

TEST REPORT**EN 60947-3****Low-voltage switchgear and controlgear****Part 3: Switches, disconnectors, switch-disconnectors and fuse combination units**

Report Reference No.....	24ZCTB0119016SP
Tested by (name+signature).....	Mage Li
Approved by (name+signature).....	Jack Yang
Total number of pages.....	34 Pages
Date of issue.....	2024-01-29
Testing Laboratory.....	Shenzhen ZCT Technology Co., Ltd.
Address.....	3/F., Building 5, Hongsheng Industrial Zone, Bao'an Road, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China.
Applicant's name.....	Wenzhou Yijie Electric Co., Ltd
Address.....	No. 83, Fengquan Road, Tianhe Street, Wenzhou Economic and Technological Development Zone, Wenzhou City, Zhejiang Province
Test specification:	
Standard.....	EN IEC 60947-3:2021 used in conjunction with EN IEC 60947-1:2021
Test procedure.....	CE-LVD
Non-standard test method.....	N/A
Test Report Form No.....	EN60947_3A
Test Report Form(s) Originator.....	OVE
Master TRF.....	2016-04
Test item description.....	Isolator Switch
Trade Mark.....	N/A
Manufacturer.....	Wenzhou Yijie Electric Co., Ltd
Manufacturer address.....	No. 83, Fengquan Road, Tianhe Street, Wenzhou Economic and Technological Development Zone, Wenzhou City, Zhejiang Province
Model/Type reference.....	JX416300 JX412500, JX414000, JX416300, JX422500, JX424000, JX426300, JX434000, JX436300, JX444000, JX446300, JX449900, JX449800, JX410600, JX411000, JX411600, JX412000, JX413200, JX415000, JX418000, JX419900, JX419800, JX420600, JX421000, JX421600, JX422000, JX423200, JX425000, JX428000, JX429900, JX429800, JX430600, JX431000, JX431600, JX432000, JX432500, JX433200, JX435000, JX438000, JX439900, JX439800, JX440600, JX441000, JX441600, JX442000, JX442500, JX443200, JX445000, JX448000,
Ratings.....	Input:220V~ 50Hz 63A

TRF No. EN60947_3A



Summary of testing:

This test report includes:

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

Attachment 1: Photo documentation 7pages)

Summary of compliance with National Differences:

1. European group national differences.

Copy of marking plate

Isolator Switch

Model: JX416300

Input: 220V~ 50Hz 63A

Ouput:1000V



Wenzhou Yijie Electric Co., Ltd



Test item particular :	
- method of operation	Non manual
- switching positions	Vertical
- number of poles	/
- kind of current.....	AC
- number of phases	~
- rated frequency (Hz)	50
- number of positions of the main contacts.....	/
Rated and limiting values, main circuit	/
- rated operational voltage Ue (V).....	/
- rated insulation voltage Ui (V).....	/
- rated impulse withstand voltage Uimp (kV).....	/
- conventional free air thermal current Ith (A)	/
- conventional enclosed thermal current Ithe (A)	/
- rated operational current Ie (A).....	/
- rated uninterrupted current Iu (A)	/
- utilization category	N/A
Short-circuit characteristic.....	/
- rated short-time withstand current Icw (kA).....	/
- rated short-time making capacity Icm (kA).....	/
- rated conditional short-circuit current	/
Rated and limiting values, auxiliary circuits	/
- rated operational voltage (V)	/
- rated frequency (Hz)	/
- number of circuits.....	/
- number and kind of contact elements	/
Co-ordination of short-circuit protective devices	/
- kind of protective device	/
Possible test case verdicts:	
- test case does not apply to the test object.....	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement.....	F (Fail)
Testing	
Date of receipt of test item.....	2024-01-19
Date (s) of performance of tests.....	2024-01-19 to 2024-01-29



General remarks:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

General product information:

Isolator Switch, models

JX412500,JX414000,JX416300,JX422500,JX424000,JX426300,JX434000,JX436300,JX444000,JX446300,JX449900,JX449800,JX410600,JX411000,JX411600,JX412000,JX413200,JX415000,JX418000,JX419900,JX419800,JX420600,JX421000,JX421600,JX422000,JX423200,JX425000,JX428000,JX429900,JX429800,JX430600,JX431000,JX431600,JX432000,JX432500,JX433200,JX435000,JX438000,JX439900,JX439800,JX440600,JX441000,JX441600,JX442000,JX442500,JX443200,JX445000,JX448000,JXZE-1601

Checklist of Test

Item	Test	Clasue	Test result
1	Temperature rise	8.3.3.1	P
2	Test of dielectric properties	8.3.3.2	
3	Making and breaking capacities	8.3.3.3	
4	Dielectric verification	8.3.3.4	
5	Leakage current	8.3.3.5	
6	Temperature rise verification	8.3.3.6	
7	Strength of actuator mechanism	8.3.3.7	
II/8	Operational performance capacity (AC-22B)	8.3.4.1	P
9	Dielectric verification	8.3.4.2	
10	Leakage current	8.3.4.3	
11	Temperature verification	8.3.4.4	
III/12	Short-circuit performance capability	8.3.5.1	P
13	Short-time withstand current test	8.3.5.2	
14	Dielectric verification	8.3.5.3	
15	Leakage current	8.3.5.4	
16	Temperature-rise verification	8.3.5.5	P
17	Resistance to abnormal heat and fire	7.1.1.1	

N/A - test case does not apply to the test object

P(Pass) - test object does meet the requirement

F(Fail) - test object does not meet the requirement



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
5.2	MARKING		—
	Marking on equipment itself or on nameplate or nameplates attached to the equipment and legible from the front after mounting		P
	- indication of the open and closed position		P
	- suitability for isolation		P
	- disconnectors AC-20 and DC-20 only: marked "Do not operate under load"		P
	Marking on equipment not needed to be visible after mounting:		—
	- manufacturer's name or trademark	Wenzhou Yijie Electric Co., Ltd	P
	- type designation or serial number	See page 1	P
	- rated operational current	See rating label	P
	- rated operational voltage		P
	- utilization category		P
	- rated frequency		P
	- manufacturer's claim for compliance with IEC/EN 60947-3		P
	- degree of protection	3	P
	Marking on fuse-combination units:		—
	- fuse type	Fuse gL/gG	N
	- maximum rated current		P
	- power loss of the fuse-link		P
	Identification of terminals:		P
	- line terminals		P
	- load terminals		P
	- neutral pole terminal		P
	- protective earth terminal		P
	Data in the manufacturer's published information:		—
	- rated insulation voltage		P
	- rated impulse withstand voltage for equipment suitable for isolation or when determined		P
	- pollution degree, if different from 3		P
	- rated duty		P
	- rated short-time withstand current and duration		P
	- rated short-circuit making capacity		P
	- rated conditional short-circuit current		P



