Technical Construction File

EN 61009-1:2012+A13:2021

Residual Current operated Circuit Breaker with over current protection for household and similar uses (RCBOs) - Part 1: General rules

Report reference No.:	TLZJ23122953924
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Date of issue:	January 02,2024
Reviewing laboratory:	Shanghai Global Testing Services Co., Ltd.
Reviewing location:	Floor 2nd, Building D-1, No. 128, Shenfu Road, Minhang District, Shanghai, China.
Applicant:	Zhejiang Changcheng Trading Co., Ltd.
Address:	DianHou Village, Liushi Town, Yueqing City, Zhejiang Province, China
Manufacturer:	CNC Electric Group Zhejiang Technology Co., Ltd.
Address:	DianHou Village, Liushi Town, Yueqing City, Zhejiang Province, China
Factory:	The same as manufacturer
Address:	The same as manufacturer
Standard:	☒ EN 61009-1:2012+A13:2021
Review Report Form No.:	61009-1
TRF originator:	GTS
Master TRF:	Reference No. EN 61009-1
Review procedure:	GTS
Type of Review object:	Leakage Circuit Breaker
Trademark:	/
Model/type reference:	YCB9L-40
Main Model:	YCB9L-40
Rating:	Ue=230,240V~,AC type,A type, (1P+N);6,10,16,20,25,32,40A;B,C,Inc=6000A, I△n:0.03,0.05,0.1,0.3A

Possible review case verdicts:

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

General remarks:

"(see remark #)" refers to a remark 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.

The review results presented in this report relate only to the object reviewed.

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Testing:	
Date of receipt of review item:	December 29,2023
Date(s) of performance of review:	December 29,2023 to January 02,2024

General product information:

Leakage Circuit Breaker

Summary of reviewing:

This review report includes:

Annex I: **3** page(s) of photo documentation.

Copy of marking plate

Residual Leakage Circuit Breaker, Model YCB9L-40 CNC Electric Group Zhejiang Technology Co., Ltd.	CE

4	Classification		---
	RCBOs are classified in the following		---
4.1	According to the method of operation		---
4.1.1	RCBO functionally independent of line voltage		P
4.1.2	RCBO functionally dependent on line voltage		P
4.2	According to the type of installation		P
4.3	According to the number of poles and current paths		P
4.4	According to the possibility of adjusting the residual operating current		P
4.5	According to resistance to unwanted tripping due to voltage surges		P
	RCBOs with normal resistance to unwanted tripping		P
	RCBOs with increased resistance to unwanted tripping		N/A
4.6	According to behaviour in presence of d.c. components		P
4.7	According to time-delay (in presence of a residual current)		P
4.8	According to the protection against external influences		P
4.9	According to the method of mounting		P
4.10	According to the methods of connection		P
4.11	According to the instantaneous tripping current		P
4.13	According to the I^2t characteristic		P
4.13	According to the type of terminals		P
4.Z1	According to the range of ambient air temperature		P
5	Characteristics of RCBOs		P
5.1	Summary of characteristics		---
	The characteristics of an RCBO shall be stated in the following terms:		---
	number of poles and current paths		P
	rated current In		P
	rated residual operating current $I_{\Delta n}$		P
	rated residual non-operating current $I_{\Delta no}$		N/A
	rated voltage Un		P
	rated frequency		P
	rated short-circuit capacity Icn		P
	rated residual making and breaking capacity $I_{\Delta}m$		N/A
	time-delay, if applicable	t⩽0.1s	P
	operating characteristics in case of residual currents with d.c. components		N/A
	method of mounting		P
	method of connection	From top	P
	range of instantaneous tripping overcurrent		P

