



DZ47PLE
Residual Current Operated Circuit-Breaker

NAVIGATOR
Series

User Manual



Please carefully read this User Manual before installing and operating the product, and keep this manual properly for future reference

Safety Notice

Please carefully read this instruction before the installation, operation, run, maintenance, and inspection, and follow the contents of the instruction to properly install and operate this product.



Danger:

- Do not operate the circuit breaker with your wet hands;
- Do not touch the energized parts during operation;
- Mark sure that the product is de-energized during the maintenance and service;
- Do not use the short circuit method for product testing;

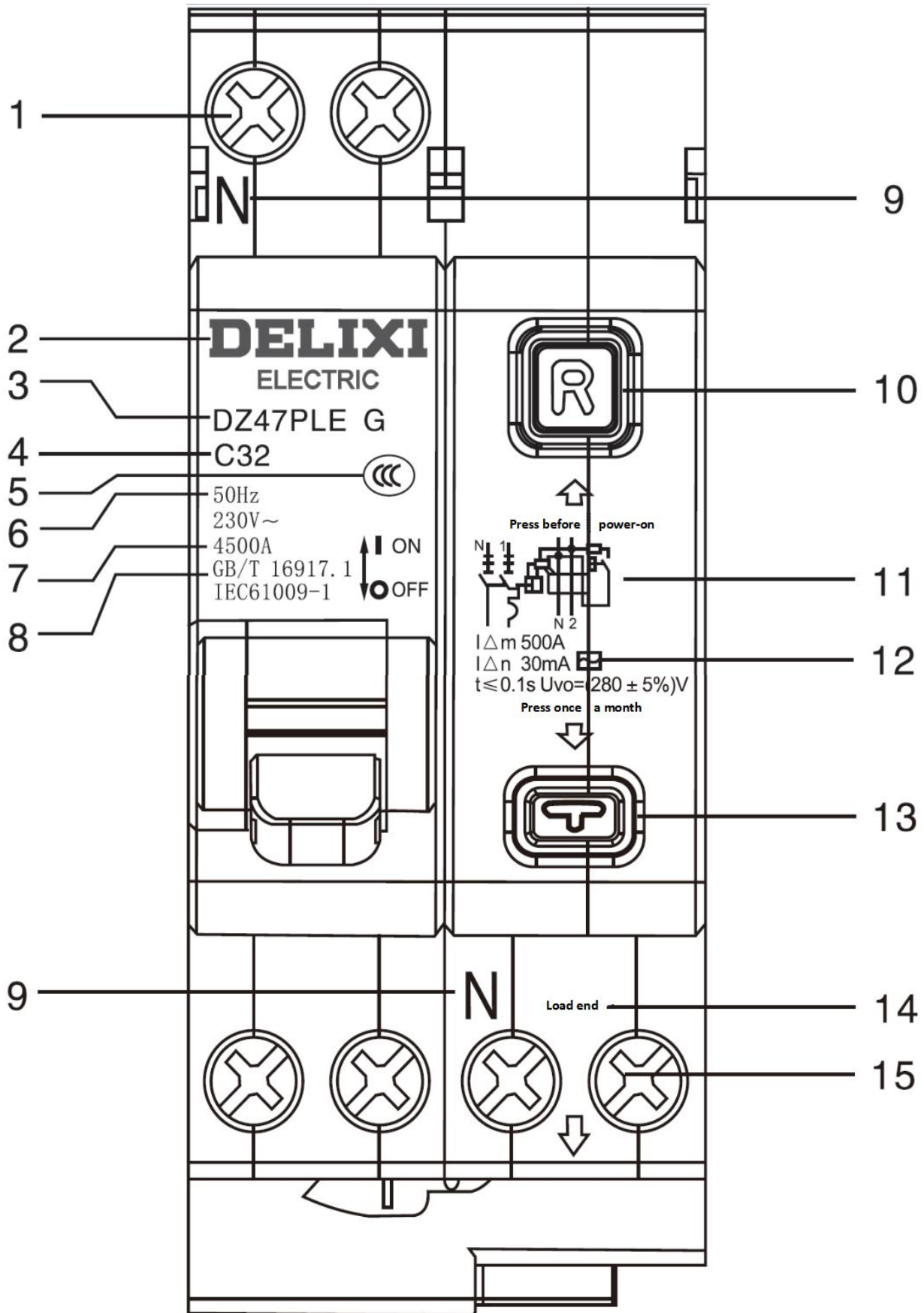


Caution:

- The installation, maintenance and service shall be performed by the qualified professional;
- Various characteristics of product have been set in factory and cannot be removed or adjusted without permission during operation;
- Please confirm that the rated voltage, rated current, frequency and characteristics of the product meet the operating requirements before use;
- When wiring, the wire is led in from the top, and is led out from the bottom; and tighten the wiring screws when the wire inserts into the connecting hole. The wire tightening torque is 1.5N.m to prevent the wire from looseness or being pulled out. The exposed copper wire cannot be out of the wiring terminal;
- This product cannot provide the protection for electric shock hazard caused by simultaneously contacting the phase wire and neutral wire of the protected circuit; it cannot provide the protection for electric shock hazard caused by contacting the phase wire of the protected circuit after the neutral wire before the incoming line terminal loses phase;
- With the protection grade IP20, this product has not dust-proof function; when used in a dusty place, this product shall be installed in a well closed terminal box;
- If found damage or abnormal sound when unpacking, please stop the operation immediately and contact the supplier;
- After the breaking, for the leakage protection, overload protection or short circuit protection, please eliminate the fault and then power on this product, otherwise this may affect the service life of the product.
- After the product is installed, do not use the insulation resistance megger tester to test the insulation resistance between the phase line and the neutral line of the line protected by the product ;
- This product shall be free from rain or water erosion or cannot be fallen off during the operation, storage or transport;
- This product is not suitable for some special applications such as frequent starts of motor, electric heating equipment, high capacity cabinet, high inductive or high capacitive loads, or high temperature environment;
- When scrapping the product, please dispose the product waste properly. Thanks for your cooperation.

About DZ47PLE Residual Current Operated Circuit Breaker

• Panel Introduction



Legends:

- | | | |
|---|---|-------------------------|
| 1 Inlet terminal | 2 Company Logo | |
| 3 Product model (G means with overvoltage protection) | | |
| 4 Trip curve and rated current (see Table 1) | | |
| 5 Certification mark | 6 Rated voltage and frequency (see Table 1) | |
| 7 Breaking capacity | 8 Reference standard | 9 N pole identification |
| 10 Reset button | 11 Wiring diagram | |
| 12 Rated residual making and breaking capacity, rated residual operated current, operating time ($U_{vo}=(280\pm5\%)V$ is the parameter with overvoltage protection) | | |
| 13 Test button | 14 Load end identification | 15 Outlet terminal |

Normal Operation, Installation and Transport Conditions**●Normal Operation and Installation Conditions****(1) Ambient air temperature**

The ambient air temperature is not higher than +60°C, and is not below -20°C, and the average value within 24 hours does not exceed +35°C;

Note: When the residual current operated circuit breaker is used in a place where the ambient air temperature is higher than +60°C and below -20°C, please contact the manufacturer.

(2) Altitude

The altitude of the installation site does not exceed 2000m;

(3) Atmospheric conditions

The relative humidity of the atmosphere does not exceed 50% when the highest ambient temperature is +60°C, and a higher relative humidity is allowed at lower temperatures, such as 90% at 20°C. Protective measures shall be taken for condensation occasionally occurred due to temperature changes.

(4) Installation conditions

The external magnetic field nearby the residual current operated circuit breaker installation site shall not exceed 5 times earth magnetic field in any direction;

The installation position shall be vertical, and the inclination angle at each direction shall not exceed 10°; installed at a place where there is no impact, vibration, and rain or snow erosion;

TH35-7.5 steel mounting rail is used for installation.

