



BST Testing (Shenzhen)Co., Ltd.

Report No.: XDAD237242612072326AR

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Shanghai Matis Electric Co.,Ltd.

CE TEST REPORT

Prepared For :	Shanghai Matis Electric Co.,Ltd. Room 320,No.83, Huanhu West Third Road, Pudong, Shanghai, China
Product Name:	Smart Metering MCCB
Trade Mark::	/
Main Test Model:	MTS3-EL630S
Additional Model:	RP-SCB-II/1P、RP-SCB-II/2P、RP-SCB-II/3P
Prepared By :	BST Testing (Shenzhen)Co., Ltd. No.7, New Era Industrial Zone, Guantian, Bao'an District, Shenzhen, Guangdong, China
Test Date:	Jul. 13, 2024 - Jul. 23, 2024
Date of Report:	Jul. 23, 2024
Report No.:	XDAD237242612072326AR

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LVD Report
EN 60947-2
Low-voltage switchgear and controlgear - Part 2: Circuit-breakers

Testing laboratory : BST Testing (Shenzhen)Co., Ltd.

Address : No.7, New Era Industrial Zone, Guantian, Bao'an District, Shenzhen, Guangdong, China

Testing location : BST Testing (Shenzhen)Co., Ltd.

Applicant : Shanghai Matis Electric Co.,Ltd.

Address : Room 320,No.83, Huanhu West Third Road, Pudong, Shanghai, China

Standard : EN 60947-2:2017/A1:2020
EN 60947-1:2007/A2:2014

Procedure deviation : N.A.

Non-standard test method : N.A.

Type of test object : Smart Metering MCCB

Trademark : N.A.

Model/type reference : See page 1

Rating : Input voltage: AC415V
Output voltage: AC415V
Input current: 630A
Output current: 125A, 250A, 400A, 630A
Operating frequency: 50Hz

Manufacturer : Shanghai Matis Electric Co.,Ltd.

Address : Room 320,No.83, Huanhu West Third Road, Pudong, Shanghai, China

Factory : Shanghai Matis Electric Co.,Ltd.

Address : Room 320,No.83, Huanhu West Third Road, Pudong, Shanghai, China

Particulars: test item vs. test requirements

Operating condition..... Continuous operation



Possible test case verdicts :

- test case does not apply to the test object : N(.A.)
- test object does meet the requirement : P(ass)
- test object does not meet the requirement : F(ail)

General remarks:	
<p>"(see remark #)" refers to a remark appended to the report.</p> <p>"(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p>	<p>Attached with:</p> <ul style="list-style-type: none">A. photo documentation <p>General product information:</p> <p>The series products have the same circuit diagram, PCB layout and functionality. The differences are the model name, so, we select MTS3-EL630S to test.</p>



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Artwork of Marking Label

Smart Metering MCCB
Input voltage: AC415V
Output voltage: AC415V
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Operating frequency: 50Hz
Model: MTS3-EL630S



Shanghai Matis Electric Co.,Ltd.

Prepared by :

Lanya Li

Engineer

Reviewer :



Approved & Authorized Signer :

[Signature]

Manager



EN 60947-1			
Clause	Requirement – Test	Result - Remark	Verdict
4	Characteristics		P
4.2	Type of equipment		P
	The product standard shall state the following, where applicable:		P
	kind of equipment: e.g. contactor, circuit-breaker, etc.		P
	number of poles;		P
	kind of current;		N
	interrupting medium;		P
	operating conditions (method of operation, method of control, etc.).		P
4.3	Rated and limiting values for the main circuit		P
4.3.1	Rated voltages		P
4.3.1.1	Rated operational voltage (Ue)	AC415V	P
	a) equipment for use on systems where a single fault to earth will not cause the full phase-to-phase voltage to appear across a pole;		P
	neutral earthed systems;		N
	unearthed and impedance earthed systems.		N
	b) equipment for use on systems where a single fault to earth will cause the full phase-to-phase voltage to appear across a pole (i.e. phase earthed systems).		P
4.3.1.2	Rated insulation voltage (Ui)	AC 1000V	P
4.3.1.3	Rated impulse withstand voltage (Uimp)	8000V	P
4.3.2	Currents		P
4.3.2.1	Conventional free air thermal current (Ith)		N
4.3.2.2	Conventional enclosed thermal current (Ithe)		N
4.3.2.3	Rated operational current (Ie) or rated operational power		N
4.3.2.4	Rated uninterrupted current (Iu)		N
4.3.3	Rated frequency		P
4.3.4	Rated duties		P
4.3.4.1	Eight-hour duty		N
4.3.4.2	Uninterrupted duty		P
4.3.4.3	Intermittent periodic duty or intermittent duty		N
	According to the number of operating cycles which they shall be capable of carrying out per hour, equipments are divided into the following classes:		N
	class 1: 1 operating cycle per hour;		N
	class 3: 3 operating cycles per hour;		N
	class 12: 12 operating cycles per hour;		N
	class 30: 30 operating cycles per hour;		N
	class 120: 120 operating cycles per hour;		N
	class 300: 300 operating cycles per hour;		N
	class 1 200: 1 200 operating cycles per hour;		N
	class 3 000: 3 000 operating cycles per hour;		N
	class 120 000: 120 000 operating cycles per hour;		N



EN 60947-1			
Clause	Requirement – Test	Result - Remark	Verdict
	class 300 000: 300 000 operating cycles per hour.		N
4.3.4.4	Temporary duty		N
4.3.4.5	Periodic duty		N
4.3.5	Normal load and overload characteristics		N
4.3.5.1	Ability to withstand motor switching overload currents		N
4.3.5.2	Rated making capacity		P
	The making conditions which shall be specified are:		P
	the applied voltage (see 2.5.32);		P
	the characteristics of the test circuit.		P
4.3.5.3	Rated breaking capacity		P
	The breaking conditions which shall be specified are:		P
	the characteristics of the test circuit;		P
	the power-frequency recovery voltage.		P
4.3.6	Short-circuit characteristics		N
4.3.6.1	Rated short-time withstand current (I _{cw})		N
4.3.6.2	Rated short-circuit making capacity (I _{cm})	16.25KA	P
4.3.6.3	Rated short-circuit breaking capacity (I _{cn})	65KA	P
4.3.6.4	Rated conditional short-circuit current		N
4.4	Utilization category		P
	The utilization category of an equipment defines the intended application and shall be specified in the relevant product standard; it is characterized by one or more of the following service conditions:		P
	current(s), expressed as multiple(s) of the rated operational current;		N
	voltage(s), expressed as multiple(s) of the rated operational voltage;		P
	power-factor or time-constant;		N
	short-circuit performance;		N
	selectivity;		N
	other service conditions, as applicable.		N
4.5	Control circuits		P
4.5.1	Electrical control circuits		P
	The characteristics of electrical control circuits are:		P
	kind of current;		N
	rated frequency if a.c.;		N
	rated control circuit voltage U _c (nature, and frequency if a.c.);		P
	rated control supply voltage U _s (nature, and frequency if a.c.), where applicable.		N
4.5.2	Air-supply control circuits (pneumatic or electro-pneumatic)		N
	The characteristics of air-supply control circuits are:		N