	I^2t classification		P
	degree of protection		P
	ranges of ambient air temperature		P
	For RCBOs functionally dependent on line voltage		---
	behaviour of the RCBO in case of failure of line voltage		N/A
5.2	Rated quantities and other characteristics		P
5.2.1	Rated voltage		P
5.2.1.1	Rated operational voltage (Ue)		P
	The rated operational voltage (hereafter referred to as "rated voltage") of an RCBO is the value of voltage, assigned by the manufacturer, to which its performance is referred		P
5.2.1.2	Rated insulation voltage (Ui)		P
	The rated insulation voltage of an RCBO is the value of voltage, assigned by the manufacturer, to which dielectric test voltages and creepage distances are referred		P
	Unless otherwise stated, the rated insulation voltage is the value of the maximum rated voltage of the RCBO.		P
	In no case shall the maximum rated voltage exceed the rated insulation voltage		N/A
5.2.1.3	Rated impulse withstand voltage (Uimp)		P
	The rated impulse withstand voltage of an RCBO shall be equal to or higher than the standard values of rated impulse withstand voltage given in		P
5.2.2	Rated current (In)		P
	A current assigned by the manufacturer as the current which the RCBO can carry in uninterrupted duty (see 3.7.9), at a specified reference ambient air temperature.		P
	The standard reference ambient air temperature is 30 °C.	-30°C~+70°C	P
	If a different reference ambient air temperature for the RCBO is used, the effect on the overload protection of cables shall be taken into account, since this is also based on a reference ambient air temperature of 30 °C, according to installation rules		N
5.2.3	Rated residual operating current ($I_{\Delta n}$)		P
	The value of residual operating current (see 3.2.4), assigned to the RCBO by the manufacturer, at which the RCBO shall operate under specified conditions		P
5.2.4	Rated residual non-operating current ($I_{\Delta n}$no)		P

	The value of residual non-operating current (3.2.5), assigned to the RCBO by the manufacturer, at which the RCBO does not operate under specified conditions.		P
5.2.5	Rated frequency	50/60Hz	P
	The rated frequency of an RCBO is the power frequency for which the RCBO is designed and to which the values of the other characteristics correspond		P
5.2.6	Rated short-circuit capacity (Icn)		P
	The rated short-circuit capacity of an RCBO is the value of the ultimate short-circuit breaking capacity (see 3.4.6.1) assigned to that RCBO by the manufacturer		P
5..2.7	Rated residual making and breaking capacity ($I_{\Delta}m$)		P
	The r.m.s. value of the a.c. component of residual prospective current (3.2.3 and 3.4.3), assigned by the manufacturer, which an RCBO can make, carry and break under specified conditions		P
5.2.8	RCBO type S		P
	A time-delay RCBO (see 3.3.12) which complies with the relevant part of Table 2 and Table 3 if applicable		P
5.2.9	Operating characteristics in case of residual currents with d.c. components		P
5.3	Standard and preferred values		P
5.3.1	Standard values of rated voltage (*U*n)		P
5.3.2	Preferred values of rated current (In)		P
5.3.3	Standard values of rated residual operating current ($I_{\Delta}n$)		P
5.3.4	Standard value of residual non-operating current ($I_{\Delta}no$)		P
	The standard value of residual non-operating current is 0,5 $I_{\Delta}n$		
5.3.5	Value of rated frequency		P
5.3.6	Values of rated short-circuit capacity (*I*cn) and of rated residual making and breaking capacity (*I*Δm)		P
5.3.7	Void		N/A
5.3.8	Limiting values of break time and non-actuating time for RCBO of type AC and A		P
5.3.8.1	Limiting values of break time and non-actuating time for alternating residual currents (r.m.s. values) for type AC and A		P
5.3.8.2	Maximum values of break time for half-wave residual currents (r.m.s. values) for type A		P
5.3.9	Standard ranges of overcurrent instantaneous tripping		P

