



Test Report issued under the responsibility of:



TEST REPORT
IEC/EN 60947-2
Low-voltage switchgear and controlgear - Part 2: Circuit-breakers

Report Reference No.: C009-CE2010CQC0303-004103

Date of issue: 2011-09-30

Total number of pages: 125

CB/CCA Testing Laboratory: Shanghai Testing & Inspection Institute for Electrical Equipment (STIEE)

Address: 505 Wu Ning Rd. Shanghai 200063, P.R. CHINA

Applicant's name: Zhejiang Tengen Electrics Co., Ltd.

Address: TENGEN Industry Zone, Liushi, Yueqing, Zhejiang, P.R.China

Test specification:

Standard: ☐ IEC 60947-2:2006 (4th Edition) and/or
☒ EN 60947-2:2006 (4th Edition)

Test procedure: CCA

Non-standard test method: N/A

Test Report Form No.: IECEN60947_2B

Test Report Form(s) Originator: KEMA

Master TRF: Dated 2008-10

Copyright © 2007 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

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.

If this Test Report Form is used by non-CCA members, the CIG logo and the reference to the CCA Procedure shall be removed.

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

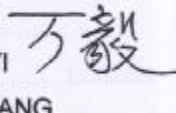
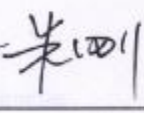
Test item description: Moulded Case Circuit-Breaker

Trade Mark: TENGEN

Manufacturer: Zhejiang Tengen Electrics Co., Ltd.
TENGEN Industry Zone, Liushi, Yueqing, Zhejiang, P.R.China

Model/Type reference: TGM1-100

Ratings: Ue: AC400V, AC690V
In: 16A, 20A, 25A, 32A, 40A, 50A, 63A, 80A, 100A

| Testing procedure and testing location: | |
|---|--|
| <input checked="" type="checkbox"/> CB/CCA Testing Laboratory: | Shanghai Testing & Inspection Institute for Electrical Equipment (STIEE) |
| Testing location/ address.....: | 505 Wu Ning Rd. Shanghai 200063, P.R. CHINA |
| <input type="checkbox"/> Associated CB Laboratory: | N/A |
| Testing location/ address.....: | N/A |
| Tested by (name + signature).....: | WAN YI  |
| Approved by (+ signature) | ZHU GANG  |
| <input type="checkbox"/> Testing procedure: TMP | N/A |
| Tested by (name + signature).....: | N/A |
| Approved by (+ signature) | N/A |
| Testing location/ address.....: | N/A |
| <input type="checkbox"/> Testing procedure: WMT | N/A |
| Tested by (name + signature).....: | N/A |
| Witnessed by (+ signature).....: | N/A |
| Approved by (+ signature) | N/A |
| Testing location/ address.....: | N/A |
| <input type="checkbox"/> Testing procedure: SMT | N/A |
| Tested by (name + signature).....: | N/A |
| Approved by (+ signature) | N/A |
| Supervised by (+ signature).....: | N/A |
| Testing location/ address.....: | N/A |
| <input type="checkbox"/> Testing procedure: RMT | N/A |
| Tested by (name + signature).....: | N/A |
| Approved by (+ signature) | N/A |
| Supervised by (+ signature).....: | N/A |
| Testing location/ address.....: | N/A |