EN 60947-1			
Clause	Requirement – Test	Result - Remark	Verdict
	rated pressure and its limits;		N
	volumes of air, at atmospheric pressure, required for each closing and each opening operation.		N
4.6	Auxiliary circuits		P
4.7	Relays and releases		P
4.8	Co-ordination with short-circuit protective devices (SCPD)		N
4.9	Switching overvoltages		P
5	Product information		P
5.1	Nature of information		P
	The following information shall be given by the manufacturer, when required by the relevant product standard:		P
	manufacturer's name or trademark;	Shanghai Matis Electric Co.,Ltd.	P
	type designation or serial number;	See page 2	P
	number of the relevant product standard, if the manufacturer claims compliance.		P
	Characteristics:		P
	rated operational voltages (see 4.3.1.1 and note to 5.2);	AC415V	P
	utilization category and rated operational currents (or rated powers or rated uninterrupted currents), at the rated operational voltages of the equipment (see 4.3.1.1, 4.3.2.3, 4.3.2.4 and 4.4). In certain cases, this information may have to be completed by the value of the reference ambient air temperature at which the equipment has been calibrated;		P
	the value of the rated frequency/frequencies, e.g.: 50 Hz, 50 Hz/60 Hz, and/or the indication "d.c." or the symbol ;		N
	rated duty, with the indication of the class of intermittent duty, if any (see 4.3.4);		N
	rated making and/or breaking capacities. These indications may be replaced, where applicable, by the indication of the utilization category;		P
	rated insulation voltage (see 4.3.1.2);		P
	rated impulse withstand voltage (see 4.3.1.3);		P
	switching overvoltage (see 4.9);		P
	rated short-time withstand current together with its duration, where applicable (see 4.3.6.1);		N
	rated short-circuit making and/or breaking capacities, where applicable (see 4.3.6.2 and 4.3.6.3);		N
	rated conditional short-circuit current, where applicable (see 4.3.6.4);		N



EN 60947-1			
Clause	Requirement – Test	Result - Remark	Verdict
	IP code, in case of enclosed equipment (see Annex C);		N
	pollution degree (see 6.1.3.2);		P
	type and maximum ratings of short-circuit protective device, where applicable;		P
	class of protection against electric shock (see IEC 61140), where applicable;		N
	rated control circuit voltage, kind of current and frequency;		P
	rated control supply voltage, kind of current and frequency, if different from those of the control coil;		N
	rated supply pressure of the air-pressure and limits of pressure variations (for air-pressure controlled equipment);		N
	suitability for isolation.		N
5.2	Marking		P
	a) on equipment for use on three-phase – four-wire systems, by both the value of phase-to-earth voltage and that of phase-to-phase voltage, e.g. 277/480 V;		P
	b) on equipment for use on three-phase – three-wire systems, by the value of phase-to-phase voltage, e.g. 480 V.		P
	The following information shall also be marked and visible after mounting:		P
	direction of movement of the actuator (see 7.1.5.2), if applicable;		P
	indication of the position of the actuator (see also 7.1.6.1 and 7.1.6.2);		P
	approval or certification mark, if applicable;		P
	for miniaturized equipment, symbol, colour code or letter code;		P
	terminal identification and marking (see 7.1.8.4);		P
	IP code and class of protection against electric shock, when applicable (marked preferably on the equipment as far as possible);		N
	suitability for isolation, where applicable, with the isolation function symbol according to IEC 60617-7, reference 07-01-03, combined with the appropriate function symbol for the equipment, e.g.:		N
5.3	Instructions for installation, operation and maintenance		P
6	Normal service, mounting and transport conditions		P
6.1	Normal service conditions		P
6.1.1	Ambient air temperature		P
6.1.2	Altitude	<35°C	P
6.1.3	Atmospheric conditions	<2000m	P



EN 60947-1			
Clause	Requirement – Test	Result - Remark	Verdict
6.1.3.1	Humidity		N
6.1.3.2	Pollution degree	No pollution or only dry, non-conductive pollution occurs.	P
6.1.4	Shock and vibration		P
6.2	Conditions during transport and storage		P
6.3	Mounting	the manufacturer's instructions.	P
7	Constructional and performance requirements		P
7.1	Constructional requirements		P
7.1.2	Materials	resistance to abnormal heat and fire.	P
7.1.2.1	General materials requirements		P
7.1.2.2	Glow wire testing	PCB	P
7.1.2.3	Test based on flammability category		P
7.1.3	Current-carrying parts and their connections		P
7.1.4	Clearances and creepage distances		P
7.1.5	Actuator		N
7.1.5.1	Insulation		N
	Moreover:		N
	if it is made of metal, it shall be capable of being satisfactorily connected to a protective conductor unless it is provided with additional reliable insulation;		N
	if it is made of or covered by insulating material, any internal metal part, which might become accessible in the event of insulation failure, shall also be insulated from live parts for the rated insulation voltage.		N
7.1.5.2	Direction of movement		N
7.1.6	Indication of the contact position		N
7.1.6.1	Indicating means		N
7.1.6.2	Indication by the actuator		N
7.1.7	Additional requirements for equipment suitable for isolation		P
7.1.7.1	Additional constructional requirements		P
	the position of the actuator;		N
	a separate mechanical indicator;		N
	visibility of the moving contacts.		N
7.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers		N
7.1.7.3	Supplementary requirements for equipment provided with means for padlocking the open position		N
7.1.8	Terminals		P
7.1.8.1	Constructional requirements		P
7.1.8.2	Connecting capacity		P
7.1.8.3	Connection		P
7.1.8.4	Terminal identification and marking		P
7.1.9	Additional requirements for equipment provided with a neutral pole		N



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Clause	Requirement – Test	Result - Remark	Verdict
7.1.10	Provisions for protective earthing		N
7.1.10.1	Constructional requirements		N
7.1.10.2	Protective earth terminal		N
7.1.10.3	Protective earth terminal marking and identification		N
7.1.11	Enclosures for equipment		N
7.1.11.1	Design		N
7.1.11.2	Insulation		N
7.1.13	Conduit pull-out, torque and bending with metallic conduits		P
7.2	Performance requirements		P
7.2.1	Operating conditions		P
7.2.1.1	General		P
7.2.1.2	Limits of operation of power operated equipment		N
7.2.1.3	Limits of operation of under-voltage relays and releases		P
	a) Operating voltage		P
	b) Operating time	0~3s	P
7.2.1.4	Limits of operation of shunt releases		N
7.2.1.5	Limits of operation of current operated relays and releases		N
7.2.2	Temperature-rise		P
7.2.2.1	Terminals		P
7.2.2.2	Accessible parts		P
7.2.2.3	Ambient air temperature		P
7.2.2.4	Main circuit		N
7.2.2.5	Control circuits		N
7.2.2.6	Windings of coils and electromagnets		P
7.2.2.7	Auxiliary circuits		N
7.2.2.8	Other parts		P
7.2.3	Dielectric properties		P
	The dielectric properties are based on basic safety publications IEC 60664-1 and IEC 61140.		P
	a) The following requirements provide the means of achieving co-ordination of insulation of equipment with the conditions within the installation.		P
	b) The equipment shall be capable of withstanding:		P
	the rated impulse withstand voltage (see 4.3.1.3) in accordance with the overvoltage category given in Annex H;		P
	the impulse withstand voltage across the contact gaps of devices suitable for isolation as given in Table 14;		P
	the power-frequency withstand voltage.		P
	c) The requirements of this subclause shall be verified by the tests of 8.3.3.4.		P



