



Test Report issued under the responsibility of:



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

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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: [X] IEC 60947-2:2006 (4th Edition) and/or [ ] EN 60947-2:2006 (4th Edition)
Test procedure: CB
Non-standard test method: N/A

Test Report Form No.: IECEN60947\_2B
Test Report Form(s) Originator: KEMA
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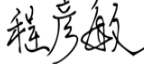

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Test item description: Moulded Case Circuit-Breaker
Trade Mark: TENGEN
Manufacturer: Zhejiang Tengen Electrics Co., Ltd.
Model/Type reference: TGM1-630
Ratings: Ue: AC415V, AC690V; In: 400A,500A,630A

<b>Testing procedure and testing location:</b>	
<input checked="" type="checkbox"/> <b>CB/CCA Testing Laboratory:</b>	Shanghai Testing & Inspection Institute for Electrical Equipment (STIEE)
Testing location/ address .....	505 Wu Ning Rd. Shanghai 200063, P.R. CHINA
<input type="checkbox"/> <b>Associated CB Laboratory:</b>	N/A
Testing location/ address .....	N/A
Tested by (name + signature) .....	Cheng Yanmin 
Approved by (+ signature) .....	Wei Qingyuan 
<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	
<b>3. Classification</b>	
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) .....	: Non maintainable
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
<b>7.3 Electromagnetic compatibility (EMC)</b>	
Environment A or B .....	: A
Circuit-breaker for use on phase-earthed systems .....	: N/A
Circuit-breaker for use in IT systems .....	: N/A
<b>Rated and limiting values, main circuit</b> .....	
- rated operational voltage: Ue (V) .....	: AC415V, AC690V
- rated insulation voltage: Ui (V) .....	: 800V
- rated impulse withstand voltage: Uimp (kV) .....	: 8kV
- rated operational current: Ie (A) .....	: 400A,500A,630A
- kind of current.....	: AC
- conventional free air thermal current: Ith (A) .....	: 400A,500A,630A
- conventional enclosed thermal current: Ithe (A) .....	: N/A
- current rating for four-pole circuit-breakers: (A) .....	: 400A,500A,630A
- number of poles .....	: 3P(Type L, Type M), 4P(Type M)
- rated frequency: (Hz).....	: 50/60Hz
- integral fuses (rated values).....	: N/A
<b>Rated duty :</b>	
- eight-hour duty.....	: N/A
- uninterrupted duty: Iu (A).....	: 400A,500A,630A
<b>Short-circuit characteristic :</b>	
rated short-time making capacity: Icm (kA) .....	: Type L: 105kA/AC415V, 17kA/AC690V Type M: 143kA/AC415V, 17kA/AC690V

rated ultimate short-circuit breaking capacity: $I_{cu}$ (kA) .. .. . :	Type L: 50kA/AC415V, 10kA/AC690V Type M: 65kA/AC415V, 10kA/AC690V
rated service short-circuit breaking capacity: $I_{cs}$ (kA) .. . . . . . :	Type L: 35kA/AC415V, 5kA/AC690V Type M: 42kA/AC415V, 5kA/AC690V
rated short-time withstand current: $I_{cw}$ (kA/s) .. . . . . . :	N/A
<b>Control circuits :</b>	
<b>Electrical control circuits :</b>	
- kind of current: (AC, DC)..... :	AC
- rated frequency: (Hz)..... :	50/60Hz
- rated control circuit voltage: $U_c$ ( nature, frequency, V) ... :	AC 50/60Hz 240V, 415V
- rated control supply voltage: $U_s$ (nature, frequency V) ... :	AC 50/60Hz 240V, 415V
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
<b>Auxiliary circuits :</b>	
Rated and limiting values, auxiliary circuits..... :	
- rated operational voltage $U_e$ (V) .....	AC415V; DC220V
- rated insulation voltage: $U_i$ (V) .....	690V
- rated operational current: $I_e$ (A) .....	3A(AC415V); 0,20A(DC220V)
- kind of current..... :	AC, DC
- rated frequency: (Hz)..... :	50/60Hz
- number of circuits .....	N/A
- number and kind of contact elements .....	2NO+2NC
- 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 50/60Hz 240V, 415V;  
DC 24V, 110V  
Undervoltage release:  
AC 50/60Hz 240V, 415V
- kind of current..... : Shunt release :AC, DC  
Undervoltage release: AC
- rated frequency: (if AC) ..... : 50/60Hz
- 2) Over-current release ..... :
- rated current ..... : 400A,500A,630A
- kind of current..... : AC
- rated frequency: (if AC) ..... : 50/60Hz
- current setting (or range of settings)..... : Instantaneous:  $10I_n$ (Power Distribution Protection);  $12I_n$ (Motor Protection)  
Inverse time delay:  $I_n$
- time settings (or range of settings) ..... : N/A