5.3.10	Standard values of rated impulse withstand voltage (Uimp)		P
5.3.Z1	Standard ranges of ambient air temperature		P
6	Marking and other product information		---
6.1Z1	Standard marking		---
	Each RCBO shall be marked in a durable manner according to the following Table Z3		P
	For RCBOs other than those operated by means of push-button, the open position shall be indicated by the symbol "O" and the closed position by the symbol "|" (a short straight line).		P
	Additional national symbols are allowed for this indication. Provisionally the use of national indications only is allowed. These indications shall be readily visible when the RCBO is installed		P
	For RCBOs operated by means of two push-buttons, the push-button designed for the opening operation only shall be RED and/or be marked with the symbol "O".		P
	RED shall not be used for any other push-button of the RCBO		P
	If a push-button is used for closing the contacts and is evidently identified as such, its depressed position is sufficient to indicate the closed position		P
	If a single push-button is used for closing and opening the contacts and is identified as such, the button remaining in its depressed position is sufficient to indicate the closed position. On the other hand, if the button does not remain depressed, an additional means indicating the position of the contacts shall be provided		N/A
	If it is necessary to distinguish between the supply and the load terminals, they shall be clearly marked (e.g. by "line" and "load" placed near the corresponding terminals or by arrows indicating the direction of power flow		N/A
	Terminals exclusively intended for the connection of the neutral circuit		P
	Terminals intended for the protective conductor, if any, shall be indicated by the symbol ⏚		P

	NOTE The symbol ⏚ (IEC 60417-5017 a)), previously recommended, shall be progressively superseded by the preferred symbol IEC 60417-5019 a), given above		N/A
	If a degree of protection higher than IP20 is marked on the device, it shall comply with it, whichever the method of installation.		N/A
	If the higher degree of protection is obtained only by a specific method of installation and/or with the use of specific accessories (e.g. terminal covers, enclosures, etc.), this shall be specified in the manufacturer's literature		N/A
	The base for plug-in RCBOs shall be marked with the following		---
	rated current or maximum rated current		P
	Trade mark		P
6.Z2	Additional marking		P
	Additional marking to other standards (EN or IEC or other) or additional requirements are allowed under the following conditions		---
	the RCBO shall comply with all the requirements of the additional standard		P
	the relevant standard to which the additional marking refers shall be indicated adjacent to this marking and shall be clearly differentiated or separated from the standard marking according to 6.Z1		P
	Compliance is checked by inspection and by carrying out all the test sequences required by the relevant standard. Equivalent or less severe test sequences need not be repeated.		P
7	Standard conditions for operation in service and for installation		P
7.1	Standard conditions		P
7.2	Conditions of installation		P
	RCBOs shall be installed in accordance with the manufacturer's instructions		P
7.3	Pollution degree		P
	RCBOs complying with this standard are intended for environment with pollution degree 2, i.e. normally, only non-conductive pollution occurs; occasionally, however, a temporary conductivity caused by condensation may be expected		P
8	Requirements for construction and operation		P

8.1	Mechanical design		P
8.1.1	General		P
	RCBOs shall be designed and constructed so that, in normal use, their use is safe and without danger to the user or to the environment		P
	The residual current detection and the residual current release shall be located between the incoming and outgoing terminals of the RCBO		P
	It shall not be possible to alter the operating characteristics of the RCBO by means of external interventions		P
	Changing from one setting to another shall not be possible without a tool. It shall not be possible to disable or inhibit the RCBO function by any means		P
	In case of an RCBO having multiple settings of residual operating current, the rating refers to the highest setting.		P
8.1.2	Mechanism		P
	The moving contacts of all poles of multipole RCBOs shall be mechanically coupled so that all poles, except the switched neutral, if any, make and break substantially together, whether operated manually or automaticall		P
	The switched neutral pole (see 3.3.15.3) of four-pole RCBOs shall not close after and shall not open before the other poles		P
	If a pole having an appropriate short-circuit making and breaking capacity is used as a neutral pole and the RCBO has an independent manual operation (see 3.7.5), then all poles, including the neutral pole, may operate substantially together		P
	RCBOs shall have a trip-free mechanism		P
	It shall be possible to switch the RCBO on and off by hand. For plug-in RCBOs without an operating handle, this requirement is not considered to be met by the fact that the RCBO can be removed from its base		P
	RCBOs shall be so constructed that the moving contacts can come to rest only in the closed position (see 3.3.13) or in the open position (see 3.3.14), even when the operating means is released in an intermediate position		P