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
7.1	CONSTRUCTION		-
7.1.1	Materials		P
7.1.1.1	Resistance to abnormal heat and fire		P
	Glow-wire test according to IEC 60695-2-1/0 and IEC 60695-2-1/1		P
	Parts made of insulating material necessary to retain current-carrying parts in position: test temperature 960 °C Insulating parts retain current-carrying part: base stand		P
	No visible flame and no sustained glowing		P
	Flames and glowing extinguish within 30 s		P
	No ignition of the tissue paper		P
	Parts of insulating material not necessary to retain current-carrying parts in position, even though in contact with them: test temperature 650 °C		P
	No visible flame and no sustained glowing		P
	Flames and glowing extinguish within 30 s		P
	No ignition of the tissue paper		P
7.1.2	Current-carrying parts and their connection		P
7.1.3	Clearances		P
	Rated impulse withstand voltage		P
	Minimum clearances (mm)		—
	Measured clearances distances (mm)		P
	Creepage distances		P
	Pollution degree	3	—
	Comparative tracking index (V)		—
	Material group	IIIa	—
	Rated insulation voltage Ui (V)		—
	Minimum creepage distances (mm)	7.2	—
	Measured creepage distances (mm)	13.1	—
7.1.4	Actuator		N/A
7.1.4.1	Insulation		N/A
7.1.4.2	Direction of movement		N/A
7.1.5 of Part 1	Indication of contact position		N/A
7.1.5.1	Indicating means		N/A
7.1.5.2	Indication by the actuator		N/A
7.1.6	Additional safety requirements for equipment suitable for isolation		—



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.6.1	Additional constructional requirements for equipment suitable for isolation ($U_e > 50 \text{ V}$):		N/A
	- marking according to 5.2.1b		N/A
	- indication of the position of the contacts		N/A
	- construction of the actuating mechanism		N/A
	- minimum clearances across open contacts (see Table XIII, Part 1) (mm)		—
	- measured clearances (mm)		P
	- test U_{imp} across gap (kV)		N/A
7.1.6.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers:		-
	Auxiliary switch is rated according to IEC 60947-5-1 (unless the equipment is rated AC-23)		N/A
	Time interval between opening of the contacts of the auxiliary contact and the contacts of the main poles: $\geq 20 \text{ ms}$		—
	Measured time interval (ms)		N/A
	During the closing operation the contacts of the auxiliary switch closes after or simultaneously with the contacts of the main poles		N/A
7.1.6.3	Supplementary requirements for equipment provided with means for padlocking the open position:		N/A
	The locking means is so designed that it cannot be removed with the appropriate padlock(s) installed		N/A
	Test force F applied to the actuator in an attempt to operate to the closed position (N)		—
	Rated impulse withstand voltage (kV)		—
7.1.7	Test U_{imp} on open main contacts at the test force of terminals		P
7.1.7.1	All parts of terminals which maintain contact and carry current are of metal having adequate mechanical strength	(see 8.2.4 below)	P
	Terminal connections are such that necessary contact pressure is maintained	(see 8.2.4 below)	P
	Terminals are so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal	(see 8.2.4 below)	P



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminals do not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage is not reduced below the rated value	(see 8.2.4 below)	P
8.2.4	Mechanical properties of terminals		P
	Mechanical strength of terminals		P
	Maximum cross-sectional area of conductor (mm ²)		—
	Diameter of thread (mm)		—
	Torque (Nm)		—
	5 times on 2 separate clamping units		P
	Testing for damage to and accidental loosening of conductor (flexion test)		P
	Conductor of the smallest cross-sectional area (mm ²)		—
	Number of conductor of the smallest cross section		—
	Diameter of bushing hole (mm)		—
	Height between the equipment and the platen		—
	Mass at the conductor(s) (kg)		—
	135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit		P
	Pull-out test		P
	Force (N), applied for 1 min.		—
	During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit		
	Conductor of the largest cross-sectional area (mm ²)		—
	Number of conductor of the largest cross section .		—
	Diameter of bushing hole (mm)		—
	Height between the equipment and the platen		—
	Mass at the conductor(s) (kg)		—
	135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit		P
	Pull-out test		P
	Force (N), applied for 1 min.		—



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit		P
	Conductor of the largest and smallest cross-sectional area (mm ²)		—
	Number of conductor of the smallest cross section, number of conductor of the largest cross section ..		—
	Diameter of bushing hole (mm)		—
	Height between the equipment and the platen		—
	Mass at the conductor(s) (kg)		—
	135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit		N/A
	Pull-out test		N/A
	Force (N), applied for 1 min.....		—
	During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit		N/A
7.1.7.2	Connection capacity		N/A
	Type of conductors		—
	Minimum cross-sectional area of conductor (mm ²) :		—
	Maximum cross-sectional area of conductor (mm ²)		—
	Number of conductors simultaneously connectable to the terminal		—
7.1.7.3	Connection		N/A
	Terminals for connection to external conductors are readily accessible during installation		N/A
	Clamping screws and nuts do not serve to fix any other component		N/A
7.1.7.4	Terminal identification and marking		N/A
	Terminal intended exclusively for the neutral conductor		N/A
	Protective earth terminal		N/A
	Other terminals		N/A
7.1.8	Additional requirements for equipment provided with a neutral pole		N/A
	Equipment provided with a pole intended for the connection of neutral, this pole shall be clearly marked by the letter "N"		N/A
	The switched neutral pole does not break before and does not make after the other poles except		N/A



