according to 8.4.3 of iec60947-7-3; − contact resistance test according to 8.4.4; the mean value shall not exceed 10 mΩ and the value of an individual measurement shall not exceed 15 mΩ; − compatibility test between fuse terminal block and fuse-link according to 8.3.4.of IEC60947-7-3	Fuse terminal blocks shall be resistant to heat and mechanical stresses which are liable to occur in normal use. Moreover, the requirements of 8.5.2 shall be taken into consideration. Compliance with these requirements is checked by the following test. The fuse terminal block shall be subjected to the test for separate arrangement according to 8.5.2.2.1 or 8.5.2.3.1 of IEC60947-7-3, as applicable. The rated current related to the corresponding dummy fuse-link according to Table 2 shall be passed through the test arrangement (see examples below). The test shall be carried out continuously over a period of 168 h. EXAMPLE 1 For an overload and short-circuit protection PV declared 2,5 W, 5 mm × 20 mm fuse-link: use a dummy fuse-link with 6,3 A and a power dissipation of 2,5 W. EXAMPLE 2 For an exclusively short-circuit protection PVK declared 2,5 W, 5 mm × 20 mm fuse-link: use a dummy fuse-link with 6,3 A and a power dissipation of 1 W. Per IEC60947-7-3 section 8.5.3

3.6.3 Mechanical

Test Description	Requirement	Procedure
8.3.2 Attachment of the terminal block on its support	During the test, no terminal block shall work free from its rail or support, nor suffer any other damage.	The test shall be made on two clamping units at the centre terminal block out of five terminal blocks mounted as in normal use on the appropriate support according to the manufacturer´s instructions. A steel pin of 150 mm length and of a diameter as specified in Table 3 is clamped successively in each clamping unit. The tightening torque shall be in accordance with Table 4 of IEC 60947-1 or, alternatively, in accordance with the higher torque value stated by the manufacturer (see **table 10**). A force corresponding to the values of **Table 1** is applied to the pin regularly and without shocks at a distance of 100 mm from the centre of the clamping unit, according to **Figure 5**. **Per IEC60947-7-3 section 8.3.2**

8.3.3.1 Mechanical properties of clamping units of a fuse terminal block---- Mechanical strength of clamping units	During the test, clamping units and terminals shall not work loose and there shall be no damage, such as breakage of screws or damage to the head slots, threads, washers or stirrups that will impair the further use of the screwed connections.	Tests shall be made on two clamping units at the centre terminal block out of five terminal blocks mounted as in normal use on the appropriate support according to the manufacturer's instructions with the appropriate type of conductor having the maximum cross-section,The conductor shall be connected and disconnected five times. For screw-type terminals, the tightening torque shall be in accordance with **Table 4** of IEC 60947-1or 110 % of the torque specified by the manufacturer (see **table 10**), whichever is the greater. The test shall be conducted on two separate clamping units. Each time the clamping screw or nut is loosened, a new conductor shall be used for each tightening test. Rigid conductors of the rated Max. cross-section shall be connected and disconnected five times. **Per IEC 60947-7-3 section 8.3.3.1**
8.3.3.2 Mechanical properties of clamping units of a fuse terminal block----- Damage to and accidental loosening of conductors of a fuse terminal block-(flexion test)	During the test, the conductor shall neither slip out of the terminal nor break near the clamping unit. Pass pullout force test	Each test shall be carried out on two clamping units of one terminal block. The tightening torque shall be in accordance with **Table 4** of IEC 60947-1 or alternatively in accordance with the higher torque value stated by the manufacturer. The tests shall be made with the type (rigid and/or flexible) and the number of conductors stated by the manufacturer as follows: − with the different types of conductor of the specified smallest cross-section (only one conductor connected); − with the different types of conductor of the specified rated cross-section (only one conductor connected); Test value for secureness test should follow **table 3** Equipment refer to **figure 6**. **Per IEC 60947-7-3 section 8.3.3.2**
8.3.3.3 Mechanical properties of clamping units of a fuse terminal block----- Pull out test	During the test, the conductor shall neither slip out of the terminal nor break near the clamping unit.	The pull out force (refer to **table 3**) should be applied in one smooth and continuous application, for 1 min, in the direction of the axis of the conductor. Using the max. size and Min. size wire(solid and stranded) refer to **table 10** , the wire should be stranded for 10mm^2(8AWG) and larger size. Wire should be connected to connector with rated torque (see **table 10**). **(Per IEC60947-7-3 section 8.3.3.3)**
8.3.3.4 Mechanical properties of clamping units of a fuse terminal block----- Rated cross-section and rated connecting capacity	The required wire can be inserted unhindered in the opened clamping unit and be connected.	The test shall be carried out on each clamping unit of one terminal block. **For conductors of the rated cross-section and for terminal blocks with a rated connecting capacity up to 35 mm^2**, one conductor of the two next smaller cross-sections shall be inserted unhindered in the opened clamping unit and be connected. The wire size should refer to **table 10**. Per IEC60947-7-3 section 8.3.3.4
8.3.4 Compatibility between fuse terminal blocks and the fuse-link	The mean value of the contact resistance shall not exceed 10 m Ω . The value of an individual measurement shall not exceed 15 m Ω .	The maximum gauge no. 1 or no. 4, in accordance with Table A.1, shall be inserted and withdrawn 10 times from the fuse-carrier. Following each insertion of the gauge, the fuse-carrier shall be fitted to the terminal block base as in normal operation. No visible damage or loosening of parts shall be observed. The minimum gauge no. 2 or no. 5, according to Table A.1, shall be prevented from falling out of the fuse-carrier in the most unfavourable position. The minimum gauge no. 2 or no. 5 shall then be inserted into the fuse terminal block and the contact resistance be measured according to 8.4.4 (see Figure 1). **Per IEC60947-7-3 section 8.3.4**