	RCBOs shall provide in the open position (see 3.3.14) an isolation distance in accordance with the requirements necessary to satisfy the isolating function		P
	Indication of the position of the main contacts shall be provided by one or both of the following means:		---
	the position of the actuator (this being preferred)		P
	separate mechanical indicator		P
	If a separate mechanical indicator is used to indicate the position of the main contacts, this shall show the colour red for the closed position and the colour green for the open position		N/A
	The means of indication of the contact position shall be reliable	reliable	P
	Compliance is checked by inspection and by the tests of 9.9.2.2.		P
	RCBOs shall be designed so that the actuator, front plate or cover can only be correctly fitted in a manner which ensures correct indication of the contact position		P
	Compliance is checked by inspection and by the tests of 9.12.12.1 and 9.12.12.2		P
	When means are provided or specified by the manufacturer to lock the operating means in the open position, locking in that position shall only be possible when the main contacts are in the open position		P
	Where the operating means is used to indicate the position of the contacts, the operating means, when released, shall automatically take up the position corresponding to that of the moving contacts; in this case, the operating means shall have two distinct rest positions corresponding to the position of the contacts but, for automatic opening, a third distinct position of the operating means may be provided, in which case it shall be necessary to reset the RCBO manually before reclosing is possible		P
	When an indicator light is used, this shall be lit when the RCBO is in the closed position and be of bright colour. The indicator light shall not be the only means to indicate the closed position		P
	The action of the mechanism shall not be influenced by the position of enclosures or covers and shall be independent of any removable part		P
	A cover sealed in position by the manufacturer is considered to be a non-removable part		P

	If the cover is used as a guiding means for push-buttons, it shall not be possible to remove the buttons from the outside of the RCBO		N
	Operating means shall be securely fixed on their shafts and it shall not be possible to remove them without the aid of a tool		P
	Operating means directly fixed to covers are allowed. If the operating means has an "up-down" movement, when the RCBO is mounted as in normal use, the contacts shall be closed by the up movement		P
	Compliance with the above requirements is checked by inspection, by manual test and, for the trip-free mechanism, by the test of 9.11.		P
8.1.3	Clearances and creepage distances		P
	Between live parts which are separated when the main contacts are in the open positiona		N/A
	Between live parts of different polarityaj		
	Between circuits supplied from different sources, one of which being PELV or SELVg		
8.1.4	Screws, current-carrying parts and connections		P
8.1.5	Terminals for external conductors		P
8.1Z1	Mechanical mounting of plug-in type RCBOs		P
8.2	Protection against electric shock		P
8.3	Dielectric properties and isolating capability		P
	RCBOs shall have adequate dielectric properties and shall ensure isolation		P
	Control circuits connected to the main circuit shall not be damaged by high d.c. voltage due to insulation measurements which are normally carried out after RCBOs are installed		P
8.4	Temperature-rise		P
8.5	Operating characteristics		P
8.6	Mechanical and electrical endurance		P
	RCBOs shall be capable of performing an adequate number of mechanical and electrical operations.		P
	Compliance is checked by the test of 9.10		P
8.7	Performance at short-circuit currents RCBOs shall be capable of performing a specified number of short-circuit operations during which they shall neither endanger the operator nor initiate a flashover between live conductive parts or between live conductive parts and earth		P