EN 60947-1			
Clause	Requirement – Test	Result - Remark	Verdict
7.2.3.1	Impulse withstand voltage		P
7.2.3.2	Power-frequency withstand voltage of the main, auxiliary and control circuits		P
7.2.3.3	Clearances		P
7.2.3.4	Creepage distances		P
	a) Dimensioning	Material Group I 600 < CTI	P
	b) Use of ribs		P
	c) Special applications		P
7.2.3.5	Solid insulation		P
7.2.3.6	Spacing between separate circuits		P
7.2.3.7	Requirements for equipment with protective separation		P
7.2.4	Ability to make, carry and break currents under no-load, normal load and overload conditions		N
7.2.4.1	Making and breaking capacities		P
7.2.4.2	Operational performance		P
7.2.4.3	Durability		P
7.2.4.3.1	Mechanical durability		P
7.2.4.3.2	Electrical durability		P
7.2.5	Ability to make, carry and break short-circuit currents		P
7.2.6	Switching overvoltages		P
7.2.7	Leakage currents of equipment suitable for isolation		P
7.3	Electromagnetic compatibility (EMC)		P
7.3.1	General		P
	For products falling within the scope of this standard, two sets of environmental conditions are considered and are referred to as		P
	a) environment A;		P
	b) environment B.		P
7.3.2	Immunity		P
7.3.2.1	Equipment not incorporating electronic circuits		P
7.3.2.2	Equipment incorporating electronic circuits		P
7.3.3	Emission		P
8	Tests		P
8.1	Kinds of test		P
8.1.1	General		P
	Tests are as follows:		P
8.1.2	Type tests		P
8.1.3	Routine tests		P
8.1.4	Sampling tests		P
8.2	Compliance with constructional requirements		P
	The verification of compliance with the constructional requirements stated in 7.1 concerns, for example		P



EN 60947-1			
Clause	Requirement – Test	Result - Remark	Verdict
	the materials;		P
	the equipment;		P
	the degrees of protection of enclosed equipment;		P
	the mechanical properties of terminals;		P
	the actuator;		P
	the position indicating device (see 2.3.18).		P
8.2.1	Materials		P
8.2.1.1	Test of resistance to abnormal heat and fire		P
8.2.1.1.1	Glow-wire test (on equipment)		P
8.2.1.1.2	Flammability, hot wire ignition and arc ignition tests (on materials)		P
8.2.2	Equipment		P
8.2.3	Enclosures for equipment		P
8.2.4	Mechanical properties of terminals		P
8.2.4.1	General conditions for tests	>90.5%	P
8.2.4.2	Tests of mechanical strength of terminals		P
8.2.4.3	Testing for damage to and accidental loosening of conductors (flexion test)		N
	The following tests shall be carried out using two new samples with		N
	a) the maximum number of conductors of the smallest cross-section connected to the terminal;		N
	b) the maximum number of conductors of the largest cross-section connected to the terminal;		N
	c) the maximum number of conductors of the smallest and largest cross-sections connected to the terminal.		N
8.2.4.4	Pull-out test		N
8.2.4.4.1	Round copper conductors		N
8.2.4.4.2	Flat copper conductors		N
8.2.4.5	Test for insertability of unprepared round copper conductors having the maximum specified cross-section		N
8.2.4.5.1	Test procedure		N
8.2.4.5.2	Construction of gauges		N
8.2.4.6	Tests for insertability of flat conductors with rectangular cross-section		N
8.2.5	Verification of the effectiveness of indication of the main contact position of equipment suitable for isolation		P
8.2.5.1	Condition of equipment for the tests		P
8.2.5.2.1	Dependent and independent manual operation		P
8.2.5.2.2	Dependent power operation		N
8.2.5.2.3	Independent power operation		N
8.2.5.3	Condition of equipment during and after test		N



EN 60947-1			
Clause	Requirement – Test	Result - Remark	Verdict
8.2.5.3.1	Dependent and independent manual operation		N
8.2.5.3.2	Dependent and independent power operation		N
8.2.7	Conduit pull-out test, torque test and bending test with metallic conduits		N
8.2.7.1	Pull-out test		N
8.2.7.2	Bending test		N
8.2.7.3	Torque test		N

8.3	Performance		P
8.3.1	Test sequences		P
8.3.2	General test conditions		P
8.3.2.1	General requirements		P
8.3.2.2	Test quantities		P
8.3.2.2.1	Values of test quantities		P
8.3.2.2.2	Tolerances on test quantities		P
8.3.2.2.3	Recovery voltage		P
	a) Power-frequency recovery voltage		P
	b) Transient recovery voltage		P
8.3.2.3	Evaluation of test results		P
8.3.2.4	Test reports		
8.3.3	Performance under no-load, normal load and overload conditions		P
8.3.3.1	Operation		P
8.3.3.2	Operating limits		P
8.3.3.2.1	Power operated equipment		P
8.3.3.2.2	Relays and releases		P
8.3.3.3	Temperature-rise		P
8.3.3.3.1	Ambient air temperature		P
8.3.3.3.2	Measurement of the temperature of parts		N
8.3.3.3.3	Temperature-rise of a part		P
8.3.3.3.4	Temperature-rise of the main circuit		P
	i) For values of test current up to and including 400 A:		N
8.3.3.3.5	Temperature-rise of control circuits		P
8.3.3.3.6	Temperature-rise of coils of electromagnets		P
8.3.3.3.7	Temperature-rise of auxiliary circuits		P
8.3.3.4	Dielectric properties		P
8.3.3.4.1	Type tests		P
8.3.3.4.2	Routine tests		P
8.3.3.4.3	Sampling tests for verification of clearances		P
8.3.3.4.4	Tests for equipment with protective separation		P
8.3.3.5	Making and breaking capacities		P
8.3.3.5.2	Test circuit		P
8.3.3.5.3	Characteristics of transient recovery voltage		P
8.3.3.5.5	Test procedure for making and breaking capacities		P
8.3.3.5.6	Behaviour of the equipment during and after making and breaking capacity tests		P
8.3.3.6	Operational performance capability		P
8.3.3.7	Durability		P



EN 60947-1			
Clause	Requirement – Test	Result - Remark	Verdict
8.3.3.7.1	Mechanical durability		P
8.3.3.7.2	Electrical durability		P
8.3.4	Performance under short-circuit conditions		N
8.3.4.1	General conditions for short-circuit tests		N
8.3.4.1.1	General requirements		N
8.3.4.1.2	Test circuit		N
	a) Figures 9, 10, 11 and 12 give the diagrams of the circuits to be used for the tests concerning		N
	b) The supply S feeds a circuit including resistors R1, reactors X and the equipment D under test.		N
	c) In each test circuit (Figures 9, 10, 11 and 12), the resistors and reactors are inserted between the supply source S and the equipment D under test. The positions of the closing device A and the current sensing devices (I1, I2, I3) may be different. The connections of the equipment under test to the test circuit shall be stated in the relevant product standard.		N
	d) All parts of the equipment normally earthed in service, including the enclosure or the screens, shall be insulated from earth and connected to a point as indicated in Figures 9, 10, 11 or 12.		N
8.3.4.1.3	Power-factor of the test circuit		N
8.3.4.1.4	Time-constant of the test circuit		N
8.3.4.1.5	Calibration of the test circuit		N
8.3.4.1.6	Test procedure		N
8.3.4.1.7	Behaviour of the equipment during short-circuit making and breaking tests		N
8.3.4.1.8	Interpretation of records		N
8.3.4.1.9	Condition of the equipment after the tests		N
8.3.4.2	Short-circuit making and breaking capacities		N
8.3.4.3	Verification of the ability to carry the rated short-time withstand current		N
	For this test, over-current releases, if any, likely to operate during the test, shall be rendered inoperative.		N
	a) For a.c. The tests shall be made at the rated frequency of the equipment with a tolerance of $\pm 25\%$, and at the power-factor appropriate to the rated short-time withstand current in accordance with Table 16.		N