(5) Pollution level: Level 2;**(6) Installation category: Class III;****(7) Protection grade: IP20 (IP40 if installed in a power distribution box, a power distribution cabinet or tank).****● Normal Storage and Transport Conditions****(1) Temperature: -40oC~+70oC;****(2) Relative humidity (at 25°C): ≤95%;****(3) During the transport, please handle the product gently, and do not upside it down, and prevent the product from harsh collision.**

Main Specifications and Technical Parameters

Main technical parameters are listed in Table 1

Table 1 Main technical parameters

Model	Rated current I_n A	Freq. Hz	Rated voltage U_e V	Rated short circuit breaking capacity I_{cn} A	Rated residual operating current $I_{\Delta n}$ mA	Rated residual non- operating current $I_{\Delta no}$ mA	Breaking time at $I_{\Delta n}$ s	Rated residual making and breaking capacity $I_{\Delta m}$ A	Release type
DZ47LE	6 10 16 20 25 32 40	50	230	4500	30	15	<0.1	500	C, D

The protection characteristics of the overcurrent release are listed in Table 2

Table 2 Protection characteristics of the overcurrent release

Type of overcurrent instantaneous release	Rated current In A	Test current A	Start state	Test time	Expected result	Remarks	Reference temperature
C, D	≤40	1.13In	Cold state	t≤1h	Not-trip	--	+30 ⁺⁵ ₀ ℃
C, D		1.45In	Followed by test	t<1h	Trip	The current rises to the specified value within 5s	
C, D		2.55In	Cold state	1s<t<60s (for In≤32A)	Trip	--	
				1s<t<120s (for In>32A)			
C, D		5In/10In	Cold state	t≤0.1s	Not-trip	Turn on the auxiliary switch to supply power	
C, D		10In/14In	Cold state	t<0.1s	Trip	Turn on the auxiliary switch to supply power	

Structure Features and Working Principle

This residual current operated circuit breaker primarily consists of zero sequence current transformer, electronic component board, release, contact operating mechanism, and plastic shell.

The working principle is shown in Fig. 1. In case of electric leakage or personal electric shock in circuits, when the residual operating current reaches the set value of the operating current, a signal will be generated from the secondary coil of the zero sequence current transformer (induced voltage) to open the residual current operated circuit breaker after amplification by the electronic line, thereby cutting off the power supply for electric leakage protection.

