RW ENERGY

PRODUCT MANUAL http://www.rw-relay.com

RWB

RWB series Microcomputer protection device

Local Feeder Automation
Functions of relay protection
Control functions
Monitoring Functions

Comply with IEC / CEI /GB/JB/DL standards
Provided customized manufacture
Whole solutions for design, assembly, test...
Accountable solution for safety and reliability
Wide range offering, easy business and convenient installation

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Zhejiang Rockwill Energy Technology Co., Ltd. is a technology enterprise specializing in providing complete solutions for power automation system and related automation system supporting equipment.

The company has a long-term strategic cooperation with internationally renowned middle and high voltage electrical equipment R & D and manufacturing companies and research institutes, and has jointly developed a series of high-quality automation products,. The company has also married with the provincial intelligent high-voltage switch laboratory to jointly develop a new generation of intelligent synchronous switch measurement and control devices, electronic transformers, voltage sensor processing units, etc., and has achieved some fruitful technical achievements and accumulated a large number of industry professional and technical elites with excellent experience.Solid talent base, advanced production equipment, perfect quality system, strict testing means, is a strong guarantee for the company's product quality alone.

In addition to providing a rich choice of products, we can provide you with technical solution support services, you only need to tell us your needs, our technical staff will be tailored for you to design a complete set of product solutions

The company is renowned at home and abroad for providing high-quality products and services. In addition to the domestic market, the products are currently exported to South America, Central Asia, the Middle East, Central Europe, Southeast Asia, Africa and other places.We always adhere to the belief of growing together with customers, and strive to provide safer, more reliable, more advanced and more humane automation system solutions and equipment.

RW ENERGY®, China. Provide with best support. If you have any question please consult below:

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RW ENERGY® Electric strives to bring our customers the latest technology and competitive pricing and best service for distribution automatic.

The and RWB series digital microcompute protection devices are all suitable for small - current / small - resistance grounding systems with voltages of 35 kV and below .They integrate functions such as protection, control, communication, and monitoring.

These devices all adopt the modular (component - based) programmable design concept, which can reduce maintenance workload and spare parts, and flexibly meet various application requirements. They are ideal alternatives to traditional electromagnetic relay protection.

Microcomputer - based protection is widely used in power plants, substations, industrial enterprise power supply systems and distribution networks. In power plants, substations, industrial enterprises and distribution networks, protection device is used to protect equipment such as generators, components like busbars, high - and low - voltage systems and motors, as well as power lines and distribution transformers respectively.Its functions include fault protection, which quickly cuts off faulty equipment; abnormal operation protection, which deals with equipment abnormalities; improving power supply reliability by reducing power outage time and scope, and some devices are equipped with automatic reclosing functions; performing data monitoring and analysis . It also has communication and automation control functions, and works with other equipment to improve the operation and management level of the power system.

Service environment

Ambient temperature:	-25℃ ~ +70℃
Storing temperature:	-40℃ ~ +85℃
Ambient humidity:	5% ~ 95% (Non-congealing cream)
Rate of ambient temperature change:	<25℃/h
Altitude range:	-100~3000m

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Main Functions of relay protection:

Current Protection: All feature three - stage phase - current protection, which provides graded protection against phase - current faults of different degrees. Zero - sequence current protection is also present in all cases, including the regular type as well as the three - stage and two - stage low zero - sequence current protection detailed in subsequent texts. Negative - sequence current protection is utilized to detect system asymmetry, and the negative - sequence over - current function serves to prevent abnormal negative - sequence current from causing harm to equipment.

Special Protection: Inverse - time protection is available, adjusting the operating time according to the magnitude of the fault current.

Equipment Protection: There is an overload component to prevent equipment overloading, and over - heat protection to avoid equipment damage due to overheating.

System Stability: The reclosing function automatically restores power supply after the fault is cleared. Frequency protection stabilizes the system frequency. Undervoltage/overvoltage protection guards against voltage abnormalities, and zero - sequence phase over - voltage protection is designed to address abnormal zero - sequence phase voltage.

Motor Protection: All incorporate motor start fast - break (power - off) protection to prevent short - circuit faults during motor startup.

Communication functions:Using the RS485 interface of the device passing Modbus RTU Communication protocol link to SCADA system; realizable Events\Faults and Measurands viewing, executing remote command, Time synchronizing, Viewing and Changing Settings

Fault Recording Function:When the power system has fault or oscillation, the relevant electricity quantity in the power system is automatically recorded. Such as voltage, current and other changes with time process. This helps to analyze the type and location of the fault as well as the development process. It provides a key basis for fault diagnosis of power system and performance evaluation of protection devices.

Data Storage functions:Event Records, Fault Records, Measurands.

Three Tele - functions ： Remote signaling Remote measuring, Remote controlling function.

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The RWB series digital microcomputer protection devices are applicable to distribution systems with various voltage levels and different grounding methods. These devices adopt arc protection and support wireless temperature measurement for switch cabinets, conforming to IEC61850/IEC103/Modbus protocols. They can provide protection, control for feeders, capacitors, reactors, motors and transformers. In terms of software, the idea of component programmable design is adopted to reduce maintenance workload and spare parts. At the same time, it provides large-screen display, simple human-machine interface, operation box function, independent measuring CT, redundant star network communication mode, and convenient remote technical support services, ensuring the rigorous and flexible style of protection. It is a product with excellent cost-performance ratio.