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Clause	Requirement – Test	Result - Remark	Verdict
	b) For d.c. The current shall be applied for the specified time and its mean value determined from the record shall be at least equal to the specified value.		N
	c) Behaviour of the equipment during and after the test Behaviour of the equipment during the test shall be defined in the relevant product standard. After the test, it shall be possible to operate the equipment by its normal operating means.		N
8.3.4.4	Co-ordination with short-circuit protective devices and rated conditional short-circuit current		N
8.4	Tests for EMC		P
8.4.1	Immunity		P
8.4.1.1	Equipment not incorporating electronic circuits		P
8.4.1.2	Equipment incorporating electronic circuits		P
8.4.1.2.1	General		
8.4.1.2.2	Electrostatic discharges		P
8.4.1.2.3	Radiated radio-frequency electromagnetic fields		N
8.4.1.2.4	Electrical fast transients/bursts (EFT/B)		P
8.4.1.2.5	Surges		P
8.4.1.2.6	Conducted disturbances induced by radio-frequency fields		P
8.4.1.2.7	Power frequency magnetic fields		P
8.4.1.2.8	Voltage dips and interruptions		P
8.4.2	Emission		P
8.4.2.1	Equipment not incorporating electronic circuits		P
8.4.2.2	Equipment incorporating electronic circuits		P



EN 60947-2			
Clause	Requirement – Test	Result - Remark	Verdict
3	Classification		P
3.2	According to the method of operation of manually operated equipment		---
	dependent manual operation		P
	independent manual operation		N
	semi-independent manual operation		N
3.3	According to suitability for isolation		---
	suitable for isolation		P
	not suitable for isolation		N
4	Characteristics		---
4.2.2	Kind of current	a.c.	P
4.2.3	Number of positions of the main contacts	Three contacts	P
4.3	Rated and limiting values for the main circuit	There is no circuit	N
4.3.1	Rated voltages	AC415V	P
4.3.2	Currents		P
4.3.3	Rated frequency		N
4.3.4	Rated duty		P
4.3.4.1	Eight-hour duty		N
4.3.4.2	Uninterrupted duty		P
4.3.5	Normal load and overload characteristics		N
4.3.5.1	Ability to withstand motor switching overload currents	There is no motor	N
4.3.5.3	Rated making capacity		N
4.3.6	Short-circuit characteristics		N
4.3.6.1	Rated short-time withstand current		N
4.3.6.2	Rated short-circuit making capacity		N
4.3.6.4	Rated conditional short-circuit current		P
4.4	Utilization category	Isolating function	P
4.5	Control circuits	There is no circuit	N
4.6	Auxiliary circuits		N
4.7	Relays and releases		N
5	Product information		---
5.1	Nature of information		P
5.2	Marking		P



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Clause	Requirement – Test	Result - Remark	Verdict
5.2.1	Each equipment shall be marked in a durable and legible manner		P
5.2.2	The following data shall also be marked on the equipment but need not be visible from the front when the equipment is mounted:		---
	a) manufacturer's name or trade mark;		P
	b) type designation or serial number;		P
	c) rated operational currents (or rated powers) at the rated operational voltage and utilization category (see 4.3.1, 4.3.2 and 4.4);		P
	d) value (or range) of the rated frequency or the indication "d.c."		N
	e) for fuse-combination units, the fuse type and maximum rated current and the power loss of the fuse-link;		N
	f) IEC 60947-3, if the manufacturer claims compliance with this part;		P
	g) degree of protection of enclosed equipment.		P
5.2.3	The following terminals shall be identified:		---
	a) line and load terminals unless the connection is immaterial		P
	b) neutral pole terminal, if applicable, by the letter "N"		P
	c) protective earth terminal		P
5.2.4	The following data shall be made available in the manufacturer's published information:		---
	a) rated insulation voltage;		P
	b) rated impulse withstand voltage for equipment suitable for isolation or when determined;		P
	c) pollution degree, if different from 3;		N
	d) rated duty;		P
	e) rated short-time withstand current and duration, where applicable;		P
	f) rated short-circuit making capacity, where applicable;		N
	g) rated conditional short-circuit current, where applicable.		N
5.3	Instructions for installation, operation and maintenance		P
6	Normal service, mounting and transport conditions		P



EN 60947-2			
Clause	Requirement – Test	Result - Remark	Verdict
7	Constructional and performance requirements		P
7.1	Constructional requirements		P
7.1.2	Materials		---
	The suitability of materials used shall be verified with respect to resistance to abnormal heat and fire by conducting tests a) on the equipment; or b) on sections taken from the equipment; or c) on samples of identical material having a representative cross-section. If an identical material having a representative cross-section has already satisfied the requirements, then those tests need not be repeated.		P
7.1.2.2	Glow wire testing		P
	Subclause 7.1.2.2 of IEC 60947-1 applies with the following additions.		P
	Parts of insulating material necessary to retain current-carrying parts in position shall conform to the glow-wire tests of 8.2.1.1.1 of IEC 60947-1 at a test temperature of 960 °C.		P
7.1.4	Clearances and creepage distances		P
	Comply with the subclause 7.1.4 of IEC 60947-1		P
7.1.7	Additional requirements for equipment suitable for isolation		P
	Subclause 7.1.7 of IEC 60947-1 applies with the following additions.		P
7.1.7.1	Additional constructional requirements		P
	The equipment shall be marked according to 5.2.1 b).		P
7.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers		N
7.1.7.3	Supplementary requirements for equipment provided with means for padlocking the open position		P
7.1.9	Additional requirements for equipment provided with a neutral pole		P
	Subclause 7.1.9 of IEC 60947-1 applies except for the note referring to an over-current release.		P
7.1.12	Degrees of protection of enclosed equipment		P
7.2	Performance requirements		P



EN 60947-2			
Clause	Requirement – Test	Result - Remark	Verdict
7.2.1.1	a) The equipment shall be operated 15 times manually under no-load conditions in accordance with the manufacturer's instructions, 5 times by each of three persons. The velocity of the hand actuator at the instant of contact closure of the last closing contact shall be determined by oscillographic or other appropriate means at any convenient part of the device.		P
	b) The test apparatus shall ensure that the equipment under test fully closes and that there is no impediment to the free closing movement of the device. The actual test speed shall not exceed the mean velocity determined according to a).		P
7.2.2	Temperature rise		P
	Comply with the subclause 7.2.2 of IEC 60947-1		P
7.2.3	Dielectric properties		P
	Comply with the Subclause 7.2.3 of IEC 60947-1		P
7.2.3.1	Impulse withstand voltage		P
	Comply with subclause 7.2.3.1 of IEC 60947-1		P
	Clearances across the open contacts of a device not suitable for isolation shall withstand the test voltage comply with the Table 12 of IEC 60947-1		P
7.2.3.2	Power-frequency withstand voltage of the main, auxiliary and control circuits	There is no circuit	N
	Comply with Subclause 7.2.3.2 c) of IEC 60947-1		N
7.2.4	Ability to make and break under no-load, normal load and overload conditions	It is a disconnecter	N
7.2.4.1	Making and breaking capacities		N
	The rated making and breaking capacities are stated by reference to the rated operational voltage and rated operational current and to the utilization category according to Table 3.		N
7.2.4.2	Operational performance		P
	Tests concerning the verification of the operational performance of an equipment are intended to verify that the equipment is capable of making and breaking without failure the currents flowing in its main circuit for the intended use.		N
	The number of operating cycles and the test circuit parameters for the operational performance test for the various utilization categories are given in Tables 4 and 5.		N
7.2.4.3	Mechanical durability		N