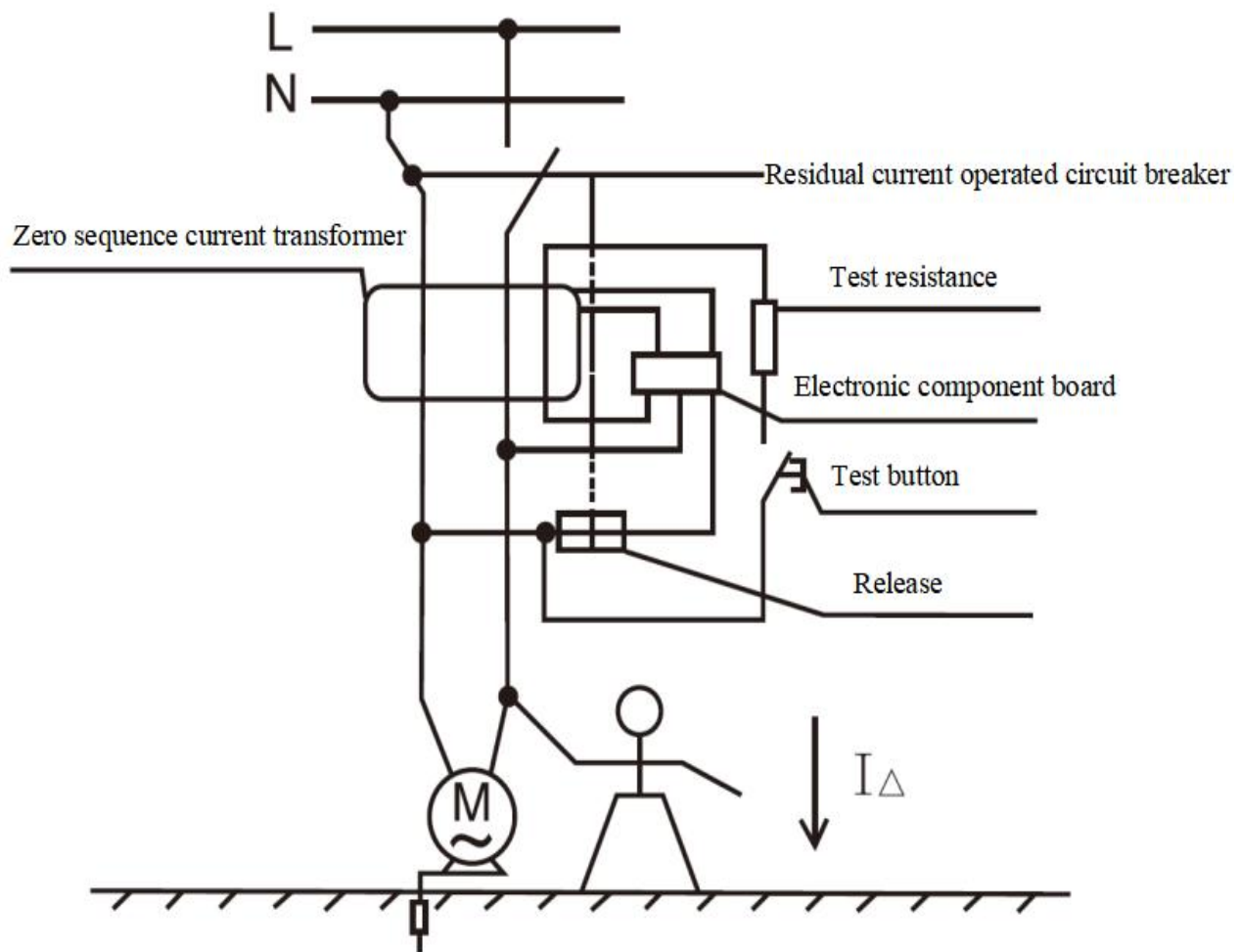


Fig. 1 Working schematic diagram of this residual current operated circuit breaker

Outline and Installation Dimensions

The outline and installation dimensions of DZ47PLE are shown in Fig. 2.