In the name of professionalism, we will tailor exclusive customized solutions for you. With exquisite craftsmanship and rich experience, we will meet your every detailed requirement. If you need detailed customization, please feel free to contact our sales representatives at any time.

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The microcomputer - based protection device is a key equipment for the safe and stable operation of the power system, and its working process involves multiple closely linked steps.

In the data acquisition stage, real - time voltage and current signals are obtained from the power system circuit through the potential transformer (PT) and current transformer (CT). These transformers convert high voltage and large current into low - voltage and small - current signals suitable for processing in proportion. Subsequently, high - frequency noise is filtered out by a low - pass filter, and then the analog signals are converted into digital signals by an A/D converter. The magnitude and phase information of the voltage and current are presented in the form of discrete digital quantities for subsequent processing.

During the data processing and analysis phase, the microprocessor performs operations on the collected digital signals to obtain parameters related to the operating state of the power system, such as the effective value of current, voltage amplitude and phase, power, and frequency. Based on the protection principles and preset algorithms, these parameters are analyzed and judged. For example, in over - current protection, the calculated current value is compared with the action threshold, and in distance protection, the distance to the fault point is calculated and compared with the protection range to determine the operating state of the power system and the fault situation.

In the logical judgment stage, logical rules based on different protection functions and operating requirements are preset in the device. When the data analyzed by the microprocessor meets the startup conditions of a certain protection logic, the corresponding logic is triggered. For example, if the current exceeds the threshold and lasts for longer than the set delay time, it is judged as an over - current fault, and if the voltage is lower than the set value, the under - voltage protection is activated.

In terms of action execution, if the protection logic determines that the system has a fault or is in an abnormal state, the device will operate according to the preset strategy. The most common action is to issue a tripping command to control the circuit breaker to cut off the faulty equipment and prevent the fault from expanding. At the same time, it can also perform operations such as alarm and signal output to deal with abnormalities such as equipment overload.

Regarding communication and human - machine interaction, the device exchanges data with the monitoring center through the communication network, facilitating remote monitoring and management. It is also equipped with a human - machine interaction interface, which enables operators to view information, set parameters, and enable or disable protection functions, thus realizing the debugging and maintenance of the device.

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1) 50--Overcurrent component
2) 50N--Zero sequence overcurrent component
3) Acceleration protection components
4) 51--Inverse time component
5) 49--overload component
6) 79--reclosing component
7) 81L--Low-frequency trip component
8) 27--Low voltage component
9) 59--Over voltage component
10) 59N--Zero sequence overvoltage component
11) 27--No voltage component
12) 50M--Motor start fast break protection
13) 67Q--Negative sequence overcurrent protection component
14) 49--Overheat protection component
15) 51LR-- Locked-rotor component
16) 48--Long startup time protection component
17) Non-electrical protective component
18) 60VTS--PT break detection
19) 60CTS--CT break detection
20) 50BF--Contro1 loop break detection

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Model & version	Model	RWB-200
	Version	V4.12.0
	Type of operating mechanism	Spring mechanism type
Power	Rated working voltage	230V ±20%
	Rated frequency	50Hz
	Electric energy consumption	≤5W
Analog parameters	Current transform quantity	3 phase current + 1 earth current
	Rated current in	5A or 1A
	Voltage transform quantity	4 voltage transform
	Voltage transform Nominal	40…120 Vrms
Protection relay and measurement accuracy	Current protection（secondar side）	0.08~20A ≤±2.5%
	Zore-sequence current protection （secondar side）	0.05~20A ≤±2.5%
	Voltage	20~280V ≤±2.5%
Protection performance parameters	Event resolution	2ms
	Quick-break export time	Under the input of 1.2In magnification, the whole group action time is less than 40ms
	Protect export time error	≤1%
Switching value parameters	Rated switching value voltage	DC24V
	Switching value resolution	Minimum 2ms
EMC technology parameters	Insulation resistance	≥10MΩ
	Voltage mutation	100%，0.5s

	High-frequency interference（series mode）	1.5kVP，1min
	High-frequency interference（common mode）	2.5kVP，1min
	Transient pulse	4.0kVP，1min
	Inrush current interference	4.0kVP，1.2/50μ s
	Electrostatic discharge	8kV
	Power frequency magnetic fields	100A/m
	Damping oscillating magnetic field	100A/m
	Power frequency withstand voltage	2.5kV，1min
	Lightning rush voltage	5kV，1.2/50μs
	Enforce standards	DL/T 721-2000 class Ⅳ
Communication interface		1xRS485
Working environment machine case parameters	Ambient temperature	-25℃ ~ +70℃
	Storing temperature	-40℃ ~ +85℃
	Ambient humidity	5% ~ 95% (Non-congealing cream)
	Rate of ambient temperature change	<25℃/h
	Altitude range	-100~3000m
	Weight	＞2kg
	Size	165x81x91mm
	Class of protection	IP20