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Clause	Requirement – Test	Result - Remark	Verdict
	Comply with Subclause 7.2.4.3.1 of IEC 60947-1		N
7.2.4.4	Electrical durability		N
	Comply with Subclause 7.2.4.3.2 of IEC 60947-1		N
7.2.5	Ability to make, break or withstand short-circuit currents		N
	The equipment shall be so constructed as to be capable of withstanding, under the conditions specified in this part, the thermal, dynamic and electrical stresses resulting from short-circuit currents.		N
	Short-circuit currents may be encountered during current making, current carrying in the closed position and current interruption.		N
7.2.7	Additional performance requirements for equipment suitable for isolation		P
	These requirements only apply to equipment with rated operational voltage greater than 50 V.		P
7.2.9	Overload requirements for equipment incorporating fuses	There is no fuse	N
	The main circuit of an equipment shall be capable of carrying an overload current according to 8.3.7.1 and shall not cause any damage of a nature which impairs the subsequent performance of the equipment in test sequence V.	There is no circuit	N
7.3	Electromagnetic compatibility		P
7.3.2	Immunity		---
7.3.2.1	Equipment not incorporating electronic circuits		P
	Equipment within the scope of this part standard not incorporating electronic circuits are not sensitive to electromagnetic disturbances in normal service conditions and therefore no immunity tests are required.		P
7.3.2.2	Equipment incorporating electronic circuits		N
	Equipment incorporating electronic circuits (e.g. an electronic fuse-blowing indicator) shall have a satisfactory immunity to electromagnetic disturbances (see 8.4.1.2).		N
7.3.3	Emission		P
7.3.3.1	Equipment		---



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Clause	Requirement – Test	Result - Remark	Verdict
	For equipment not incorporating electronic circuits, electromagnetic disturbances can only be generated during occasional switching operations. The duration of disturbances is in the order of milliseconds.		P
	The frequency, level and consequences of these emissions are considered as a part of the normal electromagnetic environment of low-voltage installations.		P
7.3.3.2	Equipment incorporating electronic circuits		N
	Equipment incorporating electronic circuits (e.g. an electronic fuse-blowing indicator) may generate continuous electromagnetic disturbances.		N
8	Tests		P
8.1.1	Comply with Subclause 8.1.1 of IEC 60947-1		P
8.1.2	Type tests		P
	Comply with Subclause 8.1.2 of IEC 60947-1		P
	Type tests are given in Table 9 of this part.		P
8.1.3	Routine tests		P
	Comply with Subclause 8.1.3 of IEC 60947-1 except the followings:		P
8.1.3.2	Mechanical operation test		P
	A test shall be made to verify the correct mechanical operation of the equipment by 5 closing and opening operations.		P
8.1.3.3	Dielectric test		P
	with the equipment in the open position, between each pair of terminals which are electrically connected together when the equipment is closed;		P
	with the equipment in the closed position, between each pole and the adjacent pole(s) and between each pole and the frame;		P
	for equipment incorporating electronic circuits connected to the main poles, with the equipment in the open position, between each pole and the adjacent pole(s) and between each pole and the frame, either on the incoming side or the outgoing side depending on the position of the electronic components.		N
	Alternatively, disconnection of the electronic circuit(s) is permitted during dielectric tests.		N



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Clause	Requirement – Test	Result - Remark	Verdict
8.1.4	Sampling tests		P
	Sampling tests for verification of clearances shall be complied with 8.3.3.4.3 of IEC 60947-1 in accordance with a recognized sampling plan		P
8.2	Type tests for constructional requirements		P
	Comply with Subclause 8.2 of IEC 60947-1		P
8.2.4	Mechanical properties of terminals		P
	Comply with Subclause 8.2.4 of IEC 60947-1		P
	Where equipment is designed to be provided with different designs of terminals, the tests shall be conducted on every design.		P
8.2.5	Verification of the effectiveness of indication of the main contacts position of equipment suitable for isolation		P
	Comply with Subclause 8.2.5 of IEC 60947-1		P
8.2.5.1	Condition of equipment for tests		P
	The test of the actuator mechanism and position indicating device shall be conducted as part of test sequence I	see 8.3.3 and Table 11	P
8.2.5.2.2	Dependent power operation		N
8.2.5.2.3	Independent power operation		P
8.2.5.3.1	Dependent and independent manual operation		N
8.2.5.3.2	Dependent and independent power operation		P
8.3	Performance		P
	Performance type tests to which equipment may be submitted according to its kind are listed in Table 9.		P
8.3.2	General test conditions		P
	The equipment at the start of any test sequence shall be in new and clean condition.		P
	The force applied for any opening operation shall not be greater than the test force determined in 8.2.5.2 and shall be applied in the same manner without shock		P
	Where doubt exists as to the correct opening operation, no more than 3 attempts to operate the equipment to the open position are allowed.		P
8.3.2.1.1	Simplified test for equipment having the same fundamental design		P



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Clause	Requirement – Test	Result - Remark	Verdict
	When submitting simultaneously a range of switches, disconnectors, switch-disconnectors or fuse combination units of the same fundamental design, the following variations are permitted provided the equipment complies in all other respects.		P
8.3.2.1.2	Requirements for equipment having the same fundamental design		P
	Switches, disconnectors, switch-disconnectors or fuse combination units shall be evaluated with respect to the following criteria during the determination of acceptance as the same fundamental design:		P
	a) the material, finish and dimensions of the current-carrying parts are identical, except for variation in design of terminals and means of fuse attachment;		N
	b) the contact size, material, configuration and method of attachment are identical;		P
	c) the operating mechanism is of the same fundamental design, materials and physical characteristics are identical;		P
	d) the closing and opening speeds of contacts are substantially the same;		P
	e) moulding and insulating materials are identical;		P
	f) method, materials and construction of any arc extinction device are identical. The following variations are also permitted:		P
	g) utilization category and operational voltage;		P
	h) application for 50 Hz or 60 Hz;		N
	i) three or four pole equipment (switched or non-switched neutral), provided the requirements of 7.1.9 are applicable;		P
	j) design of terminal provided that clearances and creepage distance are not reduced	See the table 12	P
	k) different types of actuators, either additional or integral, provided the requirements for strength of actuator are verified on each type of actuator, one of which during test sequence I;		P
	l) fuse-base contacts of switch-fuses, disconnector-fuses and switch-disconnector-fuse with different types of fuse-links (fuse-link removed only under no-load conditions).		N
8.3.3.1	Temperature-rise		P
	The test shall be made at the rated operational current I _e .		P



EN 60947-2			
Clause	Requirement – Test	Result - Remark	Verdict
	Fuse-combination units shall be fitted with fuse-links having a rated current equal to the conventional thermal current of the combination unit.		N
	The fuse-link shall have a power loss not exceeding the maximum value specified by the equipment manufacturer.		N
8.3.3.2	Test of dielectric properties		P
	For equipment suitable for isolation (see 3.3) having an operational voltage U_e greater than 50 V, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$ and shall not exceed 0,5 mA.		P
8.3.3.3	Making and breaking capacities		N
8.3.3.3.1	Test values and conditions		P
	The stated number of make-break operating cycles shall be made with a time interval between close-open cycles of $30\text{ s} \pm 10\text{ s}$ except that for equipment of conventional thermal current of 400 A or more, the time interval may be increased by agreement between manufacturer and user and the interval shall be stated in the test report.		P
	During each make-break operating cycle, equipment need only stay in the closed position for a period long enough to allow the switching operation to be completed and to enable the current value to be established and the moving parts of the equipment to come to rest. After each operating cycle, the recovery voltage shall be maintained for at least 0,05 s.		P
	For convenience of testing, equipment of utilization categories AC-23A and AC-23B, makebreak operating cycles may be replaced, with the agreement of the manufacturer, by the stated number of 10 I_e make cycles followed by the same number of 8 I_e break cycles.		N
	For a.c. the power-factor of the test circuit shall be determined in accordance with 8.3.4.1.3 of IEC 60947-1. The values shall be in accordance with Table 3.	There is no circuit	N
	For d.c. the time-constant of the test circuit shall be determined in accordance with 8.3.4.1.4 of IEC 60947-1. The values shall be in accordance with Table 3.		N



