NO:2022.10

CHINT ELECTRICS

IMU-M8
Intelligent Measuring Unit

Instruction Manual

This Product Manufacturer has passed the following Management System Certifications: ISO 9001, ISO 14001 and ISO 45001

Standard: IEC 61557-12/ IEC 61326-1/IEC 61010-1

CHINT

Enpower the World

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⚠ Safety Alert

1. It is strictly prohibited to install the product in the environment containing flammable & explosive gas and wet condensation, and it is strictly prohibited to operate the product with wet hand.
2. Do not touch the conductive part of the product during product operation stage .
3. When installing, repairing and maintaining the product, ensure that the line is powered off.
4. Children are strictly prohibited from playing with products or packaging
5. Do not install in place where gas medium can corrode metal and damage insulation.
6. In order to avoid dangerous accident, the product must be installed and fixed in strict accordance with the requirements of this Instruction Manual.
7. After removing package, please check the integrity of the parts and ensure the product are intact.
8. This product is suitable for environment A. The use of this product in environment B will produce harmful electromagnetic interference. In this case, the User shall take appropriate protective measure.

1 Main Purpose and Scope of Application

This Instruction Manual specifies the normal working conditions, main specifications, technical parameters, overall and installation dimensions of IMU-M8 Series Intelligent Measuring Unit.
This Instruction Manual is applicable to IMU-M8 Series Intelligent Measuring Unit (Hereinafter referred to as Measuring Unit), and is applicable to circuits with AC 50Hz, rated voltage AC 415V and below, and rated current up to 756A and below.

2 Series Model, Specification and Meaning

IMU 22 - M8 250 3P T B D
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Product Model
② Frame Current Code
22: NM8N-250
23: NM8N-400/630
③ Series Code:
M8: NM8N Series
④ Rated Current:
250: 250A
400: 400A
630: 630A
⑤ Number of Poles:
3P: 3P
4P: 4P
⑥ Low-voltage Distribution Grounding System
T: (TT or TN)
I: IT
blank: (TT or TN)
⑦ Communication Mode:
B: Bluetooth 5.0 + RS485
⑧ Display Type:
D: With LCD Screen
blank: Without LCD Screen

3 Normal Service, Installation, and Transportation & Storage Conditions

3.1 Normal Service Conditions
-The ambient air temperature is -25℃ ~+70℃ , and the average temperature within 24h shall not exceed + 35 ℃.
-When the maximum temperature is + 70 ℃, the relative humidity of the air shall not exceed 50%. Higher relative humidity can be allowed at lower temperature(Such as 90% at + 20 ℃). Special measures shall be taken for the occasional condensation due to temperature change;
-The altitude of the installation site shall not exceed 2000m.
-Pollution degree: II.
3.2 Installation Conditions
Under the conditions of Safety Alert, it shall be installed in the place with rain and snow proof equipment,

not filled with water vapor, no significant shaking, impact and vibration; The inclination between the mounting surface and the vertical surface shall not be greater than ±5°; Installation Class III.

3.3 Transportation & Storage Conditions

The applicable temperature range for transportation & storage is from -40℃ to +70℃, and can reach +70 ℃ in a short time (24h). The storage place shall be ventilated and dry, and shall not be attacked by rain, snow and shall not be exposed to direct sunlight.

4 Main Technical Parameters

4.1 Measurement Function

Current	Phase current:Ia、Ib、Ic
	Neutral current (4P): In
	Ground fault current (4P): Ig
	Current unbalance:ε_i , Iur
	Maximum phase current and neutral current
Voltage	Line voltage:Uab、Ubc、Uca
	Phase voltage:Uan、Ubn、Ucn
	Voltage unbalance:ε_u, Ulur, Unur
Power	Active power (kW):P, three-phase and per phase
	Reactive power (kVAR):Q, three-phase and per phase
	Apparent power (kVA):S, three-phase and per phase
Energy	Active energy (kWh) three-phase and per phase
	Reactive energy (kVARh) three-phase and per phase
	Apparent energy (KVAh) three-phase and per phase
Power Factor	PF and cosϕ (Per phase) three-phase and per phase
Frequency	F
Harmonic	Total harmonic distortion measurement THDi, THDu
Temperature (Optional)	Measure the temperature at the outlet connection between the Module and the Molded Case.

4.2 Power Freezing Function

Daily Electric Energy Freezing: When pass zero'o clock every day, freeze the current positive active power and total electric energy, reverse active power and total electric energy, positive reactive power and total electric energy, reverse reactive power and total electric energy, and record the current time identification (Month, Day, Hour and Minute).

Monthly Electric Energy Freezing: When pass zero'o clock at the end of each month, freeze the current positive active power and total electric energy, reverse active power and total electric energy, positive reactive power and total electric energy, reverse reactive power and total electric energy, and record the current time identification (Month, Day, Hour and Minute).

Instant Electric Energy Freezing: Send the Freezing command, and the Energy Meter can freeze the positive active power and total electric energy, reverse active power and total electric energy, positive reactive power and total electric energy, reverse reactive power and total electric energy at that time, and record the current time identification (Month, Day, Hour and Minute).

4.3 Event Alarm

Alarm and Event Recording Functions (Setting parameters through communication): A-phase overvoltage /B-phase overvoltage/C-phase overvoltage/A-phase undervoltage/B-phase undervoltage/C-phase undervoltage/Overfrequency/Underfrequency/Power factor exceeding the lower limit/Current imbalance/ Voltage imbalance/A-phase missing/B-phase missing/C-phase missing/Reverse power/Phase-sequence error/A-phase overtemperature/B-phase overtemperature/C-phase overtemperature/Voltage harmonic exceeding the limit/Current harmonic exceeding the limit/Power on after power loss (Only record without alarm).

When an event alarm occurs, the event and timestamp will be stored in the internal memory and can be read through the communication protocol. See Annex (IMU-M8 Communication Protocol).

4.4 Advanced Protection Function(Optional)

Advanced Protection Function (Setting parameters through communication): With switching function, can be set to OFF, When A-phase overvoltage/B-phase overvoltage/C-phase overvoltage/A-phase undervoltage/B-phase undervoltage/C-phase undervoltage/Overfrequency/Underfrequency/Power factor exceeding the lower limit/Current imbalance/Voltage imbalance/A-phase missing/B-phase missing/C-phase missing/Power reversed/Phase-sequence?error/A-phase overtemperature/B-phase overtemperature /C-phase overtemperature/Voltage harmonic exceeding the limit/Current harmonic exceeding the limit, when any protection function is triggered, the Output PWM Level will trigger the magnetic flux to the molded case shunt to realize the protection function.