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Model & version	Model	RWB-300
	Version	V4.12.0
	Type of operating mechanism	Spring mechanism type
Power	Rated working voltage	230V ±20%
	Rated frequency	50Hz
	Electric energy consumption	≤5W
Analog parameters	Current transform quantity	3 phase current + 1 earth current
	Rated current in	5A or 1A
	Voltage transform quantity	4 voltage transform
	Voltage transform Nominal	40…120 Vrms
Protection relay and measurement accuracy	Current protection（secondar side）	0.08~20A ≤±2.5%
	Zore-sequence current protection（secondar side）	0.05~20A ≤±2.5%
	Voltage	20~280V ≤±2.5%
Protection performance parameters	Event resolution	2ms
	Quick-break export time	Under the input of 1.2In magnification, the whole group action time is less than 40ms
	Protect export time error	≤1%
Switching value parameters	Rated switching value voltage	DC24V
	Switching value resolution	Minimum 2ms
EMC technology parameters	Insulation resistance	≥10MΩ
	Voltage mutation	100%，0.5s

	High-frequency interference（series mode）	1.5kVP，1min
	High-frequency interference （common mode）	2.5kVP，1min
	Transient pulse	4.0kVP，1min
	Inrush current interference	4.0kVP，1.2/50μ s
	Electrostatic discharge	8kV
	Power frequency magnetic fields	100A/m
	Damping oscillating magnetic field	100A/m
	Power frequency withstand voltage	2.5kV，1min
	Lightning rush voltage	5kV，1.2/50μs
	Enforce standards	DL/T 721-2000 class Ⅳ
Communication interface		1xRS485
Working environment	Ambient temperature	-25℃ ~ +70℃
	Storing temperature	-40℃ ~ +85℃
	Ambient humidity	5% ~ 95% (Non-congealing cream)
	Rate of ambient temperature change	<25℃/h
	Altitude range	-100~3000m
Machine case parameters	Weight	＞2kg
	Size	165x81x91mm
	Class of protection	IP20

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Model & version	**Model**	**RWB-400Z**
	Version	V4.12.0
	Type of operating mechanism	Spring mechanism type
Power	Rated working voltage	230V ±20%
	Rated frequency	50Hz
	Electric energy consumption	≤10W
Analog parameters	Current transform quantity	3 phase current + 2 earth current
	Rated current in	5A or 1A
	Voltage transform quantity	4 voltage transform
	Voltage transform Nominal	40…120 Vrms
Protection relay and measurement accuracy	Current protection（secondar side）	0.08~20A ≤±2.5%
	Zore-sequence current protection（secondar side）	0.05~20A ≤±2.5%
	Voltage	20~280V ≤±2.5%
Protection performance parameters	Event resolution	2ms
	Quick-break export time	Under the input of 1.2In magnification, the whole group action time is less than 40ms
	Protect export time error	≤1%
Switching value parameters	Rated switching value voltage	DC24V
	Switching value resolution	Minimum 2ms
EMC technology parameters	Insulation resistance	≥10MΩ
	Voltage mutation	100%，0.5s
	High-frequency interference（series mode）	1.5kVP，1min
	High-frequency interference（common mode）	2.5kVP，1min
	Transient pulse	4.0kVP，1min
	Inrush current interference	4.0kVP，1.2/50μ s
	Electrostatic discharge	8kV

	Power frequency magnetic fields	100A/m
	Damping oscillating magnetic field	100A/m
	Power frequency withstand voltage	2.5kV，1min
	Lightning rush voltage	5kV，1.2/50μs
	Enforce standards	DL/T 721-2000 class IV
Communication interface		1xRS485
Working environment	Ambient temperature	-25℃ ~ +70℃
	Storing temperature	-40℃ ~ +85℃
	Ambient humidity	5% ~ 95% (Non-congealing cream)
	Rate of ambient temperature change	<25℃/h
	Altitude range	-100~3000m
Machine case parameters	Weight	> 2kg
	Size	201x150x107mm
	Class of protection	IP20

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Model & version	**Model**	**RWB-7000L**
	Version	V4.12.0
	Type of operating mechanism	Spring mechanism type
Rated data	Device power supply	AC/DC 110/220V or DC24V/48V (specify when order)
	State quantity level	AC/DC 110/220V or DC24V/48V outside (specify when order)
	Control power supply	DC220V, AC220V, DC110V, DC48V (specify when order)
	Line voltage	100 V
	Incoming line voltage	100 V or 100/ √ 3 V
	Alternating current	5A or 1A (specify when order)
	Rated frequency	50Hz
Power consumption	DC circuit	Normal work: no more than 10W
		Action: No more than 15W
	AC voltage circuit	Not more than 0.5VA per phase
	AC current circuit	The rated current is 5A:Not more than 1VA per phase
		The rated current is 1A:Not more than 0.5VA per phase
Precise working range of sampling circuit	Voltage	0.005~1.2Un
	Current	0.08In~20In
Precision of various components	Current component	<±3%
	Voltage component	<±3%
	Synchronizing angle	<±1°
	Time component	When 0s~2s, the error is not more than ±40ms; When more than 2s, the error is not more than ±3%;
	Frequency deviation	<±0.02Hz
	Slip setting value	<±5%
Power Frequency Analog Measurement Precision	AC voltage, AC current	≤±0.2%
	Active power, reactive power	≤±0.5%
Overload capacity	AC current circuit	2 times the rated current continuous work
		10 times the rated current allow to work 10s
		40 times the rated current allow to work 1s
	AC voltage circuit	1.2 times the rated current continuous work
	Power supply circuit	80%~110% rated voltage continuous work