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- a pole having the appropriate short-circuit breaking and making capacity is used as neutral pole, all poles may operate together		N/A
	Conventional thermal current of neutral pole		N/A
7.1.9	Provisions for protective earthing		N/A
7.1.9.1	The exposed conductive parts are electrically interconnected and connected to a protective earth terminal		N/A
7.1.9.2	Protective earth terminal is readily accessible		N/A
	Protective earth terminal is suitably protected against corrosion		N/A
	Electrical continuity between the exposed conductive parts of the protective earth terminal and the metal sheathing of connecting conductors		N/A
	Protective earth terminal has no other functions		N/A
7.1.9.3	Protective earth terminal marking and identification		N/A
7.1.10	Enclosure for equipment		N/A
7.1.10.1	Design		N/A
	When the enclosure is opened, all parts requiring access for installation and maintenance are readily accessible		N/A
	Sufficient space is provided inside the enclosure		N/A
	The fixed parts of a metal enclosure are electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor		N/A
	Under no circumstances a removable metal part of the enclosure is insulated from the part carrying the earth terminal when the removable part is in place		N/A
	The removable parts of the enclosure are firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations		N/A
	When an enclosure is so designed as to allow the covers to be opened without the use of tools, means is provided to prevent loss of the fastening devices		N/A
	If the enclosure is used for mounting push-buttons, it is not possible to remove the buttons from the outside of the enclosure		N/A



EN 60947-3			
Clause	Requirement + Test		Verdict
7.1.10.2	Insulation		N/A
	If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining is securely fixed to the enclosure		N/A
7.1.11	Degree of protection of enclosed equipment		P
	Degree of protection	IP20	P
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		
	Procedure I: GENERAL PERFORMANCE CHARACTERISTICS		
	(NHR17-250; 3P, 4P, 660V/1000A)		
8.3.3.1	Temperature-rise		
	ambient temperature 10-40 °C	+28-+29°C	—
	test enclosure W x H x D (mm x mm x mm)		—
	material of enclosure		—
	Main circuits, test conditions:		
	- conventional thermal current I _{th} (A)	1,0x10 ³	—
	- conventional enclosed thermal current I _{the} (A) ...		—
	- cable/busbar cross-section (mm ²) / length (mm) ..	2(60x5)mm ²	—
	Fuse-link details (fuse-combination units only):		
	- manufacturer's name, trademark or identification mark		—
	- manufacturer's model or type reference		—
	- rated current (A)		—
	- power loss (W)		—
	- rated breaking capacity (kA)		—
	Temperature-rise of phase poles		P
	Input terminal: <=65K	L1; L2; L3; L4 55; 49; 51; 53	P
	Output terminal: <=65K	L1; L2; L3; L4 50; 46; 45; 62	P
	Temperature-rise of neutral pole (if applicable)		P
	Temperature-rise of accessible parts		P
	Manual operatin part accessible and not griped :		P
	Metallic part:<=15K		P
	Non metal part <=25K		P
	Accessible parts can not be griped		P



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Metallic part: $\leq 40K$		P
	Non metal part $\leq 50K$		P
	Auxiliary circuits, test conditions:		P
	- rated operation current (A)		—
	- cable cross-section (mm ²).....		P
	Temperature-rise of terminals	(see appended table)	P
	Temperature-rise of accessible parts	(see appended table)	P
8.3.3.2	Test of dielectric properties (test performed on sample #01, model NH40-1250)		P
	Rated impulse withstand voltage (kV)		—
	- test Uimp main circuits (kV)		N/A
	- test Uimp auxiliary circuits (kV)		N/A
	- test Uimp on open main contacts (equipment suitable for Isolator Switch)		N/A
	2) Power-frequency withstand voltage (V)	220Vac, 50Hz	—
	- main circuits, test voltage for 5 sec. (V)		P
	- control and auxiliary circuits, test voltage for 5 sec. (V)		N/A
	Devices, which have been disconnected for the power-frequency withstand voltage test		N/A
	The contactor as normal location, all terminals are connected on main circuit (including control circuit and auxiliary circuit to main circuit), and enclosure, or installation plate		N/A
	The contactor as normal working location, each pole of main circuit to the other pole parallel connection together.		N/A
	Control circuit and auxiliary circuit to the following parts:		N/A
	- main circuit		N/A
	- other circuit		N/A
	- accessible wire		N/A
	- enclosure and installation plate		N/A
	3), measurement of leakage current		P
	Test voltage: 1,1U	1100	P
	Leakage current: $\leq 0,5mA$ (disconnection condition, between each contator)		N/A



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.3	Making and breaking capacity (AC-22B) (test performed on sample #01, model NH40-1250)		P
	- utilization category		—
	- rated operational voltage U_e (V)		—
	- rated operational current I_e (A) or power (kW)		—
	Conditions for make/break operations or make operation, AC-23A and AC-23B only:		P
	- test voltage, $U = 1,05 U_e$ (V):	$(1,05 \times 1000)_0^{+5\%} = 1050V$ L1: L2: L3:	—
	- test current, $I = \dots \times I_e$ (A):	$(3 \times 125)_0^{+5\%}$ A L1: L2: L3:	—
	- power factor: 0,65+/-0,05	0,64 L1: L2: L3:	—
	Conditions for break operation, AC-23A and AC-23B only:		
	- test voltage, $U = 1,05 U_e$ (V):	L1: L2: L3:	—
	- test current, $I = \dots \times I_e$ (A):	L1: L2: L3:	—
	- power factor	L1: L2: L3:	—
	Conditions for make/break operations, other than AC-23A/B:		
	- test voltage, $U = 1,05 U_e$ (V):	L1: L2: L3:	—
	- test current, $I = \dots \times I_e$ (A):	L1: L2: L3:	—
	- power factor/ time constant	L1: L2: L3:	—



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Test circuit osillograph trace:		—
	Number of make/break or make and break operations	5	N/A
	- recovery voltage duration (≥ 50 ms)		N/A
	- current duration (ms)	f : 60,5+/-10kHz ; f =56,2 γ : 1,1+/-0,05 ; γ =1,08	—
	- time interval between operations	3 min +/- 1min	N/A
	No arc		P
	Operation force after test:		-
	Force disconnected the equipment $F \leq 6000N$	250	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		N/A
	- oscillatory frequency (kHz)		—
	- measured oscillatory frequency (kHz)	L1: L2: L3:	N/A
	- factor γ	L1: L2: L3:	N/A
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		N/A
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		N/A
8.3.3.4	Dielectric verification		P
	test voltage: $2 \cdot U_e$ with a minimum of 1000V~.....		—
	Applied time:	5s	
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 U_e) (V)		—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole	0,05	P
	Leakage current (other utilization categories): ≤ 2 mA/pole)	0,05	P
8.3.3.6	Temperature-rise verification		P
	Ambient temperature: +10°C-40°C	+27-28	P
	- conductor cross-section (mm ²)		—
	- test current I_e (A)		—