| Particulars: test item vs. test requirements | |
|---|--|
| 3. Classification | |
| 3.1. Utilization category: (A or B)..... | A |
| 3.2. Interruption medium: (air, vacuum, gas Break)..... | Air |
| 3.3. Design: (open construction, moulded case)..... | Moulded case |
| 3.4. Method of controlling the operation mechanism: (dependent manual, independent manual, dependent power, independent power) | Independent manual, dependent power |
| 3.5. Suitability for insulation: (suitable, not -suitable)..... | Suitable |
| 3.6. Provision for maintenance: (maintainable, non maintainable)..... | Nonmaintainable |
| 3.7. Method of installation: (fixed, plug in, withdrawable)..... | Fixed, plug in |
| 3.8. Degree of protection: (IP code) | N/A |
| 4.8. Integral fuses (integrally fused circuit-breakers) Type and characteristics of SCPD..... | N/A |
| 4.9. Switching overvoltages: (when Uimp. is declared). | N/A |
| 7.3 Electromagnetic compatibility (EMC) | |
| Environment A or B..... | A |
| Circuit-breaker for use on phase-earthed systems | N/A |
| Circuit-breaker for use in IT systems..... | N/A |
| Rated and limiting values, main circuit | |
| - rated operational voltage: Ue (V)..... | AC400V, AC690V |
| - rated insulation voltage: Ui (V)..... | 800V |
| - rated impulse withstand voltage: Uimp (kV)..... | 8kV |
| - rated operational current: Ie (A)..... | 16A, 20A, 25A, 32A, 40A, 50A, 63A, 80A, 100A |
| - kind of current | AC |
| - conventional free air thermal current: Ith (A)..... | 16A, 20A, 25A, 32A, 40A, 50A, 63A, 80A, 100A |
| - conventional enclosed thermal current: Ithe (A) | N/A |
| - current rating for four-pole circuit-breakers: (A)..... | 16A, 20A, 25A, 32A, 40A, 50A, 63A, 80A, 100A |
| - number of poles | 3P(Type L, Type M), 4P(Type M) |
| - rated frequency: (Hz) | 50Hz |
| - integral fuses (rated values) | N/A |
| Rated duty : | |
| - eight-hour duty | N/A |
| - uninterrupted duty: Iu (A) | 16A, 20A, 25A, 32A, 40A, 50A, 63A, 80A, 100A |
| Short-circuit characteristic : | |
| rated short-time making capacity: Icm (kA)..... | Type L: 73,5kA/AC400V, 7,65kA/AC690V |

| | |
|---|---|
| | Type M: 105kA/AC400V, 17kA/AC690V |
| rated ultimate short-circuit breaking capacity: I_{cu} (kA) | Type L: 35kA/AC400V, 5kA/AC690V Type M: 50kA/AC400V, 10kA/AC690V |
| rated service short-circuit breaking capacity: I_{cs} (kA) | Type L: 22kA/AC400V, 4kA/AC690V Type M: 35kA/AC400V, 5kA/AC690V |
| rated short-time withstand current: I_{cw} (kA/s) | N/A |
| Control circuits : | |
| Electrical control circuits : | |
| - kind of current: (AC, DC) | AC |
| - rated frequency: (Hz) | 50Hz |
| - rated control circuit voltage: U_c (nature, frequency, V) | AC 50Hz 220/230V, 380/400V |
| - rated control supply voltage: U_s (nature, frequency V) | AC 50Hz 220/230V, 380/400V |
| Air supply control circuits: (pneumatic or electro-pneumatic) : | |
| - rated pressure and its limit | N/A |
| - volumes of air, at atmospheric pressure, required for each closing and each opening operation | N/A |
| Auxiliary circuits : | |
| Rated and limiting values, auxiliary circuits | |
| - rated operational voltage U_e (V) | AC380V; DC220V |
| - rated insulation voltage: U_i (V) | 690V |
| - rated operational current: I_e (A) | 0,3A(AC380V); 0,15A(DC220V) |
| - kind of current | AC, DC |
| - rated frequency: (Hz) | 50Hz |
| - number of circuits | N/A |
| - number and kind of contact elements | 1NO+1NC, 2NO+2NC, 4NO+4NC |
| - rated uninterrupted current: I_u (A) | 3A |
| - utilization category: (AC, DC, current and voltage) | AC-15, DC-13 |
| Short-circuit characteristic : | |
| - Rated conditional short-circuit current (kA) | 1kA |
| - Co-ordination of short-circuit protective devices | RL6-25/6 |
| - kind of protective device | Fuse |

Releases :

- 1) shunt release : Yes
- 2) Over-current release : Yes
- a) instantaneous : Yes
- b) definite time delay : N/A
- c) inverse time delay : Yes
- independent of previous load : N/A
- dependent on previous load; (for example thermal type release) : Yes
- 3) Undervoltage release (for opening) : Yes
- 4) Other releases : N/A

Characteristics :

1) Shunt release and undervoltage release (for opening).....:

- rated control circuit voltage: U_c (nature, frequency, V) : Shunt release :
AC 50Hz 220V, 380V;
DC 24V, 110V
Undervoltage release:
AC 50Hz 220V, 380V

- kind of current : Shunt release : AC, DC
Undervoltage release: AC

- rated frequency: (if AC) : 50Hz

2) Over-current release.....:

- rated current : 16A, 20A, 25A, 32A, 40A, 50A, 63A, 80A, 100A

- kind of current : AC

- rated frequency: (if AC) : 50Hz

- current setting (or range of settings) : Instantaneous: 10In(Power Distribution Protection); 12In(Motor Protection)
Inverse time delay: In

- time settings (or range of settings) : N/A