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Clause	Requirement – Test	Result - Remark	Verdict
	The test voltage and the load shall be applied to the appropriate terminals of the equipment. For equipment in which a moving contact remains connected to one of the terminals when the equipment is in the open position, this test shall be repeated with the supply and load connections interchanged, unless the terminals are specifically and clearly marked for load and supply.		P
	In the case of tests carried out on a fuse-switch or a fuse-switch-disconnector where the blades of the fuse-links are part of the make-breaking contacts, fuse-links shall be used.		N
	Details of the fuse-links used for the test, i.e. the manufacturer's name and reference, the rated current, the power loss of the fuse-link and the breaking capacity, shall be given in the test report.		N
	In the case of tests carried out on a switch-fuse or a switch-disconnector-fuse, fuse-links may be replaced by suitable copper links of dimensions and mass electrically equivalent to those of the fuse-links recommended by the manufacturer.		P
8.3.3.3.2	Test circuit		N
	Comply with Subclause 8.3.3.5.2 of IEC 60947-1		N
8.3.3.3.3	Transient recovery voltage		P
	Subclause 8.3.3.5.3 of IEC 60947-1 applies only to utilization categories AC-22 and AC-23. For tests for utilization categories DC-22 and DC-23 the test circuit load may be replaced by a motor producing the specified current and time constant value if agreed between manufacturer and user.		N
8.3.3.3.5	Behaviour of equipment during making and breaking capacity tests		N
	The equipment shall perform during the above tests in such a manner as not to endanger an operator or cause damage to adjacent equipment.		P
	There shall be no permanent arcing or flash-over between poles or between poles and frame and no melting of the fuse in the detection circuit.		N
	The equipment shall remain mechanically operable. Contact welding, such as to prevent an opening operation using normal operating means, is not permitted.		P



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Clause	Requirement – Test	Result - Remark	Verdict
8.3.3.3.6	Condition of equipment after the making and breaking capacity tests		N
	After the test and without maintenance the equipment shall comply with the requirements of 8.3.3.4.		N
	The contacts shall be in a suitable condition to carry the rated operational current without maintenance and shall comply with the temperature-rise verification of 8.3.3.6.		N
	If the equipment is suitable for isolation, it shall comply with 8.3.3.5 and 8.3.3.7.		N
8.3.3.4	Dielectric verification		P
	After the test according to 8.3.3.3, a test shall comply with clause 8.3.3.4.1 4) of IEC 60947-1.		P
8.3.3.5	Leakage current		P
	This test is made only on equipment suitable for isolation of rated operational voltage U_e greater than 50 V. The leakage current shall be checked across each contact gap and from each terminal to the frame.		P
	The value of leakage current, with a test voltage equal to 1,1 times the rated operational voltage of equipment shall not exceed – 0,5 mA per pole for equipment of utilization category AC-20A, AC-20B, DC-20A or DC-20B; – 2 mA per pole for equipment of all other utilization categories.		P
8.3.3.6	Temperature-rise verification		P
	After the tests according to 8.3.3.3, the temperature-rise of the terminals and accessible parts shall be checked according to 8.3.3.1 except that where a utilization category is assigned the tests are made at the rated operational current I_e of the equipment tested.	Enclosure: 32°C Plastic Screw: 29°C Inner disconnecter holder: 35°C	P
	The terminals and accessible parts shall not exceed the limiting values stated in Table 12.		P
8.3.3.7	Strength of actuator mechanism		P
	Shall be Subclause 8.2.5 applies to equipment suitable for isolation.		P
8.3.4	Test sequence II: operational performance capability		P
	This test sequence applies to the types of equipment listed in Table 13 and comprises the tests according to this table.		P
	They are made to verify compliance with 7.2.4.2.		P
8.3.4.1	Operational performance test		P



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Clause	Requirement – Test	Result - Remark	Verdict
8.3.4.1.1	Test values and conditions		P
	During each make-break operating cycle, the equipment need only stay in the closed position for a period long enough to allow the switching operation to be completed and to enable the current value to be established and the moving parts of the equipment to come to rest. After each operating cycle, the recovery voltage shall be maintained for at least 0,05 s.		N
	For a.c. the power-factor of the test circuit shall be determined in accordance with 8.3.4.1.3 of IEC 60947-1. The values shall be in accordance with Table 5.		N
	For d.c. the time-constant of the test circuit shall be determined in accordance with 8.3.4.1.4 of IEC 60947-1. The values shall be in accordance with Table 5.		N
8.3.4.1.2	Test circuit	Not used	N
8.3.4.1.3	Transient recovery voltage		P
8.3.4.1.4	Switching overvoltages	It is a disconnecter	N
8.3.4.1.5	Behaviour of the equipment during the operational performance test		P
	The equipment shall perform during the above tests in such a manner as not to endanger an operator or cause damage to adjacent equipment.		P
	There shall be no permanent arcing or flash-over between poles or between poles and frame and no melting of the fuse in the detection circuit.		N
	The equipment shall remain mechanically operable. Contact welding, such as to prevent an opening operation using normal operating means, is not permitted.		P
8.3.4.1.6	Condition of the equipment after the operational performance test		P
	It shall be demonstrated immediately after the test that the equipment will close and open satisfactorily during a no-load close/open operation.		P
	The force required for opening shall not be greater than the test force of 8.2.5.2 and Table 8.		P



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Clause	Requirement – Test	Result - Remark	Verdict
	A closing operation is considered satisfactory when normal operation of the handle through its full stroke will close the contacts sufficiently for the equipment to be able to carry its rated operational current.		P
	After the tests and without maintenance the equipment shall comply with the requirements of 8.3.4.2.		P
	The contacts shall be in a suitable condition to carry the rated operational current without maintenance and shall comply with the temperature-rise verification of 8.3.4.4.		P
	If the equipment is suitable for isolation, it shall comply with 8.3.4.3.		P
8.3.4.2	Dielectric verification		P
8.3.4.3	Leakage current		P
8.3.4.4	Temperature-rise verification		P
8.3.5	Test sequence III: short-circuit performance capability		N
	This test sequence applies to the types of equipment listed in Table 14 and comprises the tests according to this table.		N
	This test sequence is not mandatory if a value of rated short-circuit making capacity is not stated by the manufacturer (see 8.3.5.2.1) and test sequence IV (see 8.3.6) is carried out.		N
8.3.5.1	Short-time withstand current test		N
8.3.5.1.1	Test values and conditions. The test current shall be the rated short-time withstand current stated according to 4.3.6.1.		P
8.3.5.1.2	Test circuit		N
	For a.c., the power-factor of the test circuit shall be in accordance with 8.3.4.1.3 of IEC 60947-1.		N
	For d.c., the time-constant of the test circuit shall be in accordance with 8.3.4.1.4 of IEC 60947-1.		N
8.3.5.1.3	Test circuit calibration		N
	The calibration of the test circuit is carried out by placing temporary connections B of negligible impedance as close as reasonably possible to the terminals provided for connecting the equipment under test.		N