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Temperature-rise of main circuit terminals (≤ 80 K)		-
	input terminal	L1, L2, L3, L4 46,47, 58, 57	P
	output terminal	L1, L2, L3, L4 52, 56, 63,55	P
8.3.3.7	Strength of actuator mechanism		-
	Dependent and independent manual operation		-
	Number of contactor	16	-
	Method for keep contactor closed	L1 pole contactor welding	P
	Force for disconnection of equipment F(N)	600	250
	Duration	10s	-
Procedure II: GENERAL PERFORMANCE CHARACTERISTICS			
(test performed on sample #02, model NHR17-250)			
8.3.3.1	Temperature-rise		
	ambient temperature 10-40 °C	+28-+29	—
	test enclosure W x H x D (mm x mm x mm)		—
	material of enclosure		—
	Main circuits, test conditions:		
	- conventional thermal current I _{th} (A)		—
	- conventional enclosed thermal current I _{the} (A) ... :		—
	- cable/busbar cross-section (mm ²) / length (mm).. :		—
	Fuse-link details (fuse-combination units only):		
	- manufacturer's name, trademark or identification mark		—
	- manufacturer's model or type reference		—
	- rated current (A)		—
	- power loss (W)		—
	- rated breaking capacity (kA)		—
	Temperature-rise of phase poles		P
	Input terminal: ≤ 65 K	L1, L2, L3, L4 49, 50, 47, 50	P
	Output terminal: ≤ 65 K	L1, L2, L3, L4 45, 55,54, 52	P
	Temperature-rise of neutral pole (if applicable)		P



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Temperature-rise of accessible parts		P
	Manual operatin part accessible and not griped :		P
	Metallic part: $\leq 15K$	/	P
	Non metal part $\leq 25K$	15	P
	Accessible parts can not be griped	/	P
	Metallic part: $\leq 40K$	32	P
	Non metal part $\leq 50K$	34	P
	Auxiliary circuits, test conditions:		P
	- rated operation current (A)		—
	- cable cross-section (mm ²).....		P
	Temperature-rise of terminals	(see appended table)	P
	Temperature-rise of accessible parts	(see appended table)	P
8.3.3.2	Test of dielectric properties (test performed on sample #02, model NHR17-160/30)		P
	Rated impulse withstand voltage (kV)	1,2/50 μ s	—
	- test Uimp main circuits (kV)		N/A
	- test Uimp auxiliary circuits (kV)		N/A
	- test Uimp on open main contacts (equipment suitable for Isolator Switch)		N/A
	2) Power-frequency withstand voltage (V)		—
	- main circuits, test voltage for 5 sec. (V)		P
	- control and auxiliary circuits, test voltage for 5 sec. (V)		N/A
	Devices, which have been disconnected for the power-frequency withstand voltage test		N/A
	The contactor as normal location, all terminals are connected on main circuit (including control circuit and auxiliary circuit to main circuit), and enclosure, or installation plate		N/A
	The contactor as normal working location, each pole of main circuct to the other pole parallel connection together.		N/A
	Control circuit and auxiliary circuit to the following parts:		N/A
	- main circuit		N/A
	- other circuit		N/A
	- accessible wire		N/A
	- enclosure and installation plate		N/A



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	3), measurement of leakage current		P
	Test voltage: 1,1x480V		P
	Leakage current: $\leq 0,5\text{mA}$ (disconnection condition, between each contator)	0,05	N/A
8.3.3.3	Making and breaking capacity (AC-22B) (NHR17-250)		P
	- utilization category		—
	- rated operational voltage U_e (V)		—
	- rated operational current I_e (A) or power (kW)		—
	Conditions for make/break operations or make operation, AC-23A and AC-23B only:		P
	- test voltage, $U = 1,05 U_e (1,05 \times 1000)_0^{+5\%}$ (V):	1050V L1: L2: L3:	—
	- test current, $I = (0,3 \times 1000)_0^{+5\%} \text{ A} \times I_e$ (A):	$0,3 \times 10^3$ L1: L2: L3:	—
	- power factor	L1: L2: L3:	—
	Conditions for break operation, AC-23A and AC-23B only:		
	- test voltage, $U = 1,05 U_e$ (V):	L1: L2: L3:	—
	- test current, $I =$ $\times I_e$ (A):	L1: L2: L3:	—
	- power factor	L1: L2: L3:	—
	Conditions for make/break operations, other than AC-23A/B:		
	- test voltage, $U = 1,05 U_e$ (V):	L1: L2: L3:	—



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- test current, $I = \dots \times I_e$ (A):	L1: L2: L3:	—
	- power factor/ time constant :	L1: L2: L3:	—
	Test circuit osillograph trace:		
	Number of make/break or make and break operations :	5	N/A
	- recovery voltage duration (≥ 50 ms)		N/A
	- current duration (ms) :	$f: 55,1 \pm 10\text{kHz}$; $f = 53,2$ $\gamma: 1,1 \pm 0,05$; $\gamma = 1,05$	—
	- time interval between operations :	3 min +/- 1min	N/A
	No arc		P
	Operation force after test:		-
	Force disconnected the equipment $F \leq 6000\text{N}$	1000	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		N/A
	- oscillatory frequency (kHz) :		—
	- measured oscillatory frequency (kHz) :	L1: L2: L3:	N/A
	- factor γ :	L1: L2: L3:	N/A
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		N/A
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		N/A
8.3.3.4	Dielectric verification		P
	test voltage: $2 \times U_e$ with a minimum of 1000V~.....:		—
	Applied time:	5s	
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 U_e) (V)		—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole	0,05	P
	Leakage current (other utilization categories): ≤ 2 mA/pole)	0,06	P



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.6	Temperature-rise verification		P
	Ambient temperature: +10°C-40°C	+27-28	P
	- conductor cross-section (mm ²)		—
	- test current I _e (A)	1,0x10 ³	—
	Temperature-rise of main circuit terminals (≤ 80 K)		-
	input terminal	L1, L2, L3, L4 40, 45, 50, 49	P
	output terminal	L1, L2, L3, L4 51, 54, 59, 51	P
8.3.3.7	Strength of actuator mechanism		-
	Dependent and independent manual operation		-
	Number of contactor	16	-
	Method for keep contactor closed	L1 pole contactor welding	P
	Force for disconnection of equipment F(N)	600N	P
	Duration	10s	
8.2.5	Verification of the strength of actuator mechanism and position indicating device		P
	- actuator type (fig.)		—
8.2.5.2.1	Dependent and independent manual operation		P
	- actuating force for opening (N)		—
	- test force with blocked main contacts (N)		—
	During and after the test, open position not indicated.....		P
	No locking in the open position while test force is applied.....		P
8.2.5.2.2	Dependent power operation		P
	- main contacts fixed together in the closed position		P
	- 110% of the rated supply voltage applied to the equipment (3 times)		P
	During and after the test, open position not indicated.....		P
	Equipment show no damage impairing its normal operation		P
	No locking in the open position while test force is applied.....		P