8.8	Resistance to mechanical shock and impact RCBOs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
8.9	Resistance to heat RCBOs shall be sufficiently resistant to heat		P
8.10	Resistance to abnormal heat and to fire		P
	External parts of RCBOs made of insulating material shall not be liable to ignite and to spread fire if current-carrying parts in their vicinity, under fault or overload conditions, attain a high temperature. The resistance to abnormal heat and to fire of the other parts made of insulating material is considered as checked by the other tests of this standard		P
8.11	Test device		P
8.12	Requirements for RCBOs functionally dependent on line voltage		P
8.13	VIOD		N/A
8.14	Behaviour of RCBOs in case of current surges caused by impulse voltages		P
8.15	Behaviour of RCBOs in case of earth fault currents comprising a d.c. component		P
8.16	Reliability		P
8.17	EMC		N/A
9	Tests		P

--- End of Report ---

Type of equipment: Leakage Circuit Breaker

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View:

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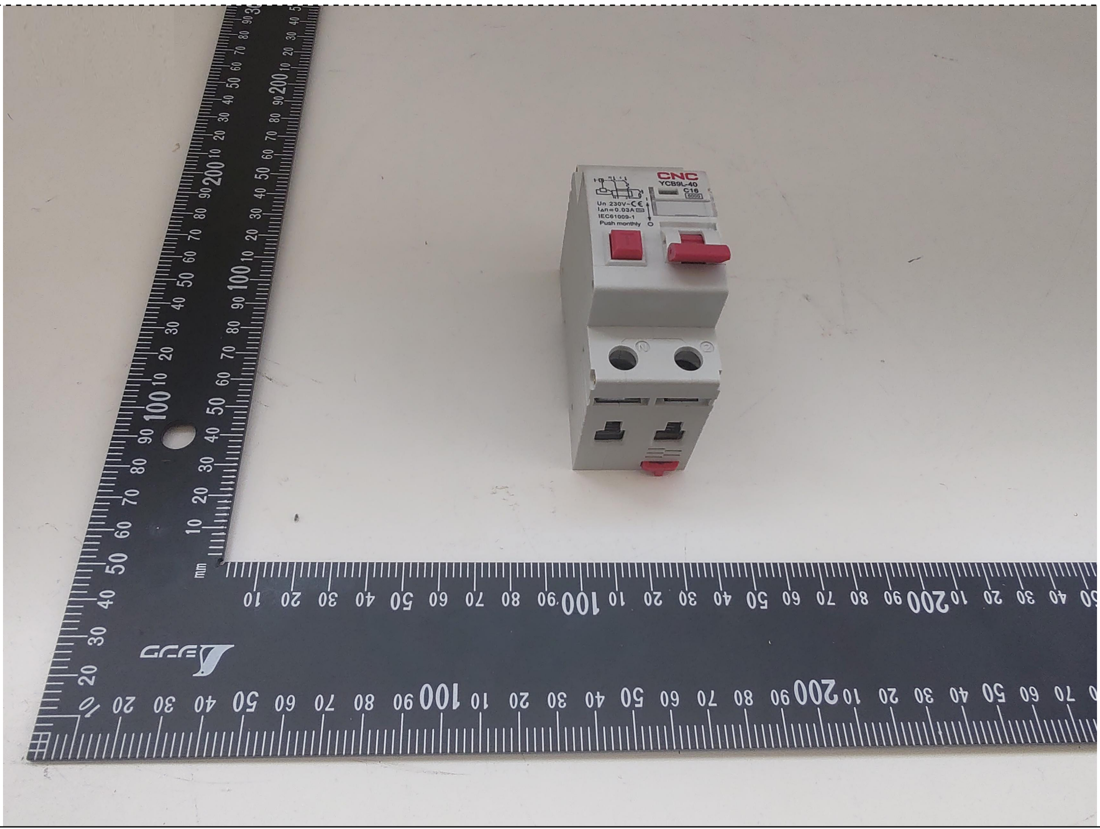