8.3.5.3 Mechanical strength of the connection between the terminal block base and the fuse-carrier--- Actuating forces on plug-on type or hinged-type fuse-carriers	The value of each individual measurement shall be within the limit values as stated by the manufacturer (25N Max.). The fuse-carrier shall be securely kept in the terminal block base during and after the test, and shall show no change impairing its normal use.	The fuse-carrier, together with the maximum gauge no. 1 or no. 4 according to Table A.1, shall be inserted in and withdrawn from or slewed out of the terminal block base. The actuating forces shall be measured with appropriate measuring means. This test shall be conducted 10 times. **Per IEC60947-7-3 section 8.3.5.3**

3.6.4 Environmental

Test Description	Requirement	Procedure
8.5.4 Needle flame test	Duration of burning denotes the time interval from the moment the flame is removed until flames or glowing of the terminal block have extinguished. The terminal blocks are considered to have passed the test if the duration of burning is <30 s 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.	The test is carried out according to IEC 60695-11-5 successively in the area of one clamping unit of three fuse terminal blocks. The test room shall be substantially draught-free with dimensions sufficient to ensure an adequate supply of air. Before the test, the fuse 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 %. After this preconditioning, the fuse terminal block is mounted on its appropriate support and fixed with suitable means so that one lateral insulation wall lies parallel to the layer placed below it (see **Figure 7**). Conductors are not connected. The layer placed below, which consists of an approximately 10 mm thick pinewood board covered with a single layer of tissue paper (grammage between 12 g/m2 to 30 g/m2 according to 4.215 of ISO 4046-4:2002, is positioned at a distance of (200 ± 5) mm below the fuse terminal block.The test flame, adjusted in accordance with **Figure 1a**) of IEC 60695-11-5, is guided under an angle of 45° to the lateral insulation wall. The tip of the flame shall make contact with the insulation wall in the area of the clamping unit (see **Figure 8**). 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. After the flame is removed, the duration of burning in the case of ignition is measured. **Per IEC60947-7-3 section 8.5.4**

NOTE

1. For IEC test items: The rated cross-section is below 10 mm^2 (AWG 8), the conductors shall be solid. For rated cross-sections equal to or higher than 10 mm^2 (AWG 8), the conductors shall be rigid stranded.
2. *Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.*
3. *All the wire should be connected with the specified torque. Detail torque specification should refer to table 10.*