Unit: mm

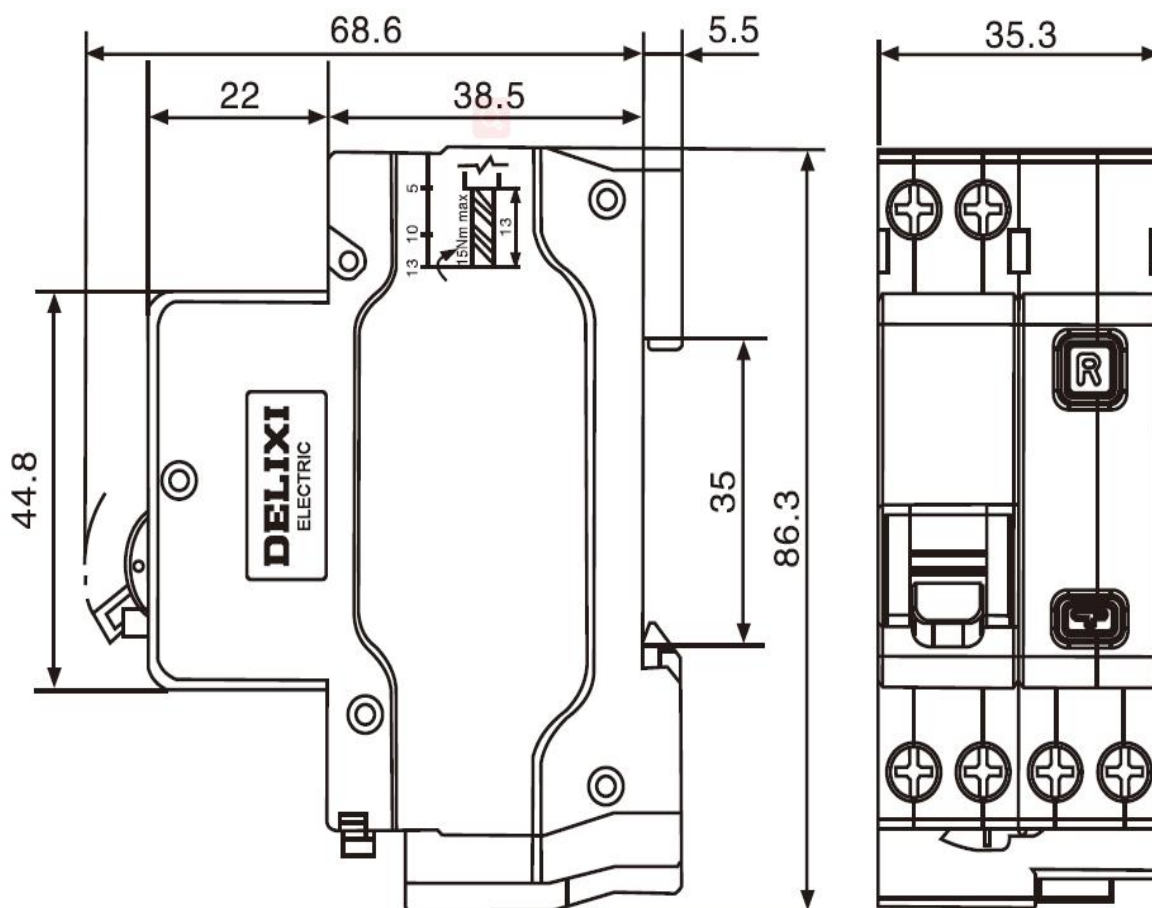


Fig. 2

• Installation and Operation

- (1) Before installation, check whether the product marks is consistent with the working conditions.
- (2) Press the Reset button before power-on.
- (3) Before power-on, operate the residual current operated circuit breaker several times and check that its mechanism works flexibly and reliably without blockage.
- (4) The inlet end shall be connected to the power supply, and the load end shall be connected to the load.
- (5) The cross-sectional areas of the connecting wire are listed in Table 3.

Table 3 Sectional area of the connecting wire and the rated current

Rated current A	6	10	16, 20	25	32	40
Sectional area of wire mm ²	1	1.5	2.5	4	6	10

- (6) After power-on, operate the test button of the residual current operated circuit breaker to confirm whether it can work reliably.
- (7) When the handle moves upwards, the indicator window displays red, indicating that the circuit is connected; when the handle moves downward, the indicator window displays green, indicating that the circuit is disconnected.
- (8) When installation, insert the residual current operated circuit breaker into the mounting rail to fix the residual current operated circuit breaker on this rail without looseness or falling off. To remove the residual current operated circuit breaker, pull the stop block downward for removal.
- (9) The working reference temperature of the residual current operated circuit breaker is $+30\pm 5\text{ }^{\circ}\text{C}$. When the ambient temperature changes, its rating shall be corrected. The temperature correction coefficients are listed in Table 4; if multiple residual current operated circuit breakers are all installed in a closed box, the temperature inside the box will rise, so that the rated current shall multiply by the derating coefficient 0.8.