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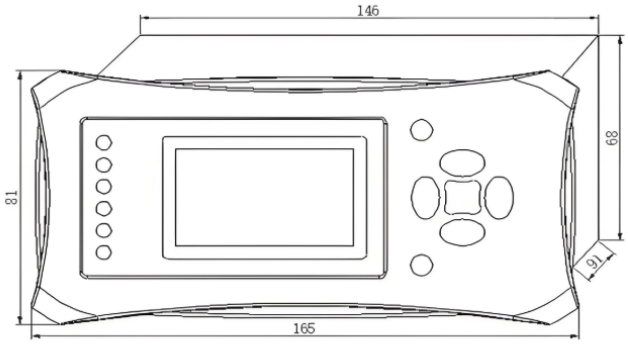
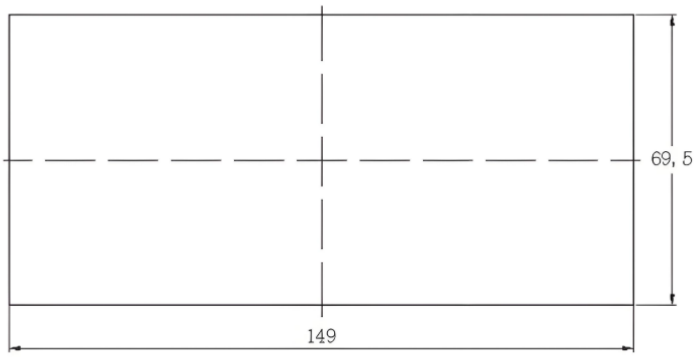
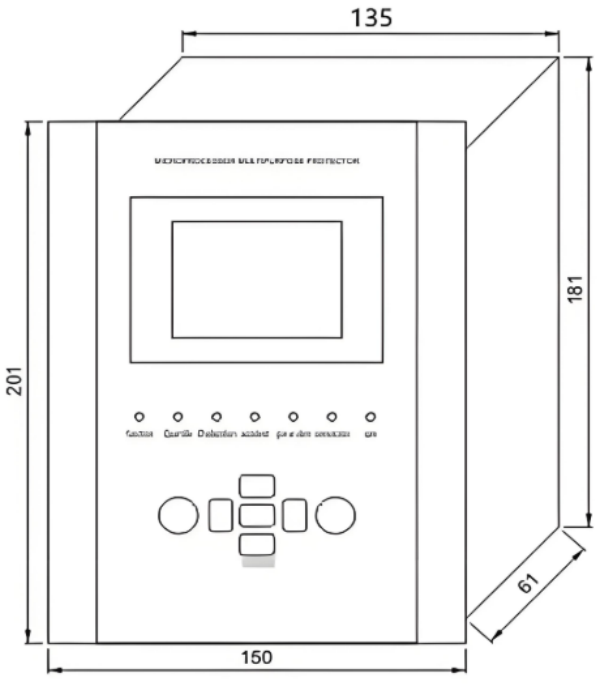
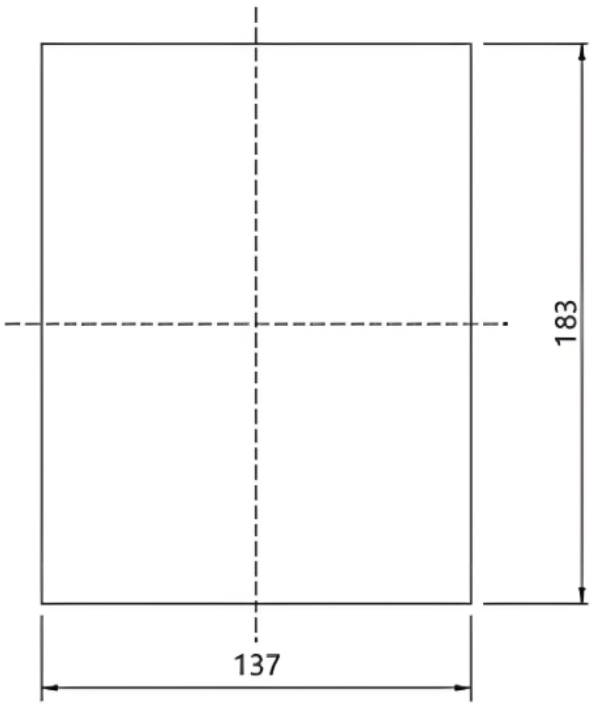
RWB-200