3.6.5 Product Qualification and Requalification Test Sequence

Subclause of IEC60947-7-3	Test group	A	B	C	D	E	F
/	Examination of product	1,5	1,10	1,3	1,7	1,3	1
8.4.3	Power-frequency withstanding voltage test	3			4		
8.4.3	Impulse Withstanding Voltage test	2			3		
8.4.4	Contact resistance		2,4		5		
8.5.2.3	Rated power Dissipation--exclusive short-circuit protection			2			
8.5.3	Durability				2		
8.4.5	Temperature rise of clamping units					2	
8.3.2	Attachment of the fuse terminal block on its support	4					
8.3.3.1	Mechanical strength of clamping units		6				
8.3.3.2	Secureness test- flexion test		7				
8.3.3.3	Pull out test		8				
8.3.3.4	Rated cross-section and rated connecting capacity		9				
8.3.4	Compatibility between fuse terminal blocks and the fuse-link		3		6		
8.3.5.3	Mechanical strength of the connection between the terminal block base and the fuse-carrier--Actuating forces on plug-on type or hinged-type fuse-carriers		5				
8.5.4	Needle flame test						2
Sample size		5	5	6	3	5	3

4.0 Quality Assurance Provisions

4.1 Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

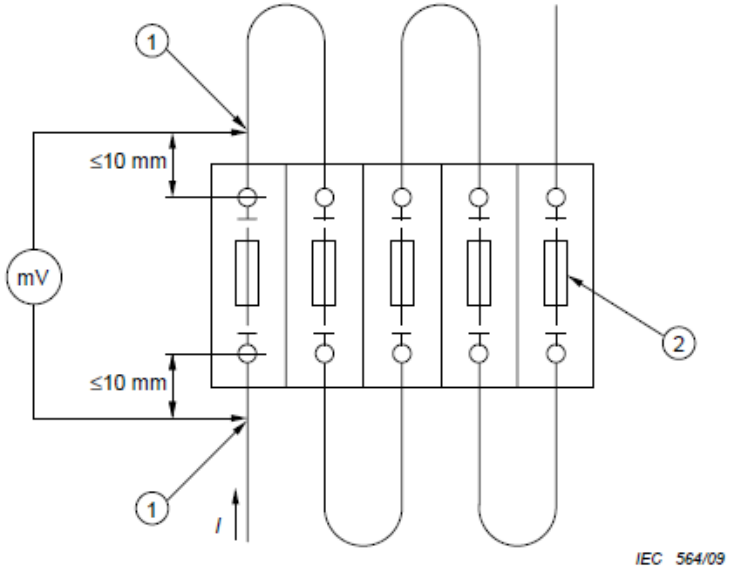
4.3. Acceptance

Acceptance is based on verification that the product meets the requirements. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmitted.

4.4. Quality Conformance Inspection

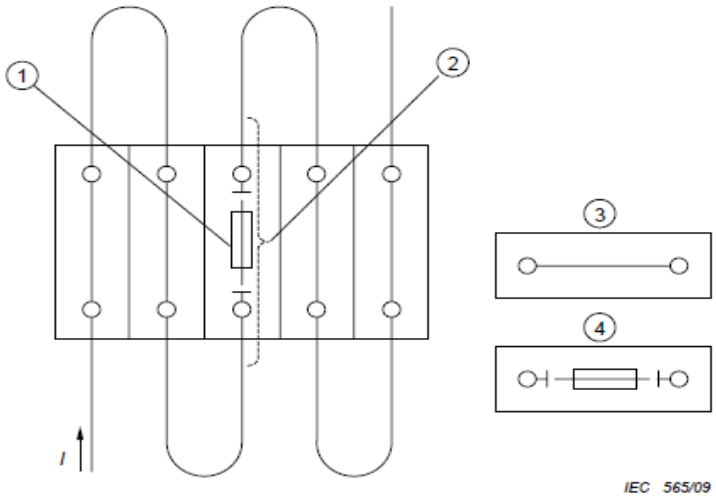
The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification

5. Figures and tables for product test



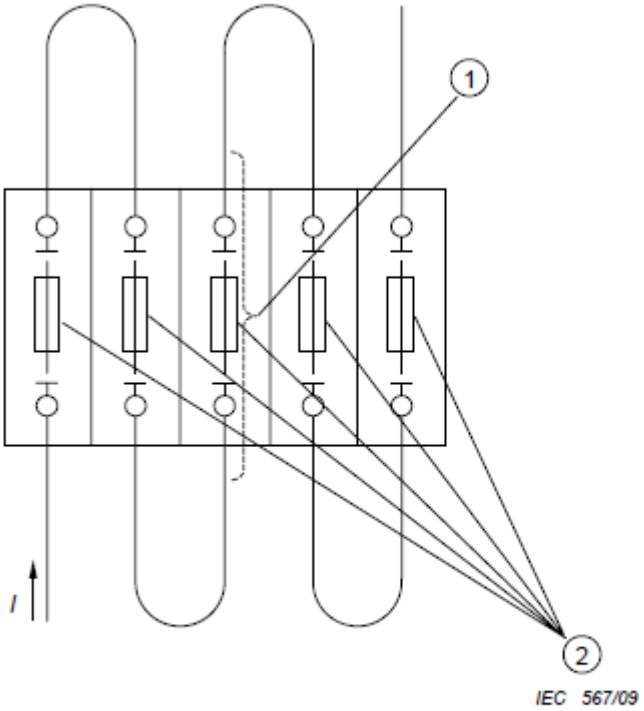
Key
1 Measuring point of voltage drop
2 Gauge no. 2 or no. 5

Figure 1 –Test arrangement for the verification of the contact resistance (comply with IEC60947-7-3)



Key
1 Dummy fuse-link
2 Temperature measurement
3 Feed-trough terminal block
4 Fuse teminal block

Figure 2 –Test arrangement for separate arrangement (Comply with IEC60947-7-3)

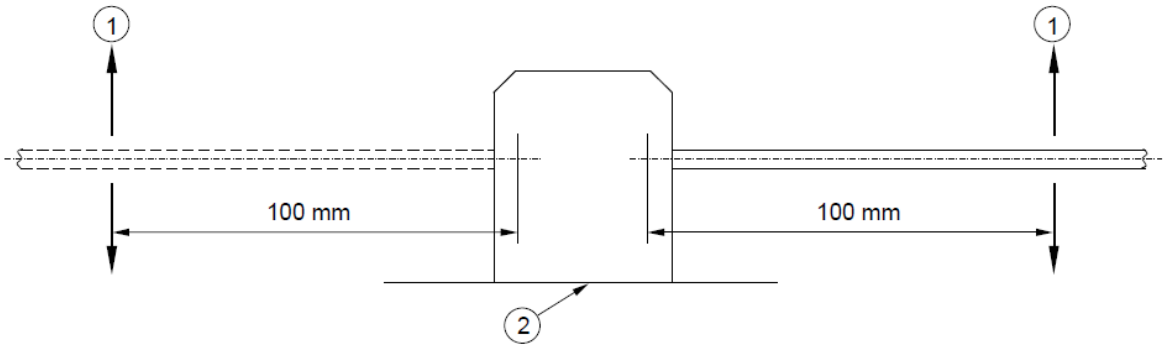


Key

1 Temperature measurement

2 Dummy fuse-link of power dissipation value P_{V2}

Figure 4 –Test arrangement for compound arrangement of short-circuit protection



Key

1 Force

2 Rail or support

Figure 5-- Arrangement for test of Attachment of the terminal block on its support(IEC60947-7-1)