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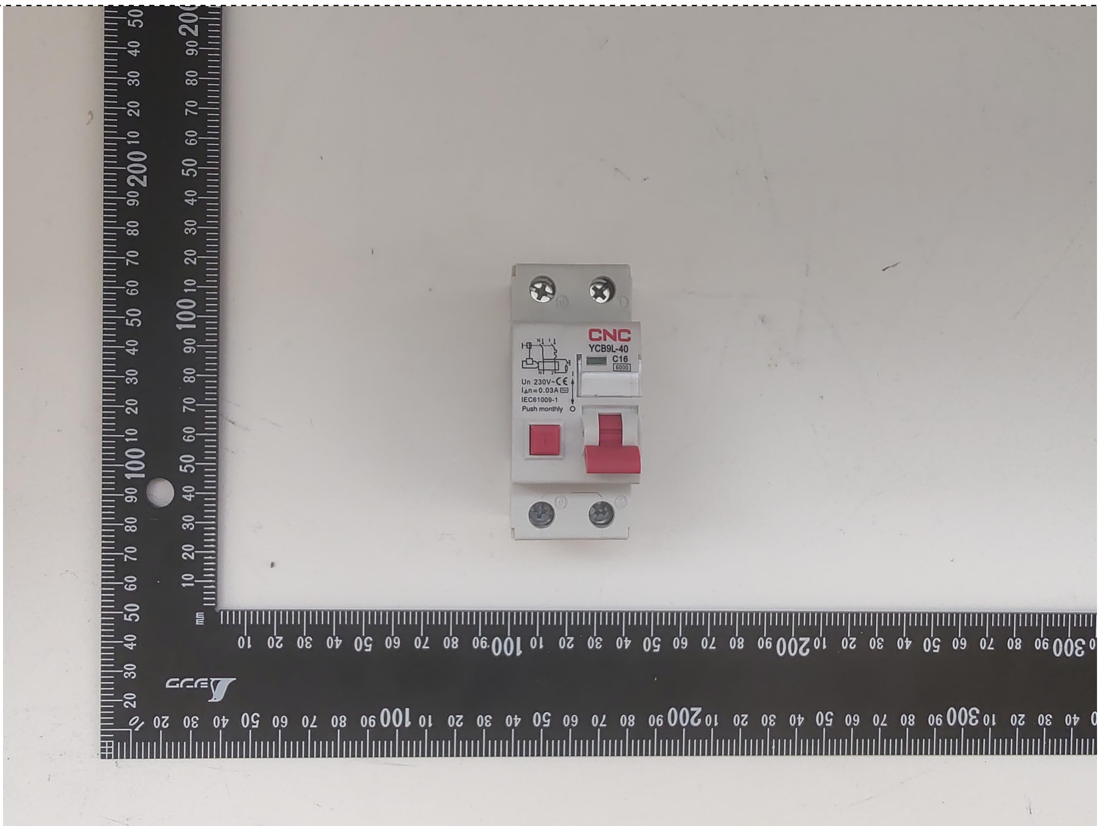