RWB-300





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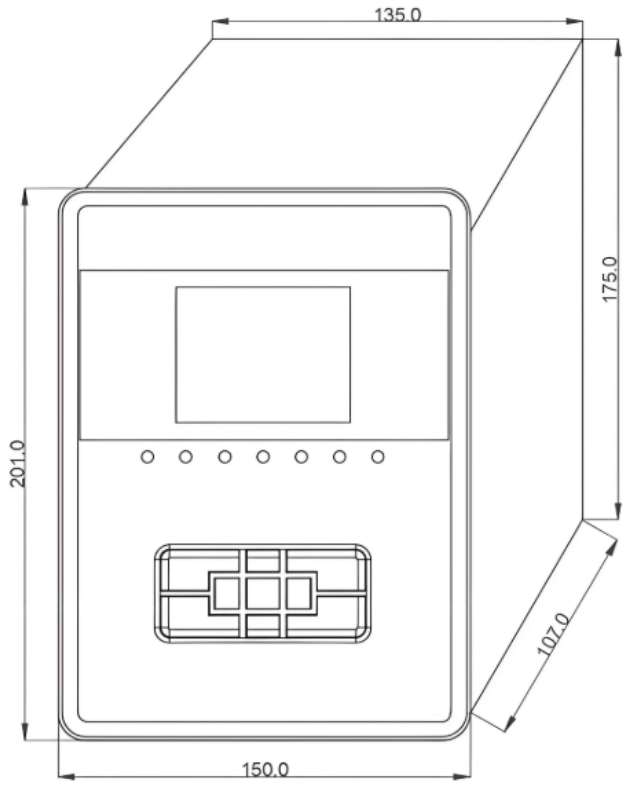
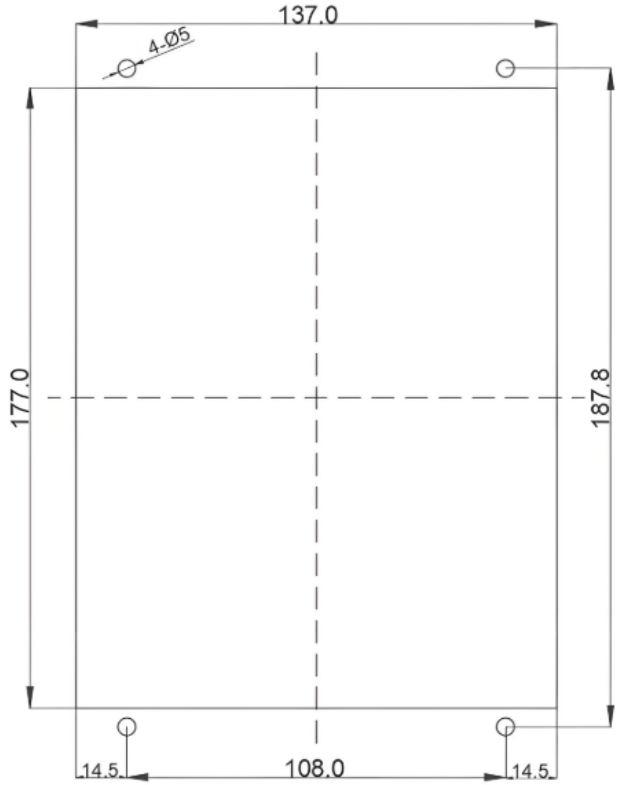
RWB-400Z





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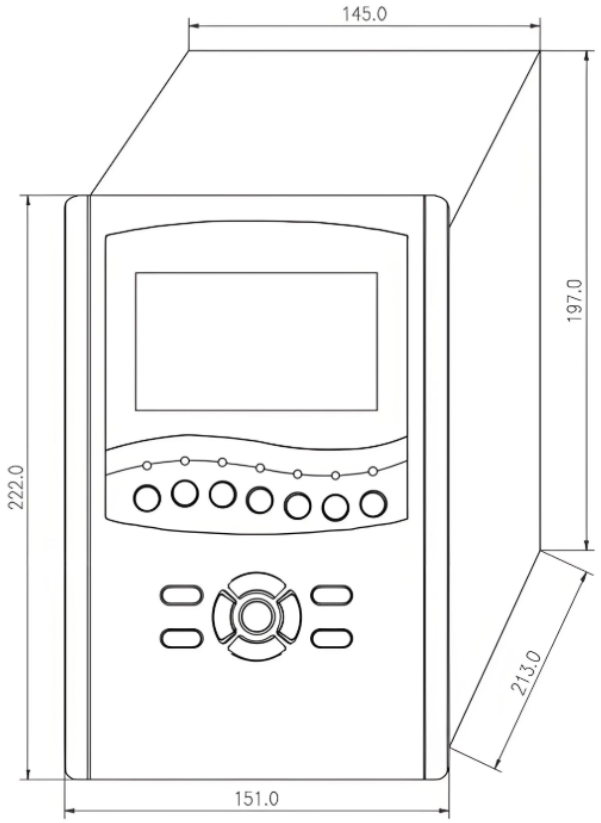

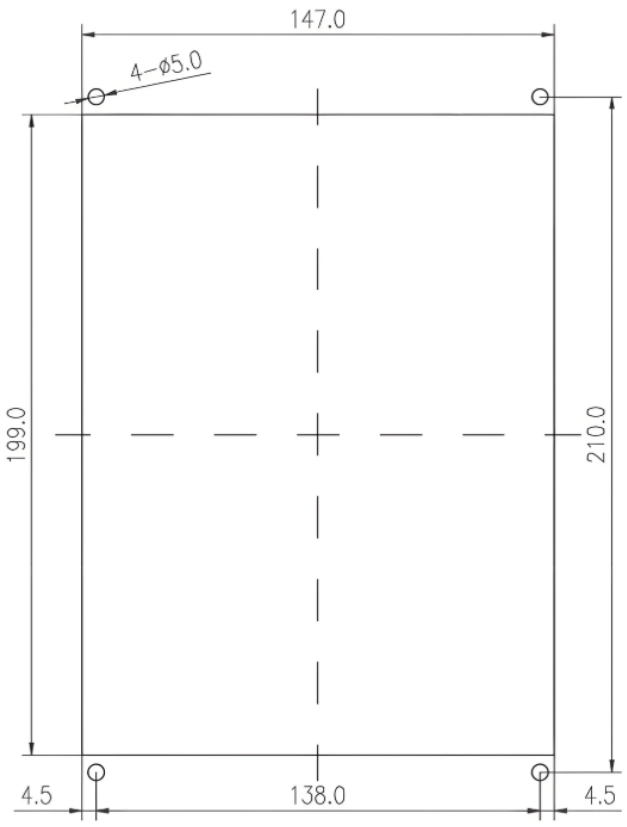

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Device terminal definition diagram