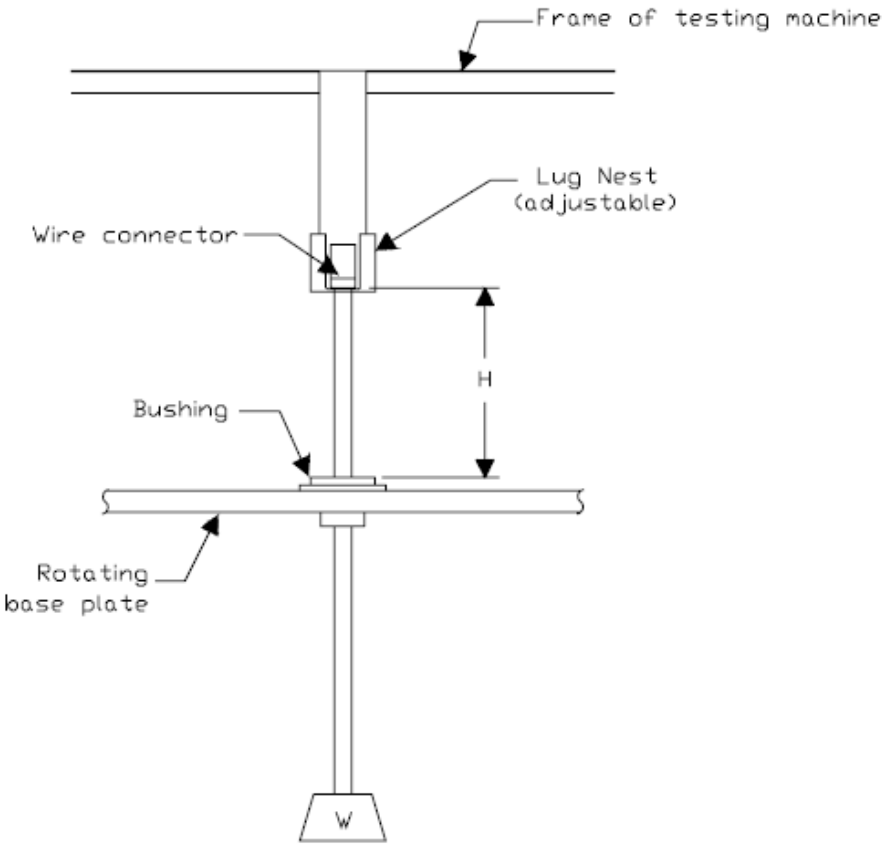
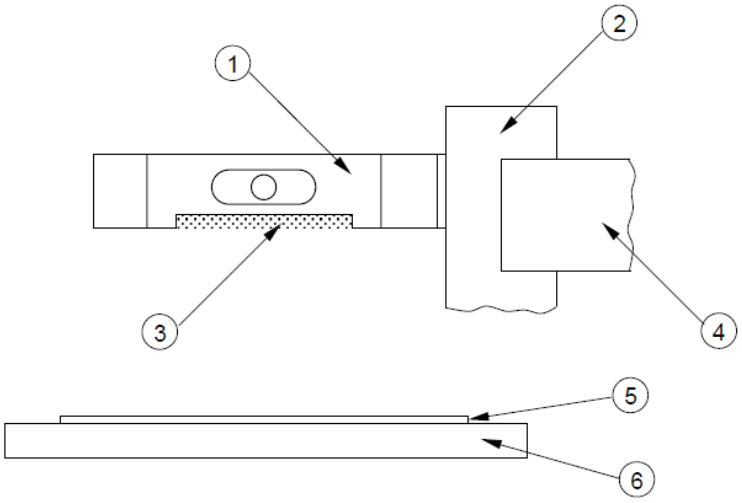


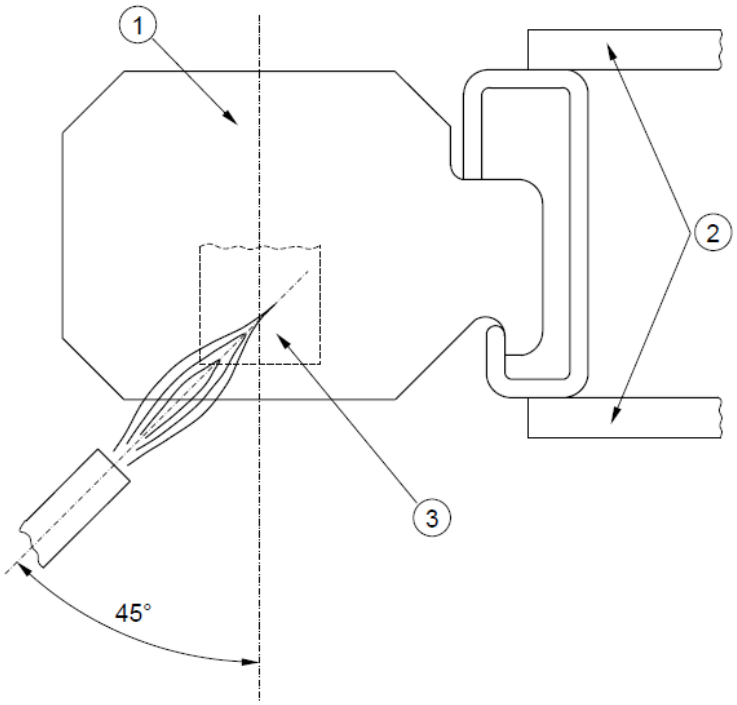
Figure 6-- Equipment for Secureness test



Key

1 Terminal block
2 Support of the terminal block
3 Lateral insulation wall
4 Fixing means
5 Tissue paper
6 Pinwood board

Figure 7 –Arrangement for Needle test(comply with IEC60947-7-1)