When the advanced protection function occurs, the event and timestamp will be stored in the Internal memory and can be read through the communication protocol. See Annex (IMU-M8 Communication Protocol).

4.5 Basic Communication Parameters

RS485 Communication: baud rate: 1200bps、2400bps、4800bps、9600bps、19200bps; The default value is 9600bps.

Data Bit: 8;

Parity Bit: No Parity or Even Parity; The default value is Even Parity.

Stop Bit: 1;

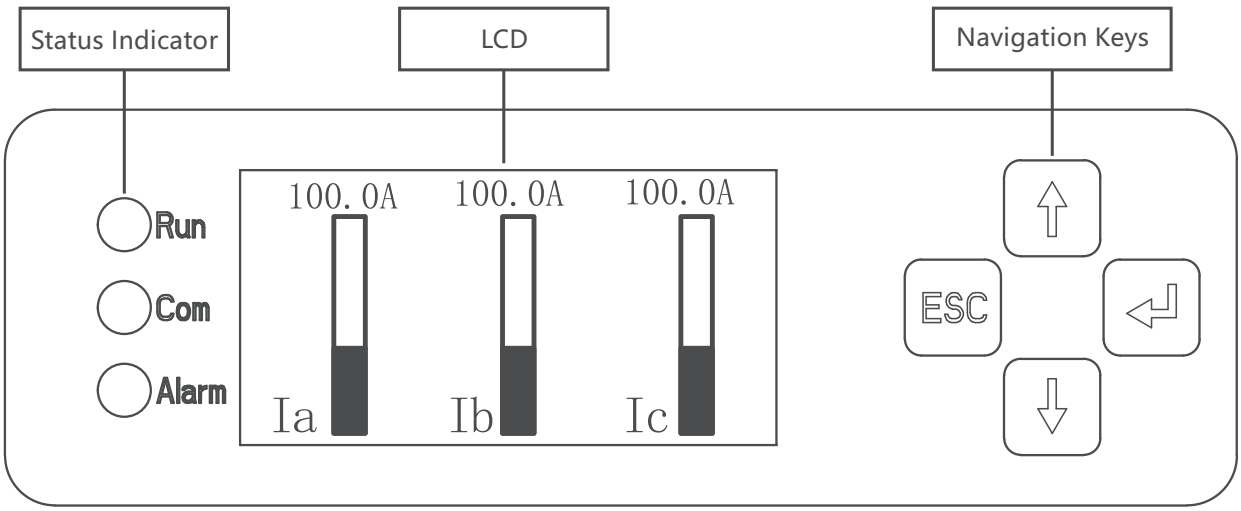
4.6 Impulse withstand voltage description

Table1 Impulse withstand voltage description

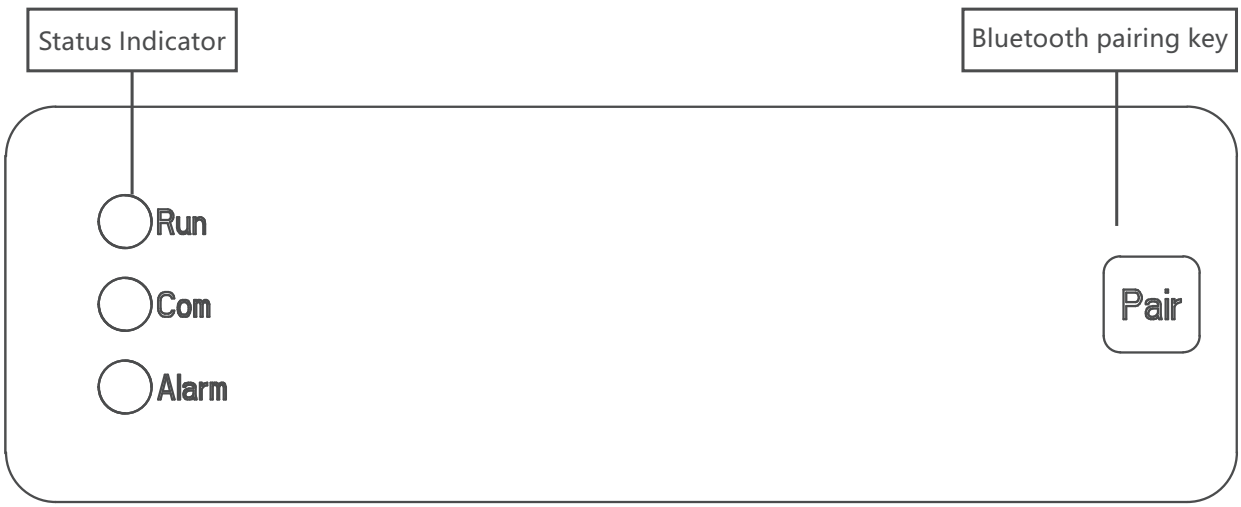
Impulse withstand voltage Uimp (kV)	Test voltage and corresponding altitude					Note
	$U_{1.2/50}$ kV					
	Altitude	200m	500m	1000m	2000m	
6	7.3	7.2	7	6.7	6	Please pull out controller module before conducting dielectric test
8	9.8	9.6	9.3	9	8	Please pull out controller module and disconnect voltage supply cable before conducting dielectric test

5 Controller Functions

5.1 Interface of IMU-M8 Series Intelligent Measuring Unit



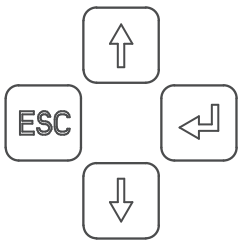
(a)



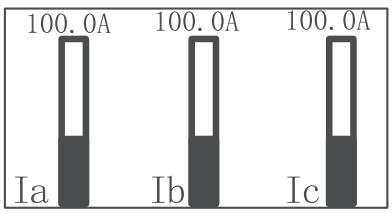
(b)

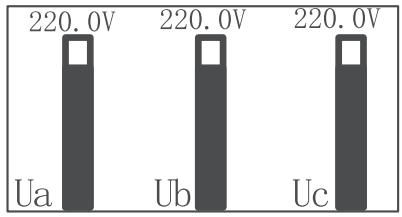
Interface and Operation Guide of IMU-M8
(a) Type with LCD (b) Type without LCD

Operation: Operation Status Indicator(Green). In working status, the Green Indicator keeps flashing.
Communication: Communication Status Indicator(Yellow). When receiving or sending data, the Yellow Indicator keeps flashing.
Alarm: Alarm Status Indicator(Red). When over-voltage and under-voltage faults occur, the Red Alarm Indicator is ON. After the fault is eliminated, the Indicator is OFF.