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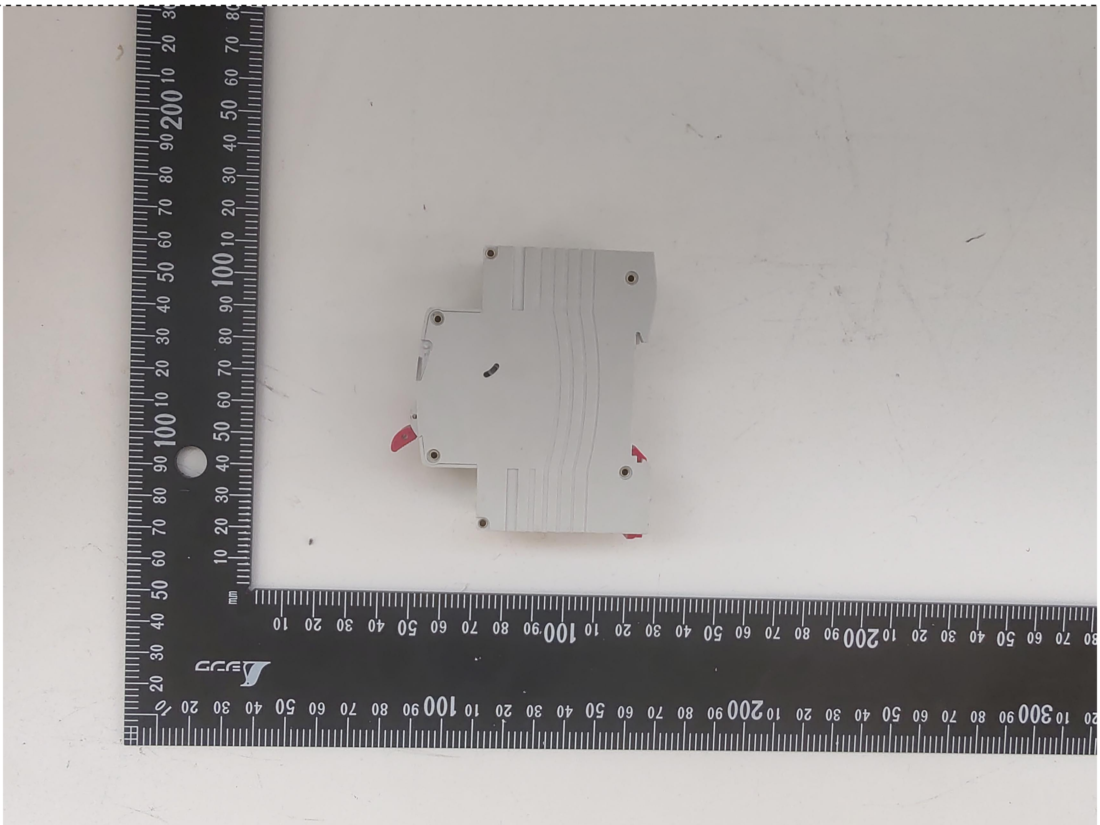

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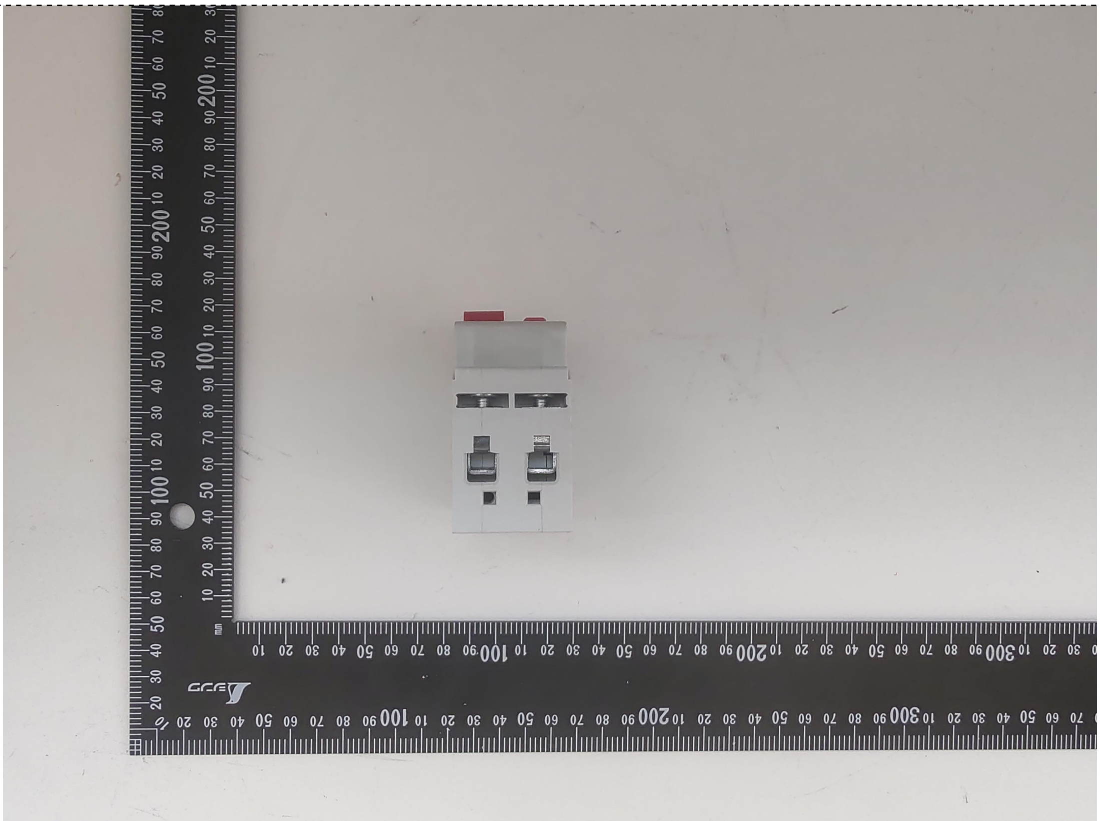