Key

1 Terminal block
2 Fixing means
3 Clamping part in the area of the damping unit

Figure 8 –Point of test flame contact
(view from the layer placed below the terminal block)

Rated cross-section of the terminal block		Force	Diameter of pin
mm^2	AWG/kcmil	N	mm
0,2	24		
0,34	22		
0,5	20		
0,75	18		
1,0	–	1	1,0
1,5	16		
2,5	14		
4	12		
6	10		
10	8	5	2,8
16	6		
25	4		
35	2	10	5,7
50	0		
70	00		

Table 1 Parameters for test of attachment of the terminal block on its support

Conductor cross-section		Diameter of bushing hole [a, b]	Height H [a]	Mass	Pulling force
mm^2	AWG/kcmil	mm	mm	kg	N
0,2	24	6,5	260	0,2	10
0,34	22	6,5	260	0,2	15
0,5	20	6,5	260	0,3	20
0,75	18	6,5	260	0,4	30
1,0	–	6,5	260	0,4	35
1,5	16	6,5	260	0,4	40
2,5	14	9,5	280	0,7	50
4,0	12	9,5	280	0,9	60
6,0	10	9,5	280	1,4	80
10	8	9,5	280	2,0	90
16	6	13,0	300	2,9	100
25	4	13,0	300	4,5	135
–	3	14,5	320	5,9	156
35	2	14,5	320	6,8	190

Table 3 Parameters for secureness test and pullout force test (comply with IEC60947-7-3)

Diameter of thread mm				Tightening torque N·m		
Metric standard values	Range of diameter			I	II	III
1,6	≤1,6			0,05	0,1	0,1
2,0	>1,6	up to and including	2,0	0,1	0,2	0,2
2,5	>2,0	up to and including	2,8	0,2	0,4	0,4
3,0	>2,8	up to and including	3,0	0,25	0,5	0,5
–	>3,0	up to and including	3,2	0,3	0,6	0,6
3,5	>3,2	up to and including	3,6	0,4	0,8	0,8
4,0	>3,6	up to and including	4,1	0,7	1,2	1,2
4,5	>4,1	up to and including	4,7	0,8	1,8	1,8
5	>4,7	up to and including	5,3	0,8	2,0	2,0
6	>5,3	up to and including	6,0	1,2	2,5	3,0
8	>6,0	up to and including	8,0	2,5	3,5	6,0
10	>8,0	up to and including	10,0	–	4,0	10,0
12	>10	up to and including	12	–	–	14,0
14	>12	up to and including	15	–	–	19,0
16	>15	up to and including	20	–	–	25,0
20	>20	up to and including	24	–	–	36,0
24	>24			–	–	50,0

Column I Applies to screws without heads which, when tightened, do not protrude from the hole, and to other screws which cannot be tightened by means of a screwdriver with a blade wider than the root diameter of the screw.

Column II Applies to nuts and screws which are tightened by means of a screwdriver.

Column III Applies to nuts and screws which can be tightened by means other than a screwdriver.

Table 4 of IEC60947-1 Parameters for Tightening torques for the verification of the mechanical strength of screw-type terminals

Rated impulse withstand voltage U_{imp} kV	Test voltages and corresponding altitudes $U_{1,2/50}$ kV				
	Sea level	200 m	500 m	1 000 m	2 000 m
0,33	0,35	0,35	0,35	0,34	0,33
0,5	0,55	0,54	0,53	0,52	0,5
0,8	0,91	0,9	0,9	0,85	0,8
1,5	1,75	1,7	1,7	1,6	1,5
2,5	2,95	2,8	2,8	2,7	2,5
4,0	4,8	4,8	4,7	4,4	4,0
6,0	7,3	7,2	7,0	6,7	6,0
8,0	9,8	9,6	9,3	9,0	8,0
12	14,8	14,5	14	13,3	12
NOTE Table 12 uses the characteristics of a homogeneous field, case B (see 2.5.62).					

Table 12 of IEC60947-1 Impulse withstand test voltages

Rated insulation voltage U_i V	AC test voltage (r.m.s.) V	DC test voltage [b, c] V
$U_i \leq 60$	1 000	1 415
$60 < U_i \leq 300$	1 500	2 120
$300 < U_i \leq 690$	1 890	2 670
$690 < U_i \leq 800$	2 000	2 830
$800 < U_i \leq 1\,000$	2 200	3 110
$1\,000 < U_i \leq 1\,500$ [a]	–	3 820

[a] For d.c. only.