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Clause	Requirement – Test	Result - Remark	Verdict
	For a.c., resistors R1 and reactors X are adjusted so as to obtain, at the applied voltage, a current equal to the rated short-time withstand current as well as the power-factor as indicated in 8.3.4.1.3 of IEC 60947-1.		N
	For d.c., resistors R1 and reactors X are adjusted so as to obtain, at the applied voltage, a current the maximum value of which is equal to the rated short-time withstand current as well as the time-constant as indicated in 8.3.4.1.4 of IEC 60947-1.		N
8.3.5.1.4	Test procedure		P
	The temporary connections B are replaced by the equipment under test and the test current is applied for the specified time with the equipment in the closed position.		P
8.3.5.1.5	Behaviour of the equipment during the test		P
	The equipment shall perform during the test in such a manner as not to endanger an operator or cause damage to adjacent equipment.		P
	There shall be no permanent arcing or flash-over between poles or between poles and frame and no melting of the fuse in the detection circuit.		N
	The equipment shall remain mechanically operable. Contact welding, such as to prevent an opening operation using normal operating means, is not permitted.		P
8.3.5.1.6	Conditions of the equipment after the test		P
	It shall be demonstrated immediately after the test that the equipment will close and open satisfactorily during a no-load close/open operation.		P
	The force required for opening shall not be greater than the test force of 8.2.5.2 and Table 8.		P
	A closing operation is considered satisfactory when normal operation of the handle through its full stroke will close the contacts sufficiently for the equipment to be able to carry its rated operational current.		P
	After the test and without maintenance if the equipment is a switch or a switch-disconnector, it shall be subjected to the short-circuit making capacity test, 8.3.5.2, as listed in Table 14.		P
	If the equipment is suitable for isolation, it shall comply without maintenance with the dielectric verification of 8.3.5.3.		P



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Clause	Requirement – Test	Result - Remark	Verdict
	The contacts of a disconnecter shall be in a suitable condition without maintenance to carry the rated operational current and shall comply with the temperature-rise of 8.3.5.5.		P
8.3.5.2	Short-circuit making capacity test		N
8.3.5.2.1	Test values and conditions		P
	The test shall be made on the same equipment as for the test of 8.3.5.1 without any maintenance.		P
	The test current shall be that assigned by the manufacturer as stated in 4.3.6.2.		P
8.3.5.2.2	Test circuit		N
8.3.5.2.3	Test circuit calibration		N
8.3.5.3	Dielectric verification		P
8.3.5.4	Leakage current		P
	Subclause 8.3.3.5 applies, except that the maximum value of leakage current shall not exceed 2 mA per pole for all utilization categories.		
8.3.5.5	Temperature-rise verification		P
8.3.6	Test sequence IV: conditional short-circuit current		N
	This test sequence applies to the types of equipment listed in Table 15 and comprises the tests according to the table.		P
	This test sequence is not mandatory if a value of rated conditional short-circuit current is not stated by the manufacturer and test sequence III (see 8.3.5) is carried out.		P
	For switches, disconnectors and switch-disconnectors the short-circuit protective device of the equipment may be a circuit-breaker or a fuse and shall be arranged on the load side of the equipment under test.		P
	The type of circuit breaker or fuse shall be that stated by the manufacturer as suitable for the equipment.		N
	Details of the protective device used for the test i.e. manufacturer's name, type designation, rated voltage, current and short-circuit breaking capacity shall be given in the test report.		N



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Clause	Requirement – Test	Result - Remark	Verdict
	The type test with the specified protective device shall be deemed to cover the use of any other protective device having a Joule integral (I ² t) and cut-off current at the rated voltage, prospective current and power-factor not exceeding the specified values for the type of protective device used for the test.		N
	The tests are made to verify compliance with 7.2.5.		N
8.3.6.1	Circuit-breaker protected short-circuit withstand		N
8.3.6.2	Fuse protected short-circuit withstand		N
8.3.6.2.1	Test values and conditions		N
	The fuse-links shall be of the rated maximum current and rated breaking capacity deemed suitable by the manufacturer for use with the equipment.		N
	The test voltage to be used shall be equal to 1,05 U _e , where U _e corresponds to the operational voltage of the device under test.		N
	The test shall be made as follows. a) Withstand test A prospective current corresponding to the rated conditional short-circuit current stated by the manufacturer shall be applied with the equipment in the closed position. b) Making test After the withstand test of item a), all equipment according to Table 15 shall be fitted with new fuse-links and closed on to the rated conditional short-circuit current.		N
8.3.6.2.2	Test circuit		N
8.3.6.2.3	Test circuit calibration		N
8.3.6.2.5	Behaviour of the equipment during the test		P
8.3.6.2.6	Condition of the equipment after the test		P
8.3.6.3	Dielectric verification		P
8.3.6.4	Leakage current		P
8.3.6.5	Temperature-rise verification		P
8.3.7	Test sequence V: overload performance capability		P
	This test sequence applies to the types of equipment listed in Table 16 and comprises the tests according to the table.		P
8.3.7.1	Overload test		P



EN 60947-2			
Clause	Requirement – Test	Result - Remark	Verdict
	The equipment shall first be temperature conditioned at room temperature. The test current is 1,6 lthe or 1,6 lth for a period of 1 h, or until one or more of the fuses blow. If the time is less than 1 h, the time shall be recorded in the test report.		P
	Within 3 min to 5 min after the fuse(s) has (have) operated or the period of 1 h is over, the equipment shall be operated once, i.e. opened and closed. The equipment shall not have undergone any impairment hindering such operation. The force to open the equipment shall not be greater than the actuator test force of 8.2.5.2 and Table 8.	1 h is over, the equipment is operated.	P
8.3.7.2	Dielectric verification		P
8.3.7.3	Leakage current		P
8.3.7.4	Temperature-rise verification		P
	Fuse-links aged during the overload test according to 8.3.7.1 shall be replaced by new fuselinks of the same type and rating.		N
8.4	Electromagnetic compatibility tests		P
	Subclause 8.4 of IEC 60947-1 applies with the following addition.		N
	During tests, the following performance criterion applies: unintentional separation or closing of contacts shall not occur.		P
8.4.1	Immunity		---
8.4.1.1	Equipment not incorporating electronic circuits		P
8.4.1.2	Equipment incorporating electronic circuits		N
	The requirements of 7.3.2.2 apply. To verify compliance with these requirements, the tests contained in Table 6 shall be conducted.		P
8.4.2	Emission		---
8.4.2.1	Equipment not incorporating electronic circuits		P
8.4.2.2	Equipment incorporating electronic circuits		N
	Measurements shall be made in the operating mode, including grounding conditions, producing the highest emission in the frequency band being investigated which is consistent with normal service conditions (see Clause 6). Each measurement shall be performed in defined and reproducible conditions.		P
8.5.1	Mechanical durability		P



EN 60947-2			
Clause	Requirement – Test	Result - Remark	Verdict
	The mechanical durability test (see 7.2.4.3 and 8.1.5), where required, is made in accordance with the appropriate requirements of 8.3.4.1, except that for equipment suitable for isolation, the maximum value of leakage current shall not exceed 6 mA per pole for all utilization categories.		P
	The total number of operating cycles shall be as declared by the manufacturer.		P
8.5.2	Electrical durability		P
	The electrical durability test (see 7.2.4.4 and 8.1.5), where required, is made in accordance with the appropriate requirements of 8.3.4.1, except that for equipment suitable for isolation, the maximum value of leakage current shall not exceed 6 mA per pole for utilization categories AC-21, AC-22, AC-23, DC-21, DC-22 and DC-23.		P
	Equipment of utilization categories AC-20A, AC-20B, DC-20A and DC-20B is not submitted to this test.		P
	The total number of operating cycles shall be as declared by the manufacturer.		P