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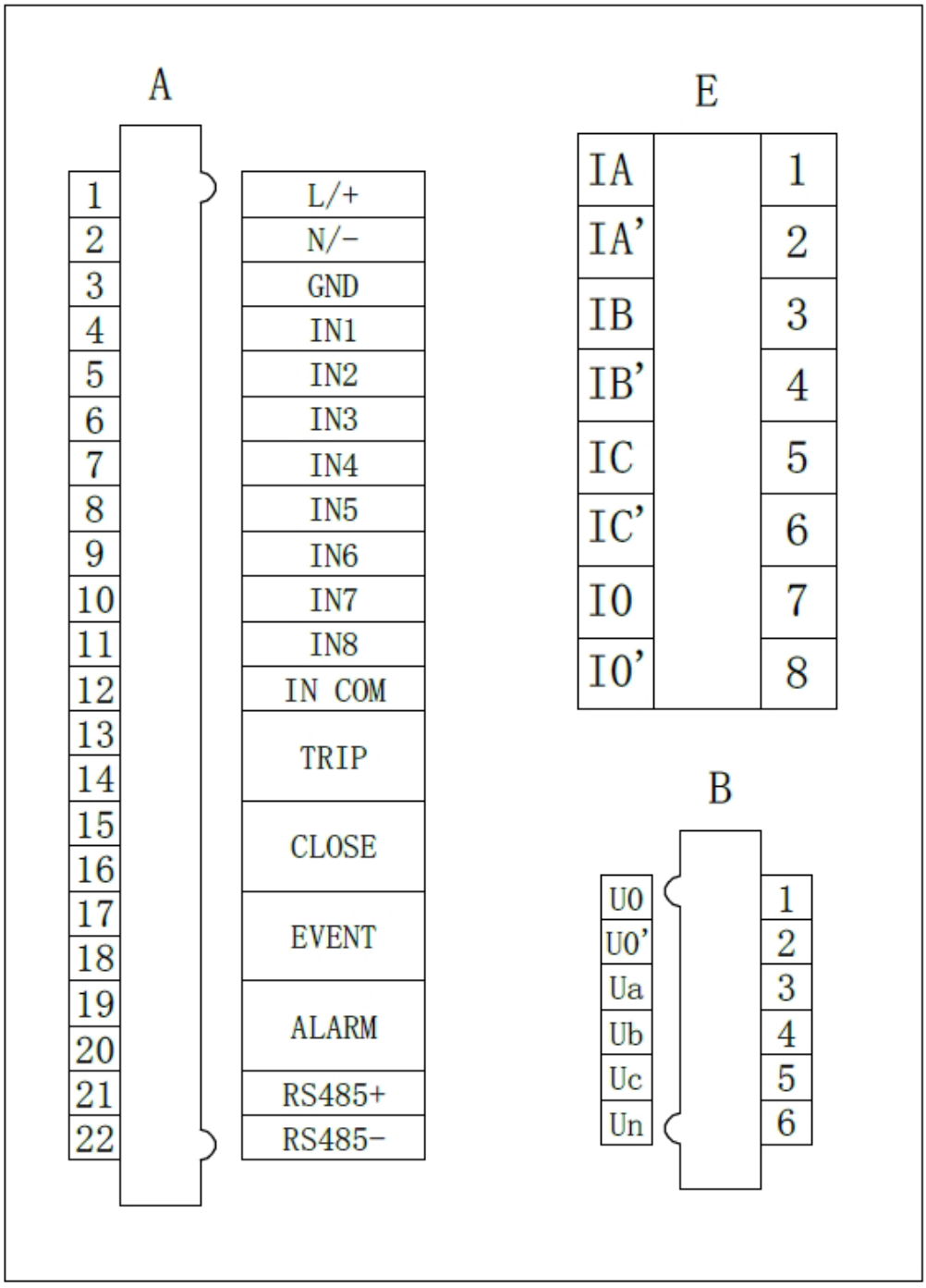