Table 4 Rated current and temperature correction coefficient table

Temperature (°C) Rated current (A)	-20	-10	0	10	20	30	40	50	60
6	7.35	7.10	6.84	6.57	6.29	6.00	5.69	5.37	5.02
10	13.09	12.54	11.95	11.34	10.69	10.00	9.26	8.45	7.56
16	19.77	19.07	18.35	17.60	16.82	16.00	15.13	14.22	13.23
20	24.49	23.66	22.80	21.91	20.98	20.00	18.97	17.89	16.73
25	30.72	29.67	28.57	27.43	26.24	25.00	23.69	22.30	20.82
32	39.19	37.86	36.49	35.05	33.56	32.00	30.36	28.62	26.77
40	49.24	47.54	45.77	43.93	42.01	40.00	37.88	35.64	33.24

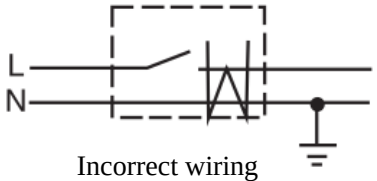
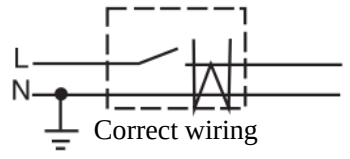
● **Maintenance**

After the residual current operated circuit breaker is running for some time, please check it regularly (monthly). In the power-on state, press the test button and check whether the residual current operated circuit breaker can work reliably. If failed to work normally, please stop the operation and replace it immediately.

Fault Analysis and Troubleshooting

The fault analysis and troubleshooting of the residual current operated circuit breaker see Table 5.

Table 5 Fault Analysis and Troubleshooting

Fault		Cause	Solution
Misoperation	Misoperation caused by the grounding of the zero line at the load side of the residual current operated circuit breaker	The zero line at the load side of the residual current operated circuit breaker is grounded, which may cause misoperation when the normal operating current passes through the grounded point Residual current operated circuit breaker  Incorrect wiring	Connect the ground wire to the zero line of the power side of the residual current operated circuit breaker Residual current operated circuit breaker  Correct wiring
	Misoperation caused by the leakage current and wire capacitance current	The length of the wire laying against the ground at the load side is too long	The residual current operated circuit breaker with a larger residual operating current is selected
		Earth leakage current of the wire at the load side increases due to the reduction of the insulation	Replace the wire
Failure to operate	Failure to operation is caused by not connecting the zero line of the residual current operated circuit breaker	Only the phase line of the residual current operated circuit breaker is connected, but the zero line is not connected	Connect the zero line at the power side

Unpacking Inspection

After unpacking, please check whether the product is intact, whether the exposed metal is rusty, and whether the product is defected due to poor transport or storage. If found the above phenomenon, please stop the product, and contact the supplier timely for solution.

Company Commitment

Under the condition that users follow the use and storage conditions and the product are well sealed, within 36 months from the production date, our company will provide repair and replacement service free of charge for any damage or abnormal operation due to poor manufacture quality. A paid repair will be provided if the warranty period expires. For any damage due to one of the following situations, a paid repair will be given even if within the warranty period:

- (1) Improper operation, maintenance, or storage;
- (2) Modified and improper repair without permission;
- (3) Damage due to falling off or found during installation after purchase;
- (4) Force majeure such as earthquakes, fires, lightning strikes, abnormal voltages, and secondary disasters; If you have any question, please contact the dealer or our company's customer service department.

Order Notice

Please specify the following items when ordering:

- 1) Name, model and specification of the residual current operated circuit breaker;
- 2) Rated current of the residual current operated circuit breaker;
- 3) Residual operating current of the residual current operated circuit breaker;
- 4) Qty.

Example 1: To order DZ47PLE, electronic type, C type, rated current 16A, rated residual operating current 30mA, 100 units.

Please specify: To order DZ47PLE C16 30mA 100 units.



Certificate

DELIXI ELECTRIC LTD

Name: Residual Current Operated Circuit-Breaker

Model: DZ47PLE

This product passes the inspection and is allowed to be shipped.

Standard: GB/T 16917.1

Inspector: Check 03

Production date: See label on inner box

www.cn-delixi.com

The first edition of this manual was issued on May, 2018.