Navigation Keys		
	"Direction"key	Press the key of PageUp/PageDown to set parameter value to increase or decrease.
	"OK" key	Enter the Parameter Interface and confirm the modified value or status. Long press the key (3 sec) to start the Bluetooth pairing function.
	ESC "ESC" key	Cancel or return to the previous menu
	**Pair** Bluetooth Pairing key	Long press the key (3 sec) to start the Bluetooth pairing function.

Current voltage cycle display interface:

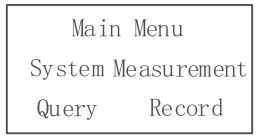




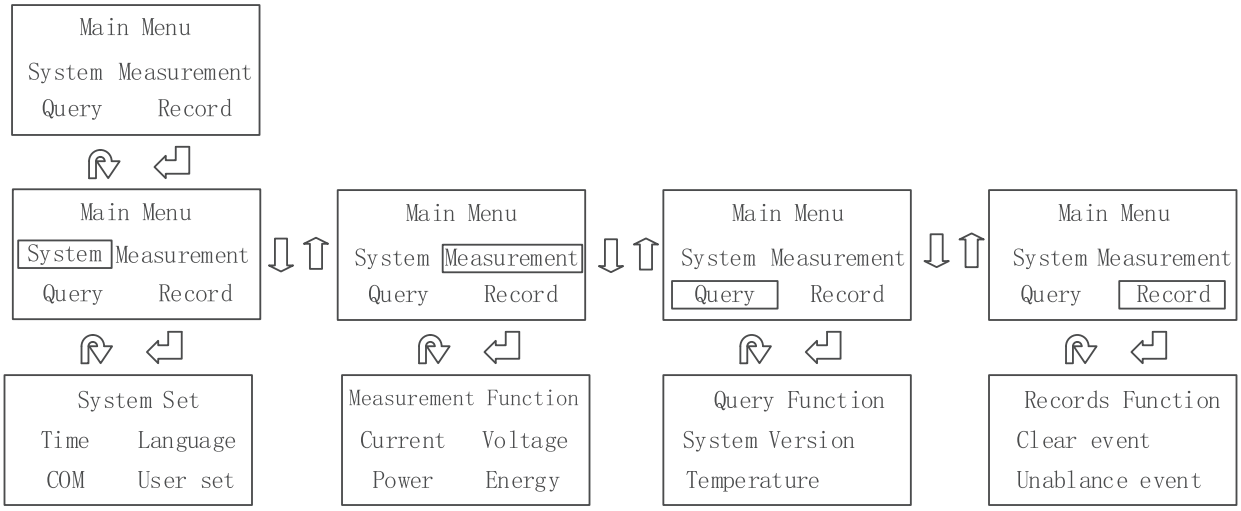
If there is no operation on the display interface within 1min,screen turned off automatically.

5.2 Operation instructions

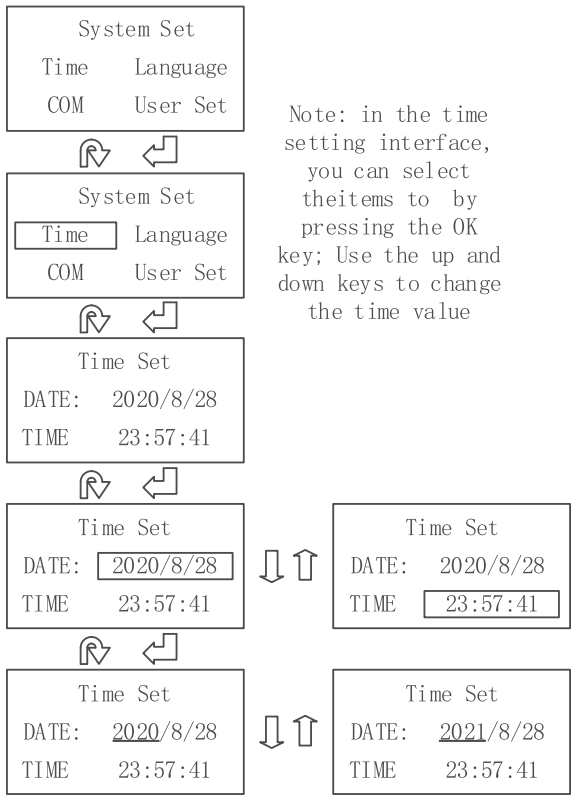
Main Menu: Press Enter Key at loop display mode to enter into main menu.



Menu flow chart:

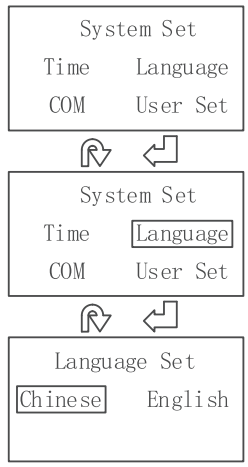


System setting: (time setting)

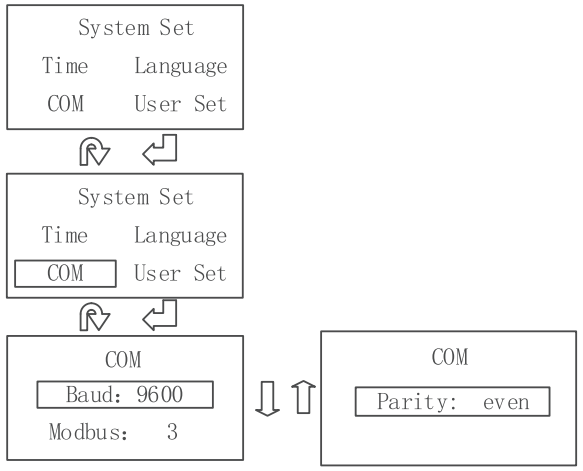


Note: in the time setting interface, you can select theitems to by pressing the OK key; Use the up and down keys to change the time value