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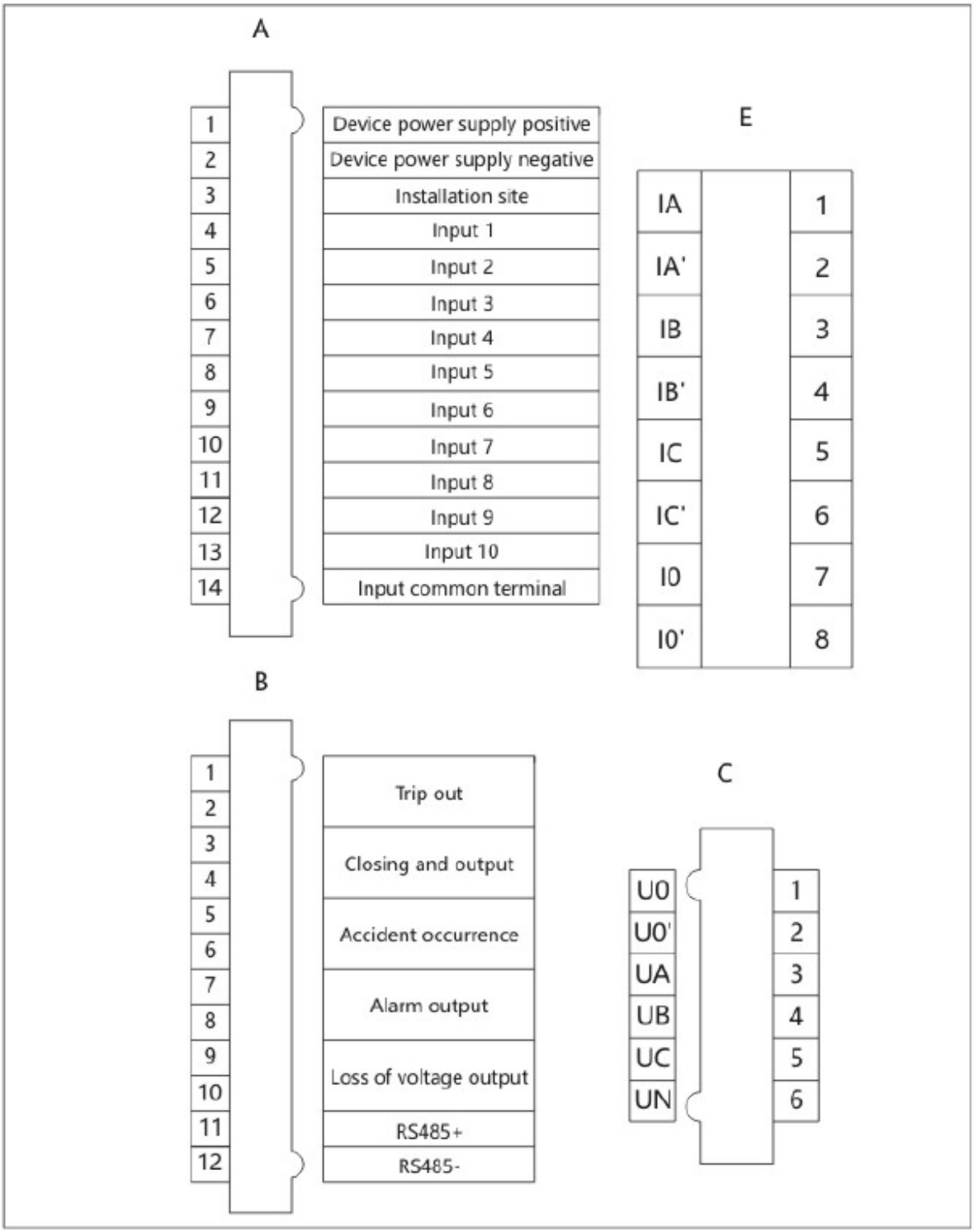

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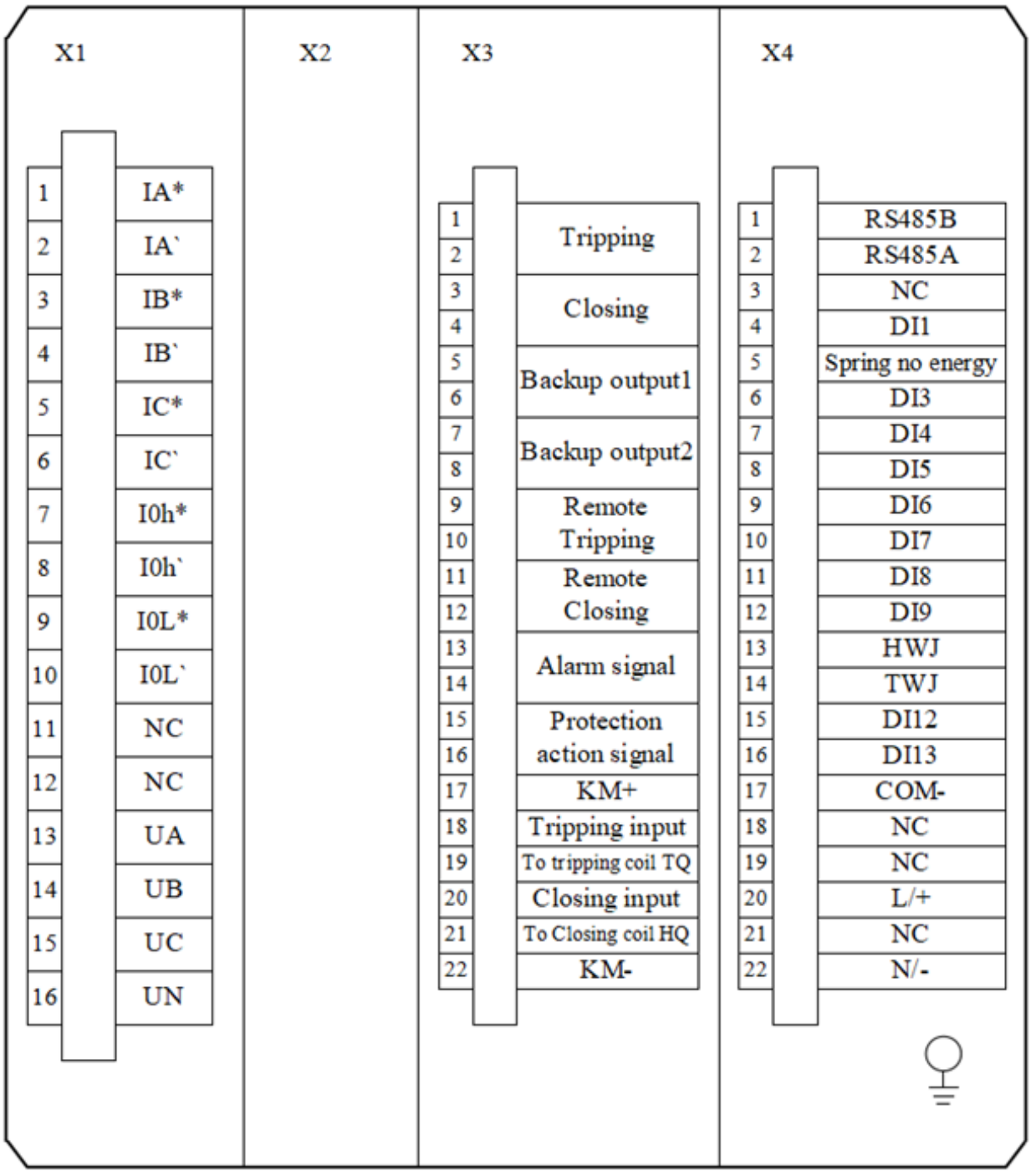