[b] Test voltages based on ~~4.1.2.3.1~~ 6.1.3.4.1, ~~third~~ fifth paragraph of IEC 60664-1:2007.

[c] A direct current test voltage may be used only if an alternating test voltage cannot be applied. See also 3) b) ii) of 8.3.3.4.1.

Table 12A of IEC60947-1 Dielectric test voltage corresponding to the rated insulation voltage

Gauges

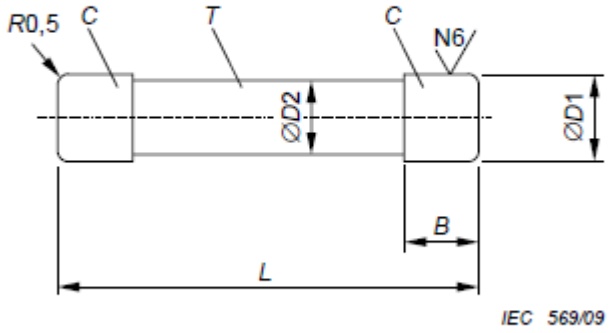


Figure A.1 – Outline of the gauges

Type of cartridge fuse-link mm	Gauge No.	Size	*L* mm	*D1* mm	*D2* mm	*B* mm	Mass approx. g	Material of part	
								C	T
	1	Max.	$20{,}54\ ^{0}_{-0{,}04}$	$5{,}3\ ^{+0{,}01}_{0}$	4,2 ± 0,1	$5\ ^{+0{,}1}_{0}$	–	Steel [a]	
5 × 20									
	2	Min.	$19{,}46\ ^{+0{,}04}_{0}$	$5{,}0\ ^{0}_{-0{,}01}$	4,2 ± 0,1	$5\ ^{+0{,}1}_{0}$	2,5	Brass [b]	
	3	–	$20{,}54\ ^{0}_{-0{,}04}$	$5{,}3\ ^{+0{,}01}_{0}$	4,2	$6{,}2\ ^{+0{,}1}_{0}$	–	Brass end caps [b]	Glass or ceramic tube
6,3 × 32	4	Max.	$32{,}64\ ^{0}_{-0{,}04}$	$6{,}45\ ^{+0{,}01}_{0}$	5,5 ± 0,1	$6\ ^{+0{,}1}_{0}$	–	Steel [a]	
	5	Min.	$30{,}96\ ^{+0{,}04}_{0}$	$6{,}25\ ^{0}_{-0{,}01}$	5,5 ± 0,1	$6\ ^{+0{,}1}_{0}$	6	Brass [b]	
	6	–	$32{,}64\ ^{0}_{-0{,}04}$	$6{,}45\ ^{+0{,}01}_{0}$	5,5	$8{,}3\ ^{+0{,}1}_{0}$	–	Brass end caps [b]	Glass or ceramic tube

NOTE All test gauges are without a melting element.

[a] Hardened.

[b] Copper content from 58 % to 70 %.

Remark: This table is taken from IEC 60127-6

The gauges or their parts made from brass shall be coated with a nickel layer of 8 µ m and a gold layer of 4,5 µ m. The end of the gauges shall have no holes.

The gauges shall have a homogenous composition, except for gauges no. 3 and no. 6.

Table A.1 – Dimensions and materials for gauges for fuse-links according to IEC 60127-2

TE型号	Part Number	IEC			Rated Impulse Voltage (KV)	Terminal screw		Wire Strip Length	Actual force on fuse carrier
		Rated Voltage (V)	Rated Current (A)	Wire Range (mm^2)		Screw Size	Torque Spec. (in-lbs/Nm)		
DTC 4-FU	2271701-*	800	6.3	0.33-4	6	M3	7.7 / 0.88	10-12	25N max.
DTC 4-FULED 24	2271702-*	800	6.3	0.33-4	6	M3	7.7 / 0.88	10-12	
DTC 4-FULED 60	2271703-*	800	6.3	0.33-4	6	M3	7.7 / 0.88	10-12	
DTS 4-FULED 240	2271704-*	800	6.3	0.33-4	6	M3	7.7 / 0.88	10-12	

Table10 Parameters for fuse terminal block