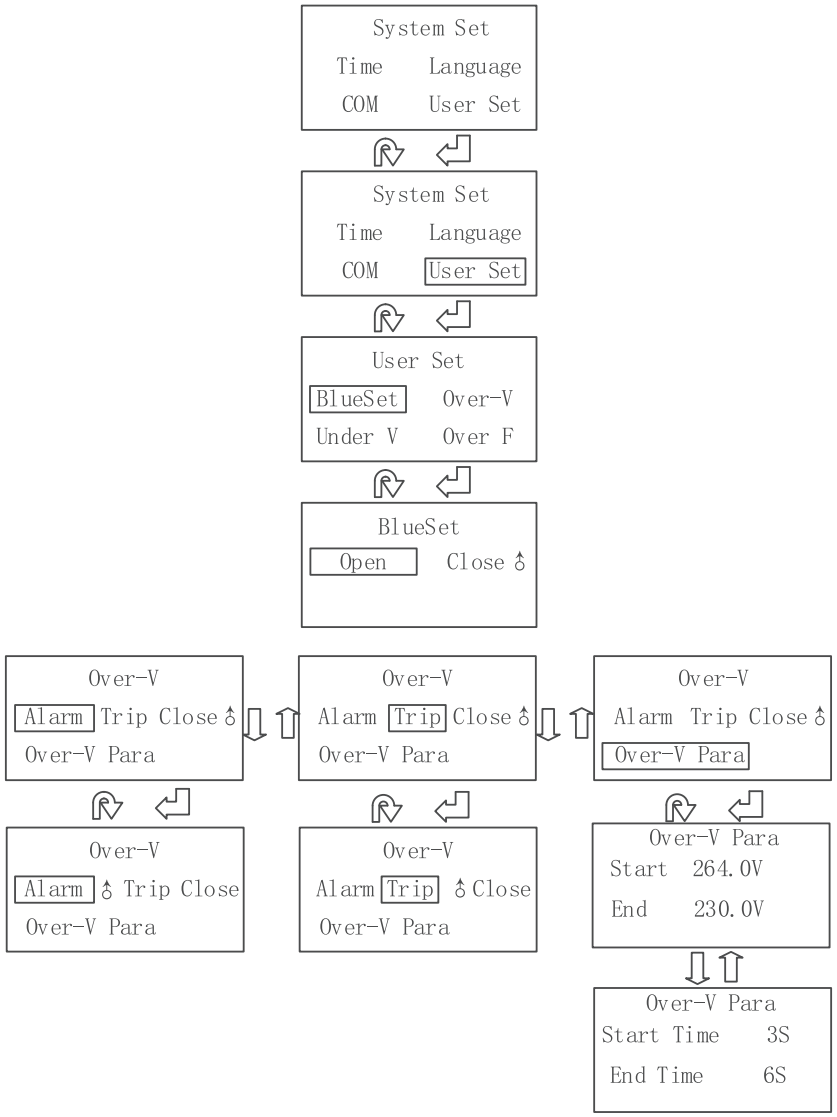
System settings: (language settings)



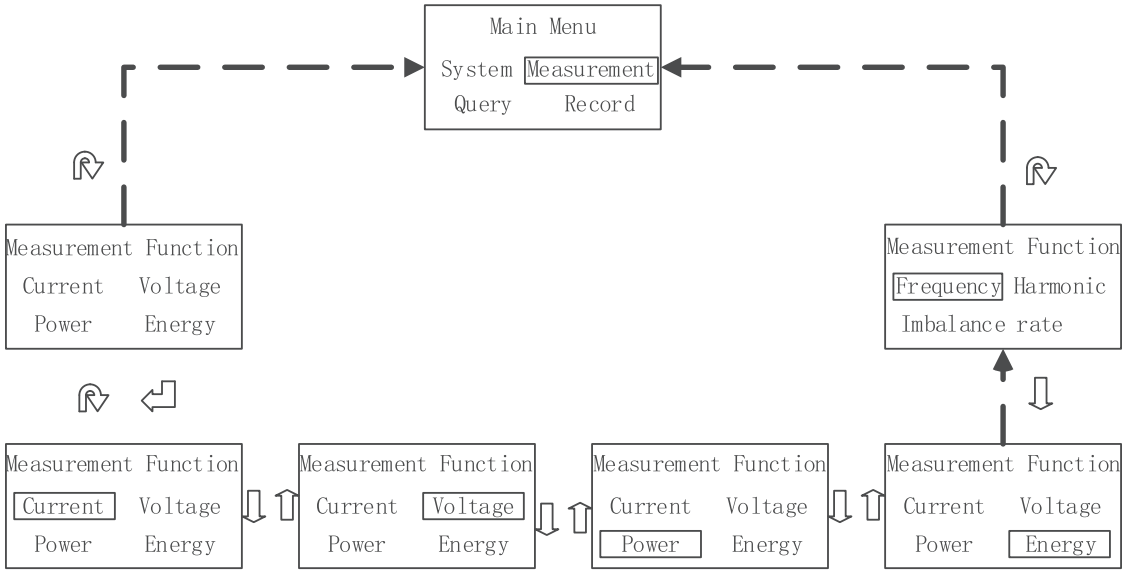
System settings: (communication settings)



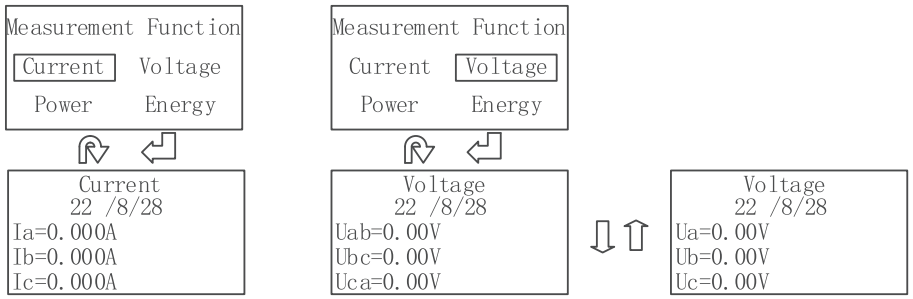
System settings: (User settings)