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Independent power operation		P
	- main contacts fixed together in the closed position		P
	- stored energy of the power operator released (3 times)		P
	During and after the test, open position not indicated.....		P
	Equipment show no damage impairing its normal operation		P
	No locking in the open position while test force is applied.....		P
8.3.4	TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (model NHR17-250 4P, 660V/1600A)		-
8.3.4.1	Operational performance test		-
	- utilization category		—
	- rated operational voltage (V)		—
	- rated operational current (A)		—
	Test conditions for electrical operation cycles:		
	- test voltage (V) : $1000^{+5\%}_0$	968.5 L1: L2: L3:	—
	- test current (A) : $1600^{+5\%}_0$	2A L1: L2: L3:	—
	- power factor/time constant : 0,80+/-0,05	0,77 L1: L2: L3:	—
	Number of cycles with current..... 100	100	P
	Number of cycles without current	500	P
	First test sequence (with/without current)		—
	Second test sequence (with/without current)		—
	- time interval between first and second test sequence	>0,05	—
	Operation force after test		-
	Disconnection force for equipment		P



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current oscillograph trace:		-
8.3.4.1.5	Behaviour of the equipment during the operational performance test		P
8.3.1.1.6	Condition of the equipment after the operational performance test		P
8.3.4.2	Dielectric verification		P
	test voltage: $2 \cdot U_e$ with a minimum of 1000V~.....:		—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 U_e) (V) : 1,1 x 660V		—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole	0,05	P
	Leakage current (other utilization categories) ≤ 2 mA/pole	0,05	P
8.3.4.4	Temperature-rise verification		P
	Temperature rise of main circuit terminals ≤ 80 K . :	+22-+30	P
	- conductor cross-section (mm ²)		—
	- test current I_e (A) : 63A		—
	Temperature-rise of accessible parts		P
	Manual operatin part accessible and not griped :		P
	Metallic part: $\leq 15K$	/	P
	Non metal part $\leq 25K$	17	P
	Accessible parts can not be griped	/	P
	Metallic part: $\leq 40K$	26	P
	Non metal part $\leq 50K$	/	P
	Not accessible parts can not be griped during normal operation	/	P
	Metallic part: $\leq 40K$	33	P
8.3.5	TEST SEQUENCE III: SHORT-CIRCUIT PERFORMANCE CAPABILITY (model NHR17-250, test sample #04, 4P, 660V / 1600A)		P
8.3.5.1	Short-time withstand current test		P
	Rated short-time withstand current I_{cw} (A) ($>12 \cdot I_e$ max) :		P
	test voltage (V) : $(1,05 \times 1000V)^{+5\%}_0$	L1: L2: L3:	—



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	r.m.s. test current (A) : $(30/63)^{+5\%}_0$	L1: L2: L3:	—
	peak test current (A)	L1: L2: L3:	—
	power factor/time constant	L1: L2: L3:	—
	test duration (s)	1s	—
	$\cos\Phi$: $0,25^{+0}_{-0,05}$	0,19	P
	Prospective current osillograph trace:		-
	Test current osillograph trace:		-
8.3.5.1.5	Behaviour of the equipment during the test		P
8.3.5.1.6	Conditions of the equipment after the test		P
8.3.5.2	Short-circuit making capacity		P
	Rated short-circuit making capacity Icm (A)		P
	test voltage $(1.05 \times U_e)$ (V): $(1,05 \times 660V)^{+5\%}_0$	L1: L2: L3:	—
	r.m.s. test current (A) : $50^{+5\%}_0$	50 L1: L2: L3:	—
	maximum peak test current (factor n)		P
	power factor/time constant :	L1: L2: L3:	P
	current duration (s) : 0,05	>0,05	—
	Time interval between the cycles	3 min	—
	$\cos\Phi$: $0,25^{+0}_{-0,05}$	0,25	-
	No of test:	2	-
	Arc fuse: $\Phi 0,8\text{mm}$		P
	Operation force after test:		-
	Force for disconnection of equipment $F < 600\text{N}$	255	P



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current oscillograph trace:		-
	Test "1" current oscillograph trace:		-
	Test "2" current oscillograph trace:		-
8.3.5.2.5	Behaviour of the equipment during the test		P
8.3.5.2.6	Conditions of the equipment after the test		P
8.3.5.3	Dielectric verification		P
	test voltage: $2 \cdot U_e$ with a minimum of 1000V~..... :		—
	No flashover or breakdown		P
8.3.5.4	Leakage current		P
	test voltage (1,1 U_e) (V) : 1,1 x 1000V		—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole :	0,05	P
	Leakage current (other utilization categories) $\leq 2,0$ mA/pole :	0,05	P
8.3.5.5	Temperature-rise verification		P
	Ambient temperature : +10°C-+40°C	+30	-
	Temperature-rise of main circuit terminals ≤ 80 K . :		P
	Input terminal:		P
	Output terminal:		P
	- conductor cross-section (mm ²) :		—
	- test current I_e (A) : 1600	$1,6 \times 10^3$	—
	Manual operatin part accessible and not griped :		P
	Metallic part: $\leq 15K$	/	P
	Non metal part $\leq 25K$	14	P
	Accessible parts can not be griped	/	P
	Metallic part: $\leq 40K$	36	P
	Non metal part $\leq 50K$	/	P
	Not accessible parts can not be griped during normal operation	/	P
	Metallic part: $\leq 40K$	31	P
	Non metal part $\leq 50K$	/	P
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark :		—
	- manufacturer's model or type reference :		—



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- rated voltage (V)		—
	- rated current (A)		—
	- rated breaking capacity (kA)		—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V)		—
	test current (kA)	L1: L2: L3:	—
	rated frequency (Hz)		—
	power factor		—
	Time constant (ms)		—
	Fuse protected short-circuit withstand (equipment in closed position)		P
	- max. let-through current (kA)	L1: L2: L3:	—
	- Joule integral I^2dt (A ² s)	L1: L2: L3:	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s)		—
	- point at which the measurement is made		—
	- test speed during the fuse protected short-circuit making (m/s)		—
	- max. let-through current (kA)	L1: L2: L3:	—
	- Joule integral I^2dt (A ² s)	L1: L2: L3:	—
8.3.6.2.5	Behaviour of the equipment during the test		P
8.3.6.2.6	Conditions of the equipment after the test		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~.....		—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V)		—