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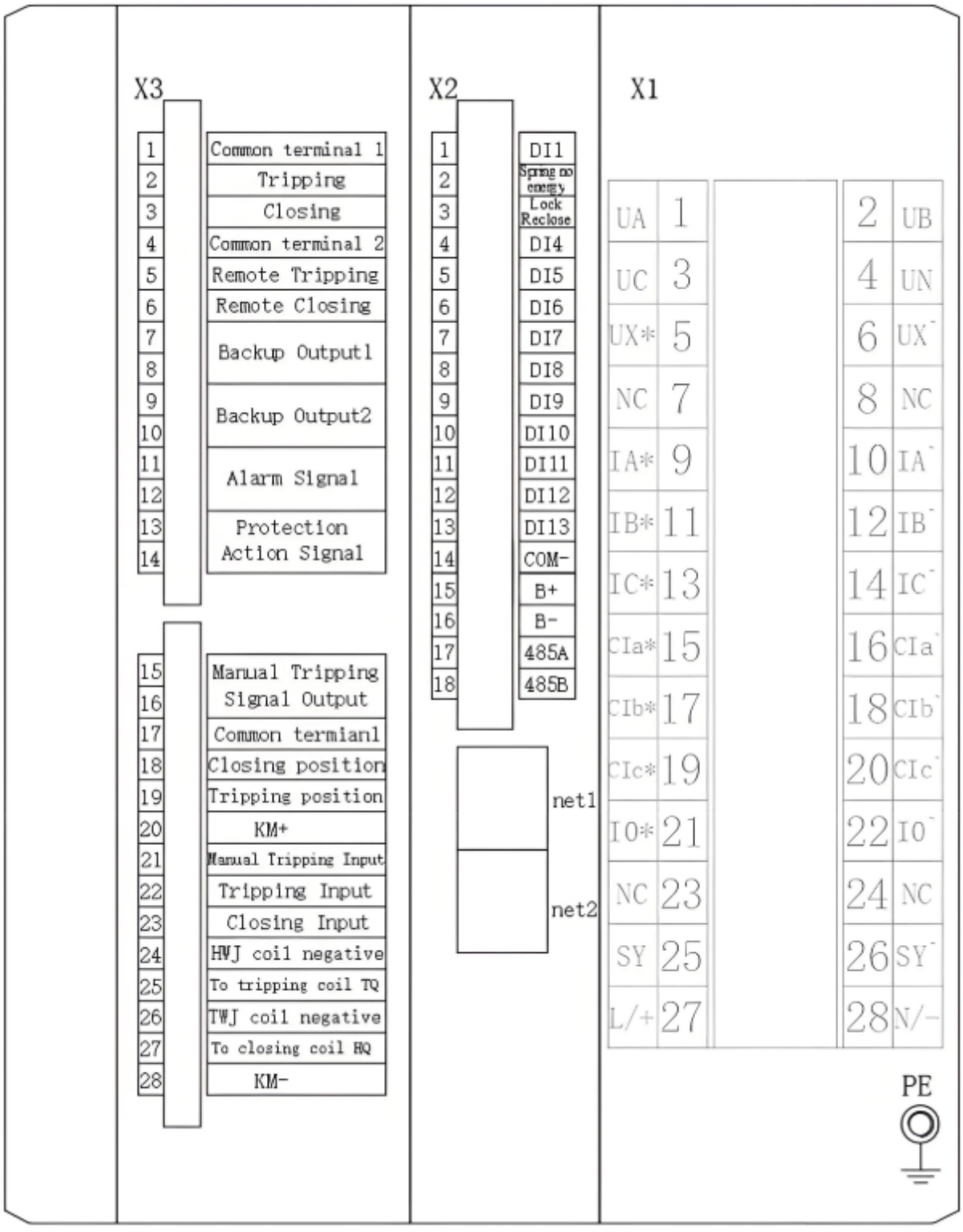

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Field service operation and warranty issues:

RW ENERGY® can provide competent, well trained field service representatives to provide technical guidance and advisory assistance for the installation, overhaul, repair and maintenance of RW ENERGY® equipment, processes and systems.

RW ENERGY® service Tel: +86 (577) 27819965
Email: Support@ rw-relay.com
Or check the website information: https://www.rw-relay.com/

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