EN 60947-2			
Clause	Requirement – Test	Result - Remark	Verdict

ANNEX A:

Photo-documentation

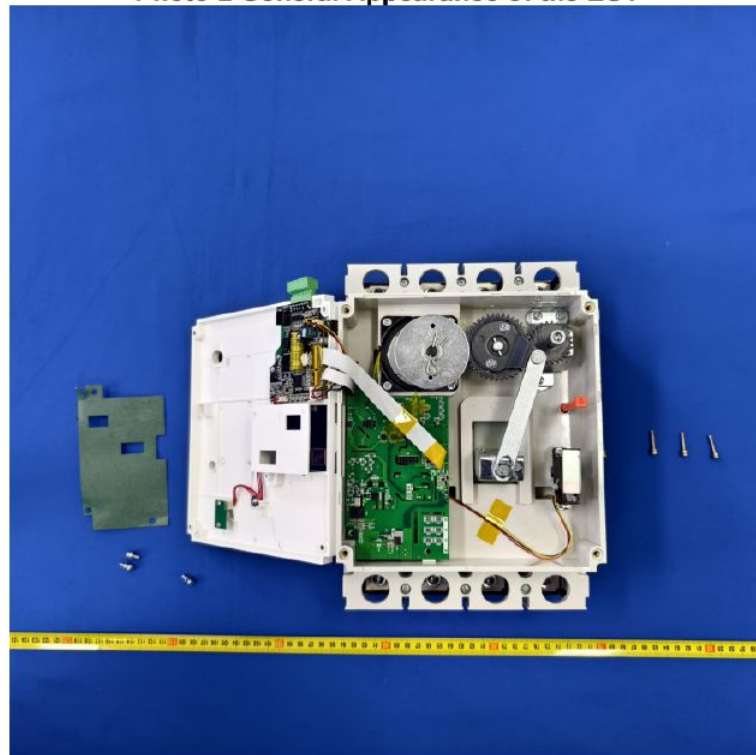


EN 60947-2			
Clause	Requirement – Test	Result - Remark	Verdict

Photo 1 General Appearance of the EUT



Photo 2 General Appearance of the EUT



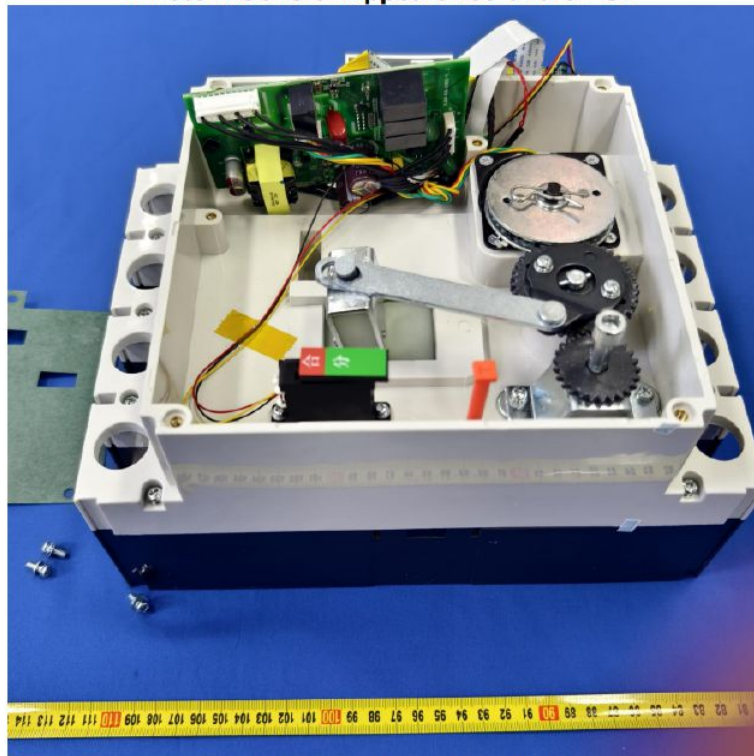


EN 60947-2			
Clause	Requirement – Test	Result - Remark	Verdict

Photo 3 General Appearance of the EUT



Photo 4 General Appearance of the EUT



End of the report

Vojenský technický ústav, s.p.
odštěpný závod VTÚPV
Vita Nejedlého 691, 682 01 Vyškov, Czech Republic

CERTIFICATE
N° VTÚPV - 104 / 2024 / ZAHR

Applicant: Shanghai Matis Electric Co., Ltd.
上海麦豆电气有限公司
Room 320, No.83, Huanhu West Third Road, Pudong New Area,
Shanghai, China

Product: Smart Metering MCCB

Tested Model: MTS3-EL630S
Derived Models: MTS3-EL125S, MTS3-EL250S, MTS3-EL400S

Manufacturer: Shanghai Matis Electric Co., Ltd.
Room 320, No.83, Huanhu West Third Road, Pudong New Area,
Shanghai, China

Rating and principal characteristics: Rated Voltage: 415 V AC;
Input Current: 630 A;
Output Current: 630 A;
Frequency: 50 Hz

Test results are described in the Test Reports No.:
XDAD237242612072326AR (tests made by BST Testing (Shenzhen) Co., Ltd.)

The sample of tested product conforms with the requirements of the following standards
harmonized with the LVD Directive No. 2014/35/EU.

- EN 60947-1: 2007 + A2: 2014
- EN 60947-2: 2017 + A1: 2020


This certificate is valid until: **12. 08. 2029**

After preparation of the necessary technical documentation as well as the conformity assessment,
required CE marking can be affixed on the product. Other relevant directives have to be observed.
The CE mark shall appear according to this sample:

CE

Vyškov 12. 08. 2024

Tel./Fax: +420 910 105 580
e-mail: milan.bezdek@vtusp.cz
<http://www.vtusp.cz>


Milan Bezdek
Certification Head



EU DECLARATION OF CONFORMITY

This Is Hereby Declared That Following Designated Product Complied With Theessential

Manufacturer Name: Shanghai Matis Electric Co., Ltd. Address: Room 320, No. 83, Huanhu West Third Road, Pudong New Area, Shanghai, China
Authorized Representative Established Within The Eu: Company Name: / Company Address: /
Product Name: Smart Metering MCCB
Model: MTS3-EL630S, MTS3-EL125S, MTS3-EL250S, MTS3-EL400S
Meets All Relevant Requirements Of The Following European Directives: 2014/35/Eu Low Voltage Directive
Applicable Standards: EN 60947-2:2017/A1:2020 EN 60947-1:2007/A2:2014

THIS DECLARATION APPLIES TO ALL SPECIMENS MANUFACTURED IDENTICAL TO THE MODELSUBMITTED FOR TESTING / EVALUATION. ASSESSMENT OF COMPLIANCE OF THE PRODUCT WITHTHE REOUIREMENTS RELATING TO SAFETY STANDARDS LISTED ABOVE WAS PERFORMED BYMANUFACTURE.

SIGNED ON BEHALF OF Shanghai Matis Electric Co., Ltd.



Title and Signature: _____

[Handwritten Signature]

Date and place: _____

2024.08.01 Shanghai

Seal: _____