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole		P
	Leakage current (other utilization categories) $\leq 2,0$ mA/pole		P
8.3.6.5	Temperature-rise verification		P
	Temperature-rise of main circuit terminals ≤ 80 K . :		P
	Ambient: $+10^{\circ}\text{C}\sim+40^{\circ}\text{C}$	$+20^{\circ}\text{C}$	
	- conductor cross-section (mm^2)		—
	- test current I_e (A)		—
	Temperature limit:		
	Input terminal $< 80\text{K}$	L1: 65; L2: 59; L3: 63	-
	Output terminal: $\geq 80\text{K}$	L1: 85; L2: 94; L3: 101	-
	Manual operation part: metal part: $\leq 25\text{K}$ non-metal part: $\leq 35\text{K}$	/ 23	
	Accessible part and not hand held part: metal part: $\leq 40\text{K}$ non-metal part: $\leq 50\text{K}$	/ 46	
	Not accessible part on normal operation: metal part: $\leq 50\text{K}$ non-metal part: $\leq 60\text{K}$	/ 41	
8.3.7	TEST SEQUENCE V: OVERLOAD PERFORMANCE CAPABILITY		P
8.3.7.1	Overload test		P
	ambient temperature $10-40^{\circ}\text{C}$		—
	test enclosure W x H x D ($\text{mm} \times \text{mm} \times \text{mm}$)		—
	material of enclosure		—
	test current $1,6I_{th}$ or $1,6I_{th}$ (A)		—
	cable/busbar cross-section (mm^2) / length (mm) ... :		—
	Fuse-link details:		P
	- manufacturer's name, trademark or identification mark		—
	- rated current (A)		—
	- power loss (W)		—
	- rated breaking capacity (kA)		—
	- time duration of the overload test (s)		—



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Within 3 min after the fuse(s) has(have) operated (or 1 h), the equipment has been operated once, i.e. opened and closed		P
	The equipment has not undergone any impairment hindering such operation		P
8.3.7.2	Dielectric verification		P
	test voltage: $2 \cdot U_e$ with a minimum of 1000V~		—
	No flashover or breakdown		P
8.3.7.3	Leakage current		P
	test voltage (1,1 U_e) (V)		—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole		P
	Leakage current (other utilization categories) ≤ 2 mA/pole		P
8.3.7.4	Temperature-rise verification		P
	Temperature-rise of main circuit terminals ≤ 80 K (K)		P
	- conductor cross-section (mm ²)		—
	- test current I_e (A)		—
8.4	ELECTROMAGNETIC COMPATIBILITY TESTS		
8.4.1	Immunity (for equipment incorporating electronic circuits)		N/A
7.3.2.2	Tests of table 6	(see appended tables)	N/A
	No unintentional separation or closing of contacts has occurred during these tests		N/A
8.4.2	Emission (for equipment incorporating electronic circuits)		N/A
7.3.3.2	Tests of table 7	(see appended tables)	N/A
	No unintentional separation or closing of contacts has occurred during these tests		N/A



EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict

Appended table:

Temperature-rise measurements			
temperature rise dT of part:	phase	dT (K) measured	dT (K) required
Input terminal	L1	49	65
Input terminal	L2	55	65
Output terminal	L1	54	65
Output terminal	L2	49	65
Manual operation parts (metal part)		/	15
Manual operation parts (non metallic part)		15	25
Accessible part (not griped, metal)		/	30
Accessible part (not griped, non-metallic parts)		23	40
Not accessible part during normal operation		/	40
Not accessible part during normal operation		45	50

Remarks:

ANNEX 1: components						—
object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Enclosure	B	KINGFA SCI & TECH CO LTD	HFFA66- RPG25	V-0, 130°C	UL 94, UL 746	Test with appliance +UL E171666

No.	mark of conformity	No.	mark of conformity	No.	mark of conformity	No.	mark of conformity
1		2	VDE	3	SEV	4	ÖVE
5	DEMKO	6	SEMKO	7	NEMKO	8	FIMKO
9	BSI	10	UL	11	CSA	12	LCIE
13	IMQ	14	BNL	15	CEBEC	16	KEMA

The codes above have the following meaning:

A – The component is replaceable with another one, also certified, with equivalent characteristics