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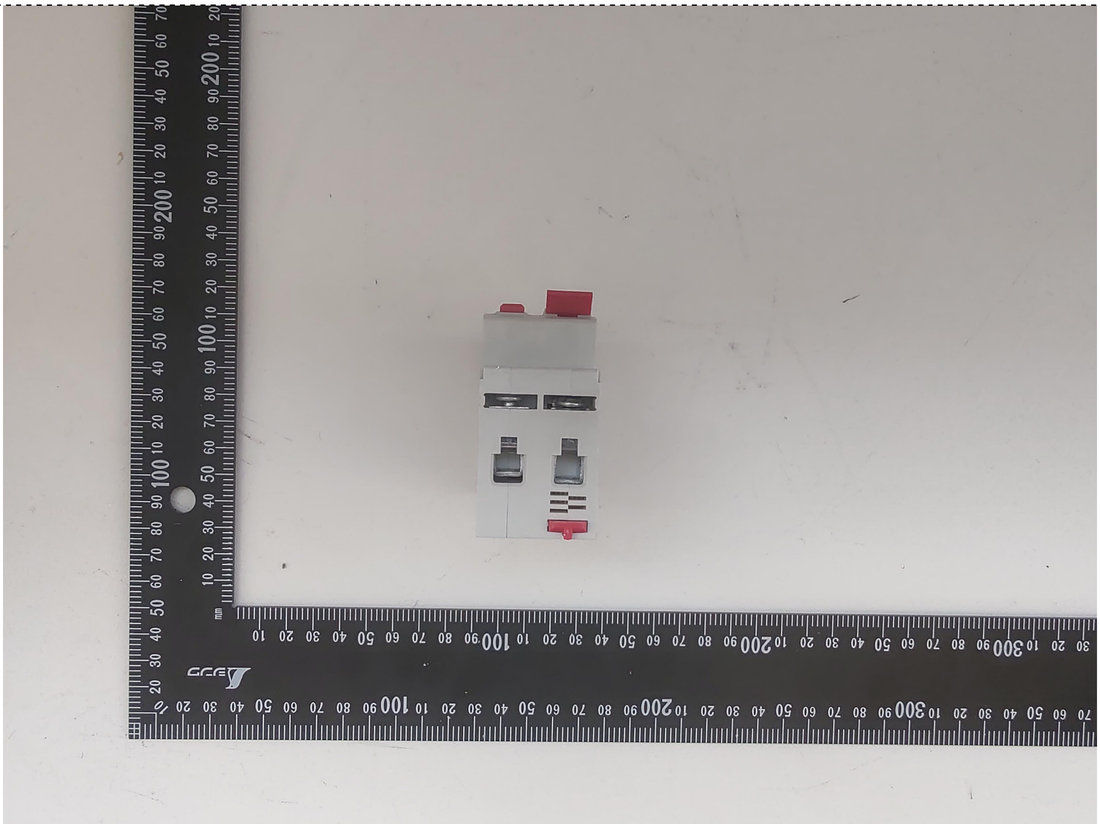

- End of Annex I -