B – The component is replaceable if authorised by the test house

C – Integrated component tested together with the appliance

D – Alternative component



Attachment 1- Photo Document

Photo 1

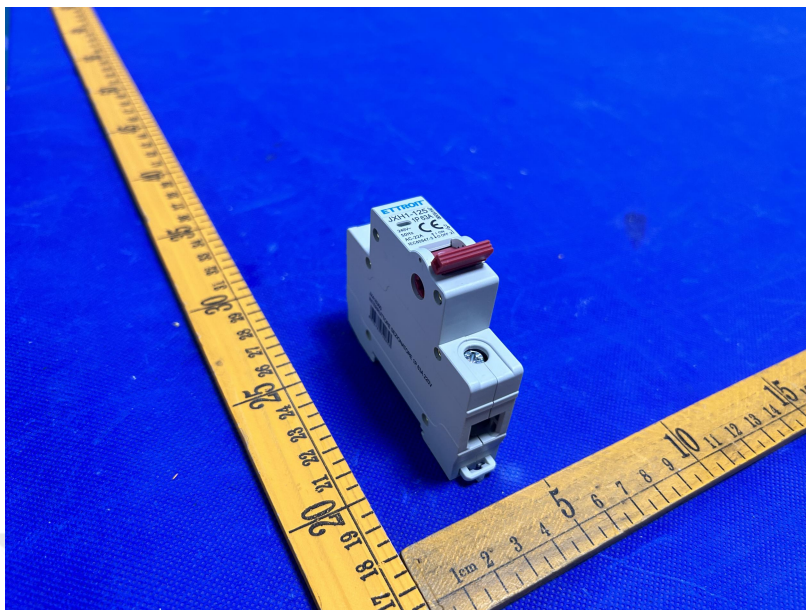


Photo 2

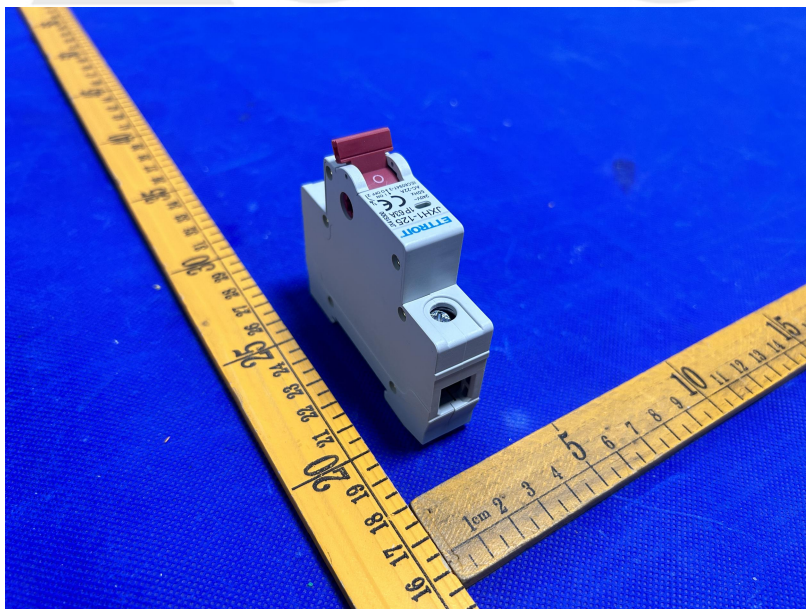


Photo 3



Photo 4



Photo 5

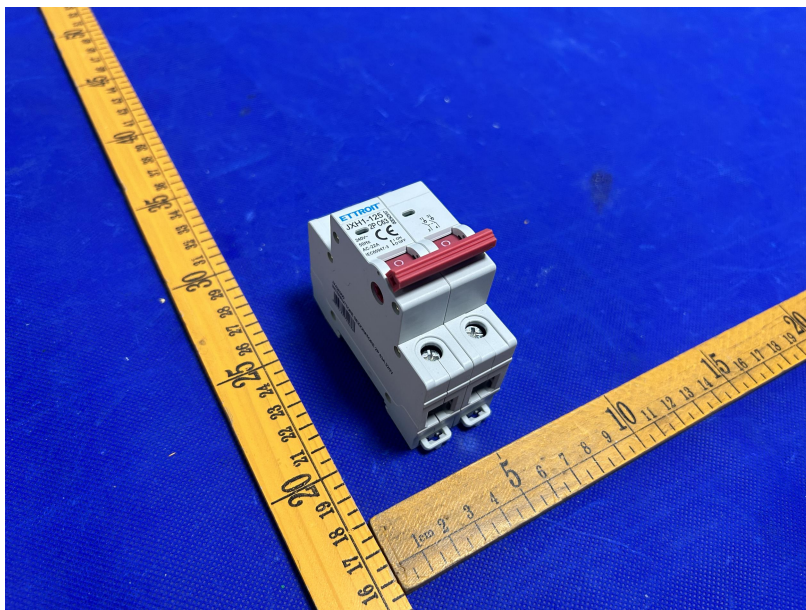


Photo 6



Photo 7

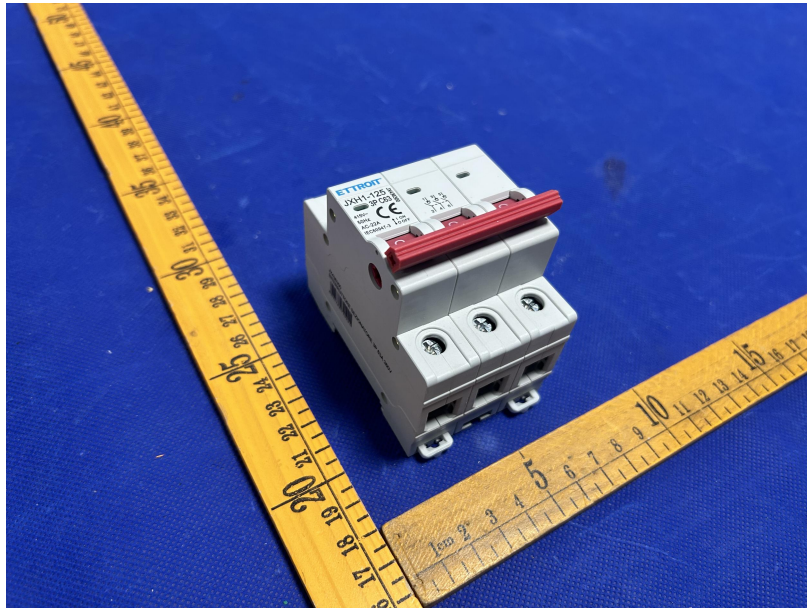


Photo 8



Photo 9

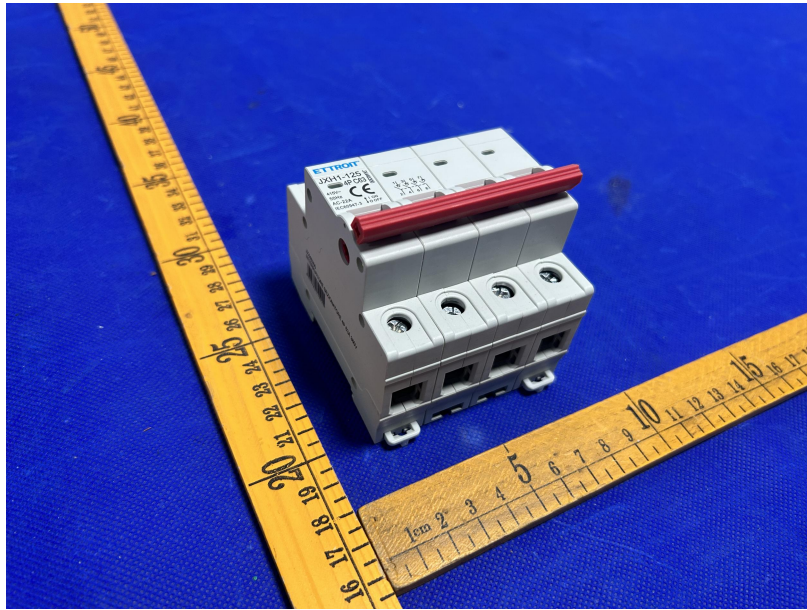


Photo 10

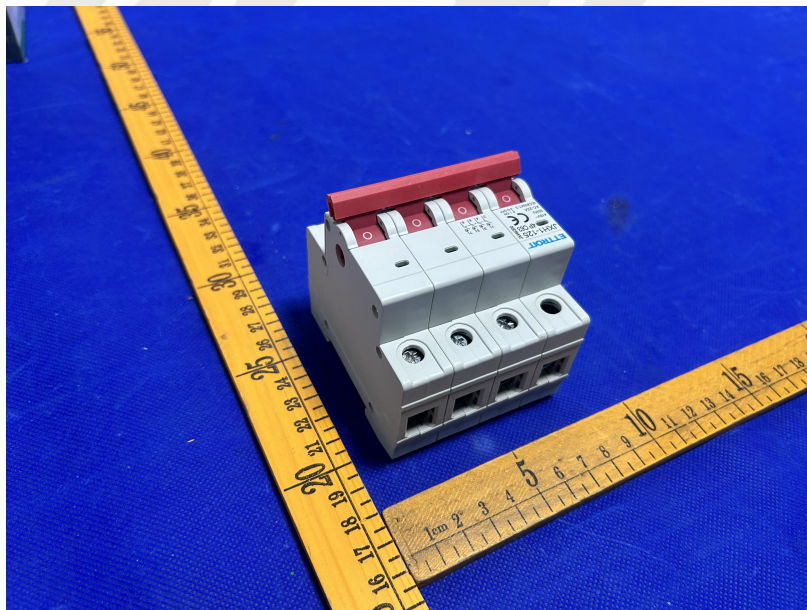


Photo 11

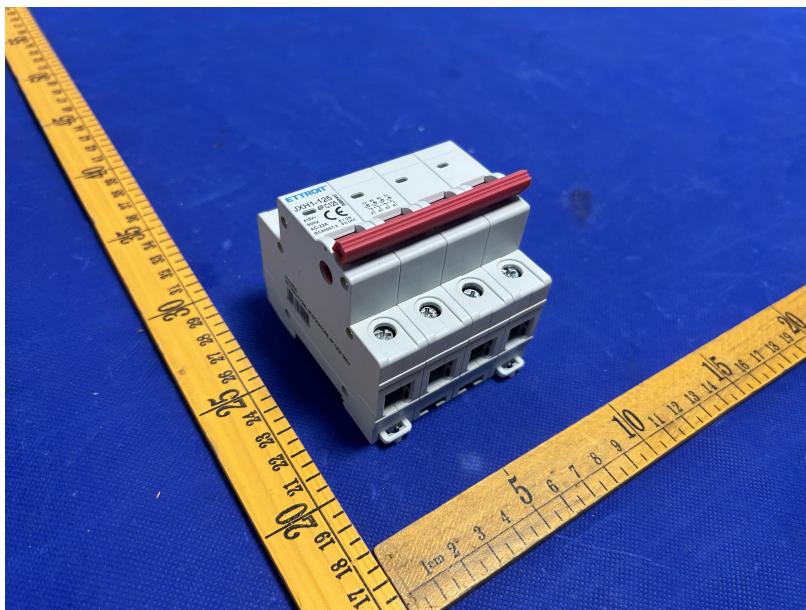


Photo 12

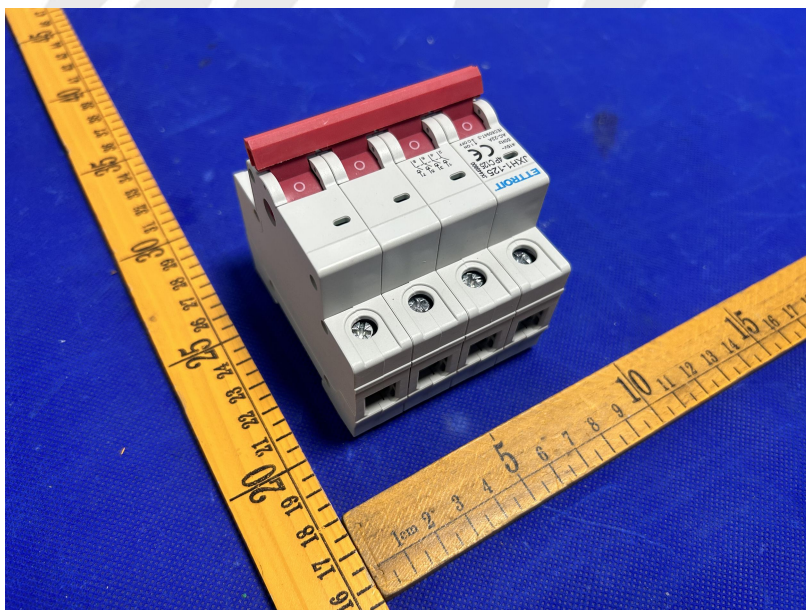


Photo 13

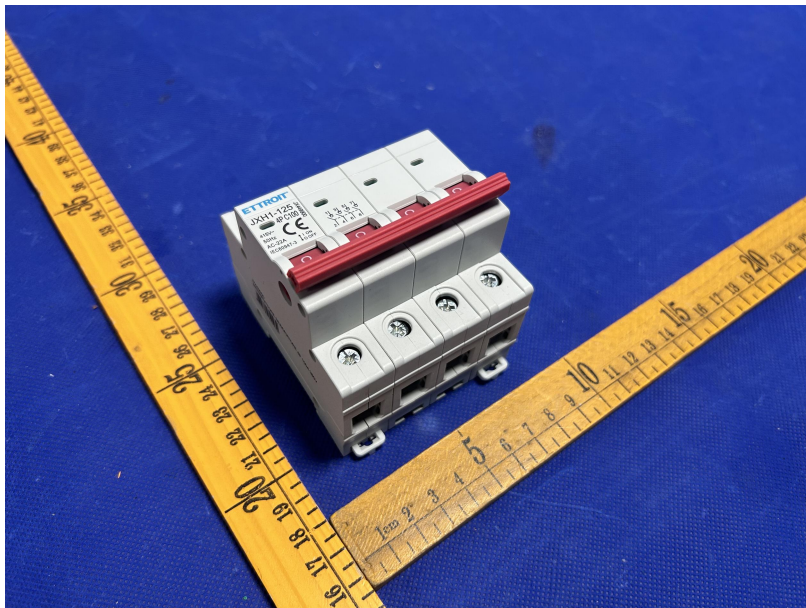


Photo 14



===== End of Report=====