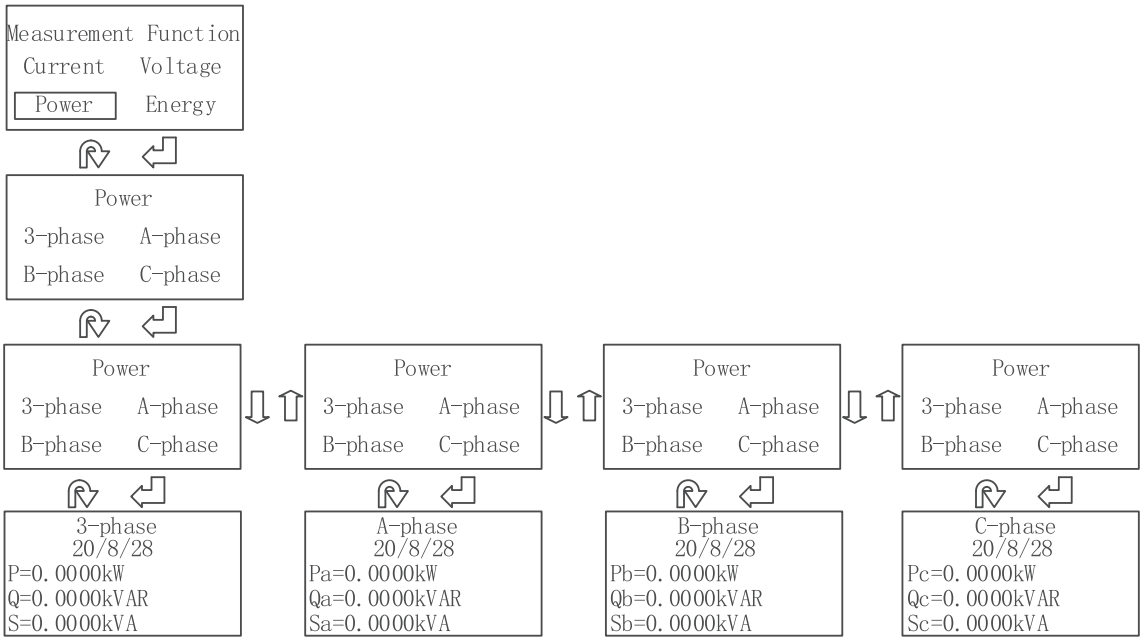


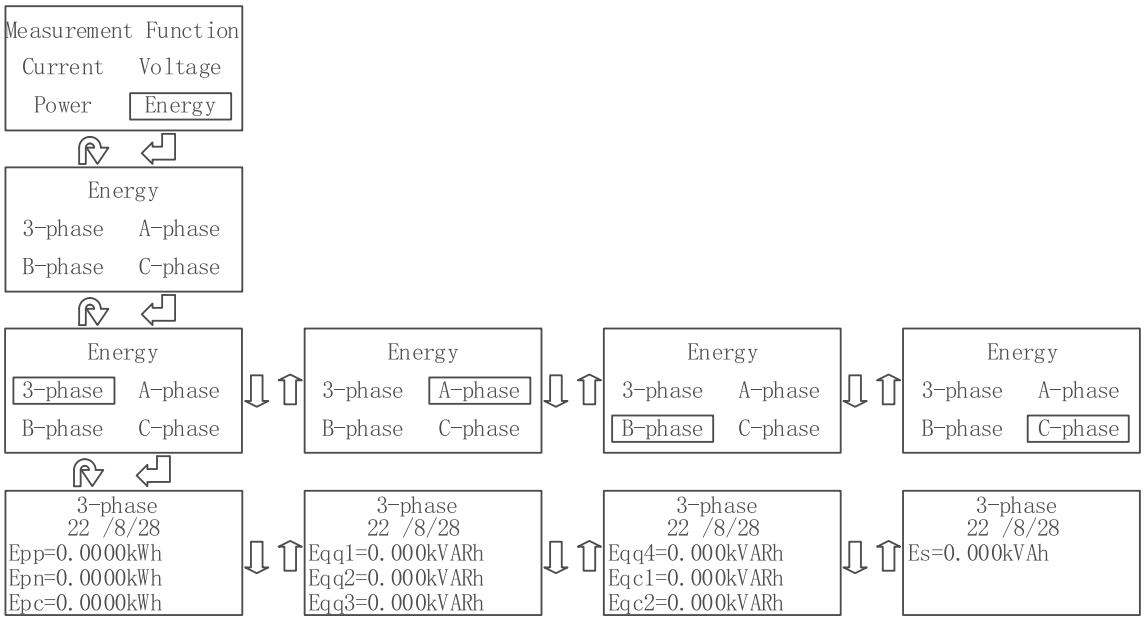
Measurement function:



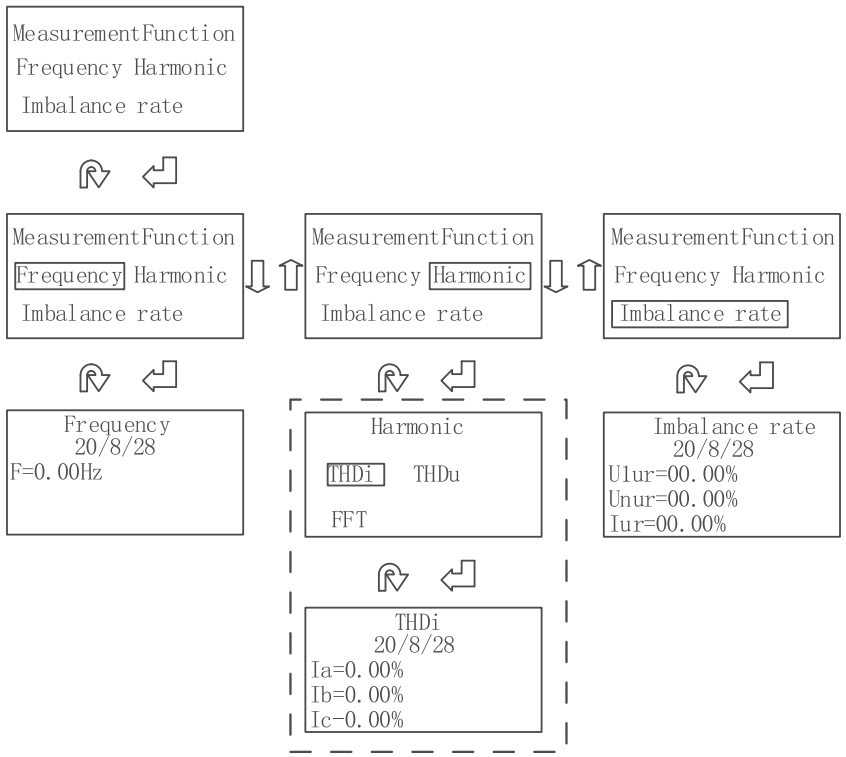
Current / Voltage / Power / Electric energy:



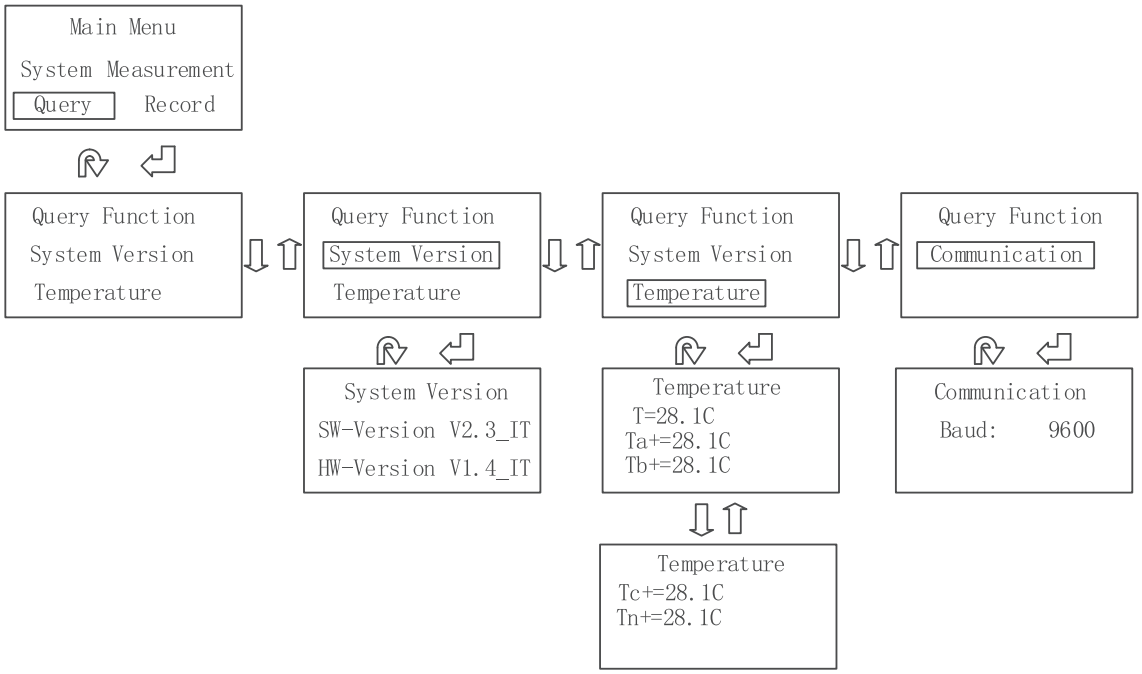




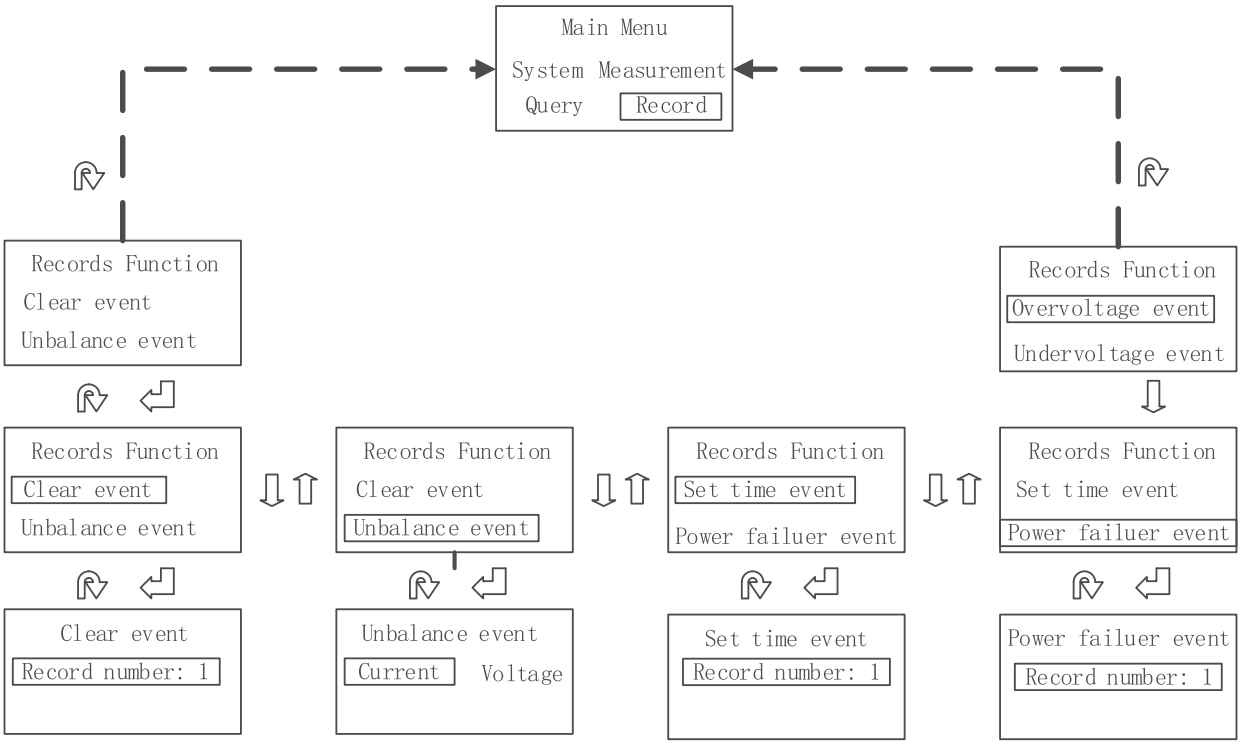
Voltage current imbalance / Power factor / Frequency:



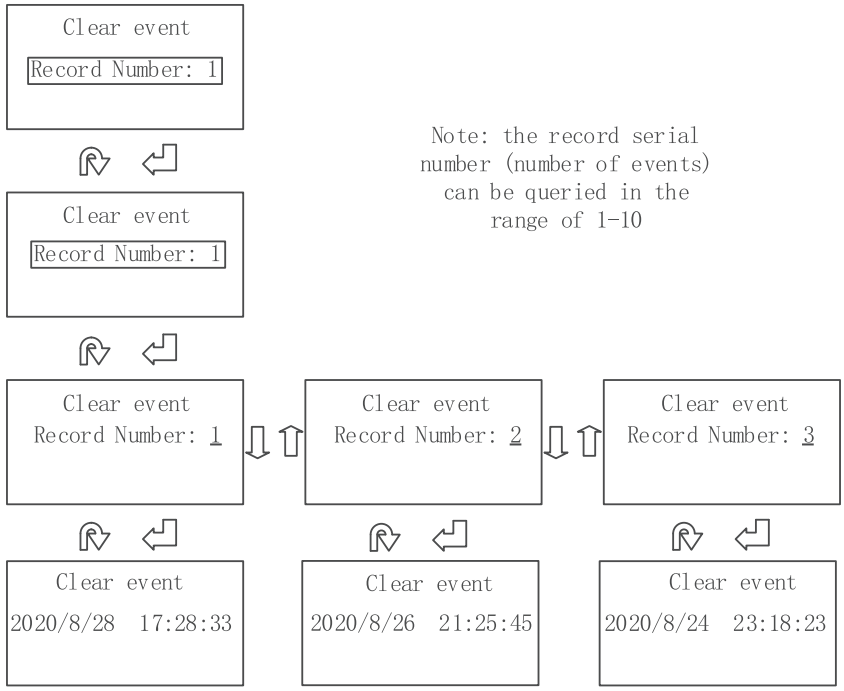
Query function:



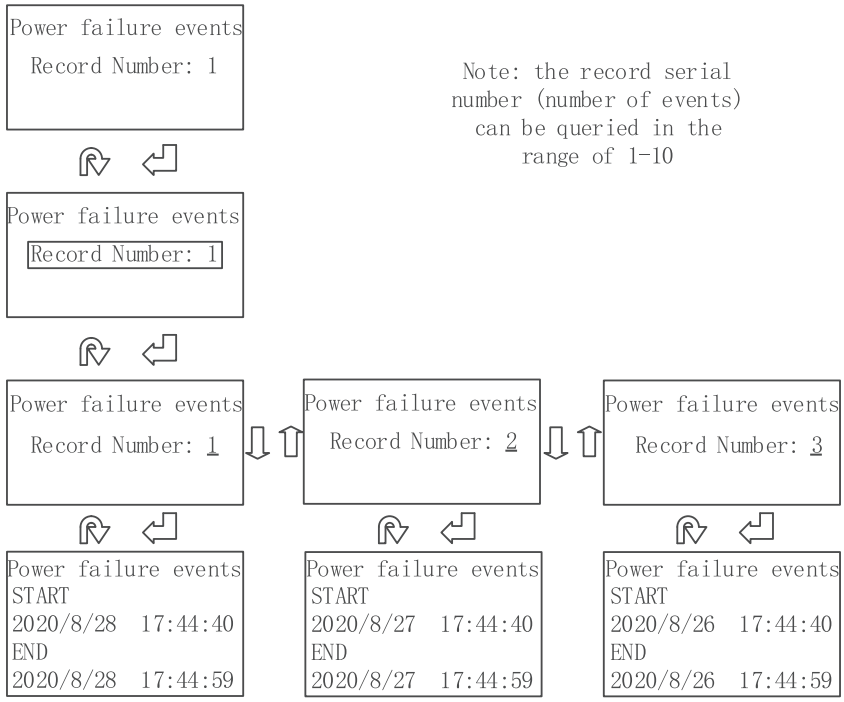
Record query:



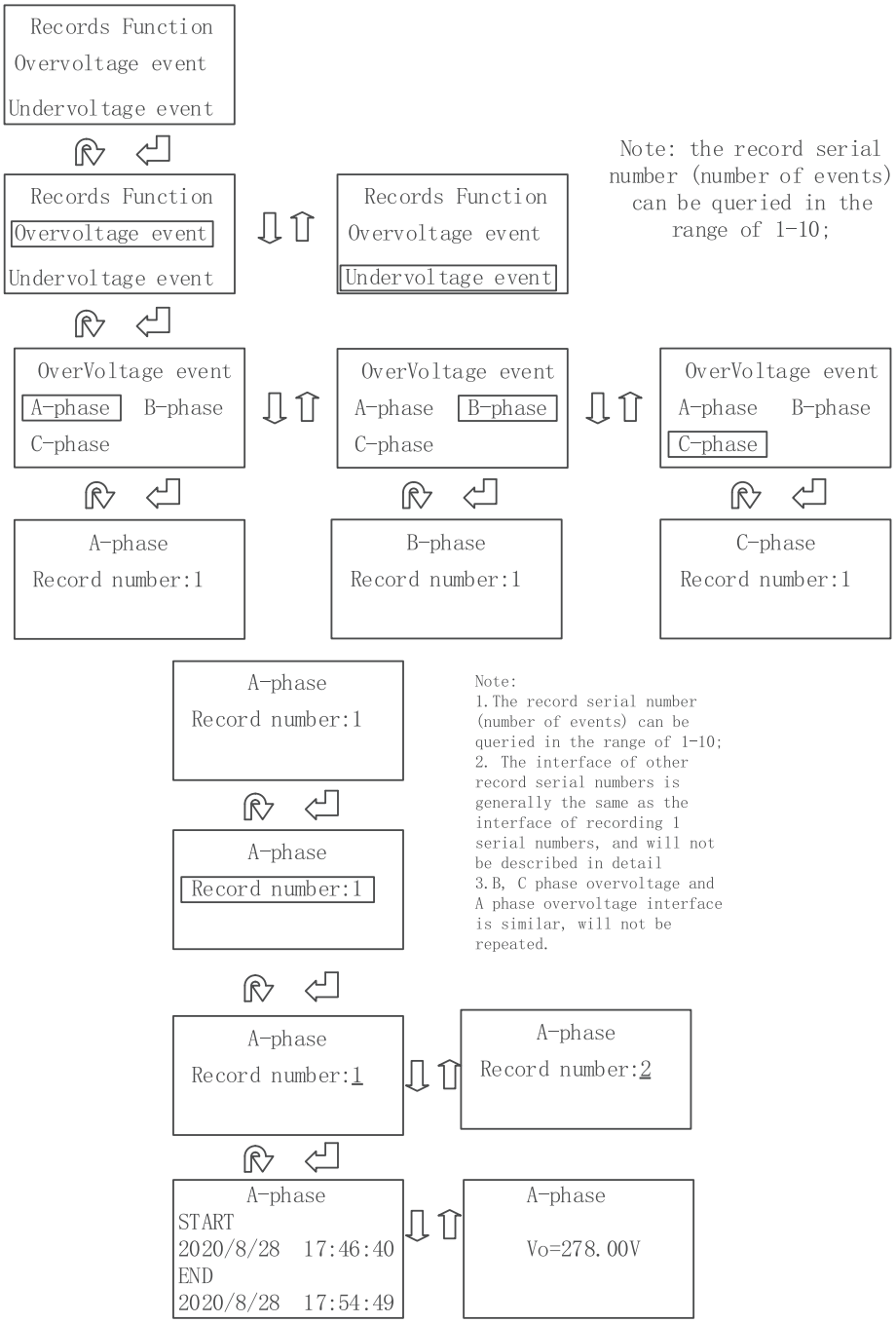
Clear event:



Power failure events:



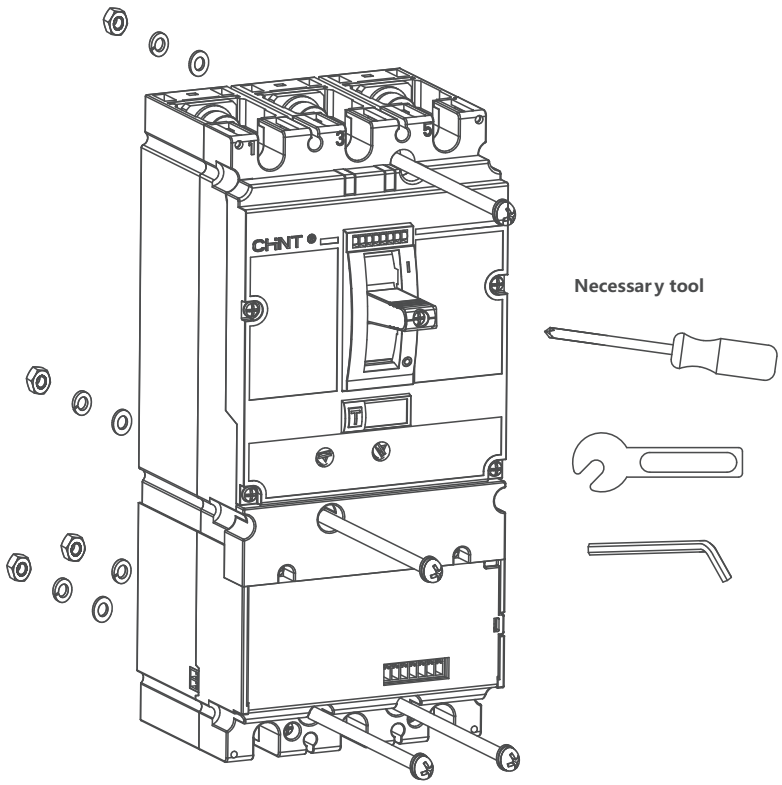
Overvoltage and undervoltage events:

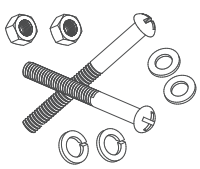


Record query is classified into fault record and alarm record, each has 10 logs. The types in the record interface are the causes of such records, mainly including:
A-phase overvoltage / B-phase overvoltage / C-phase overvoltage / A-phase undervoltage / B-phase undervoltage / C-phase undervoltage / overfrequency / Underfrequency / power factor exceeding the lower limit / current imbalance / voltage imbalance / A-phase missing phase / B-phase missing phase / C-phase missing phase / reverse power / phase staggering sequence / A-phase overtemperature / B-phase overtemperature / C-phase overtemperature / voltage harmonic overrun / current harmonic overrun / power failure (only record without alarm).

6 Check

Inspection



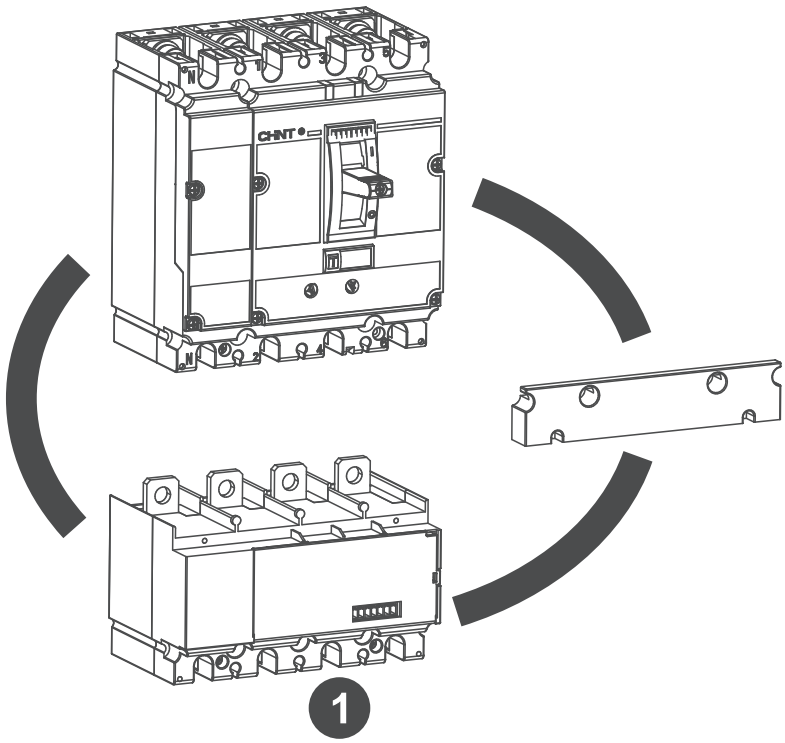
Model			
IMU22-M8	3P	2(M5x75)	3(M8x20)
	4P	3(M5x75)	4(M8x20)
IMU23-M8	3P	2(M5x85)	3(M10x30)
	4P	3(M5x85)	4(M10x30)

(The above does not include the number of screw assemblies of NM8N.)

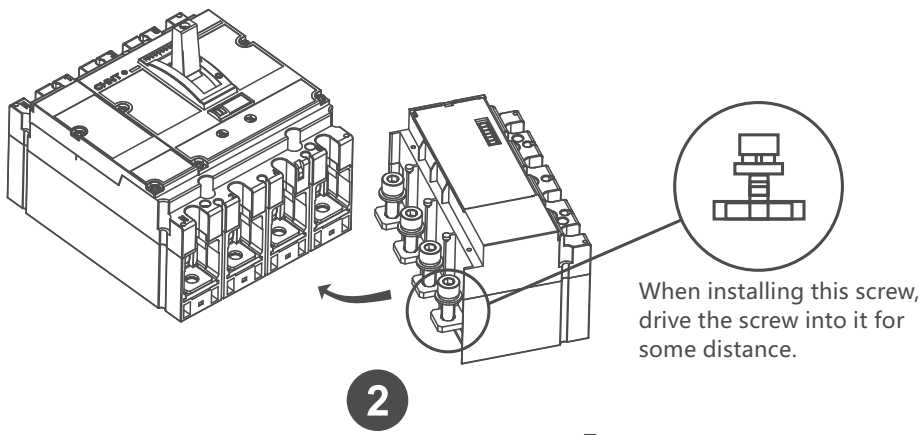
1.Determine the Product technical parameters;
2.The installation, operation, repair and maintenance of the Product are limited to professional qualified personnel.

7 Installation

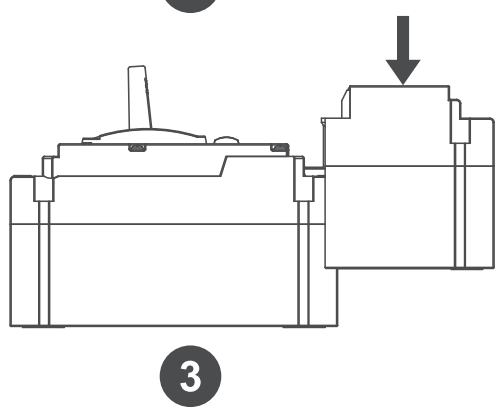
General structure chatr



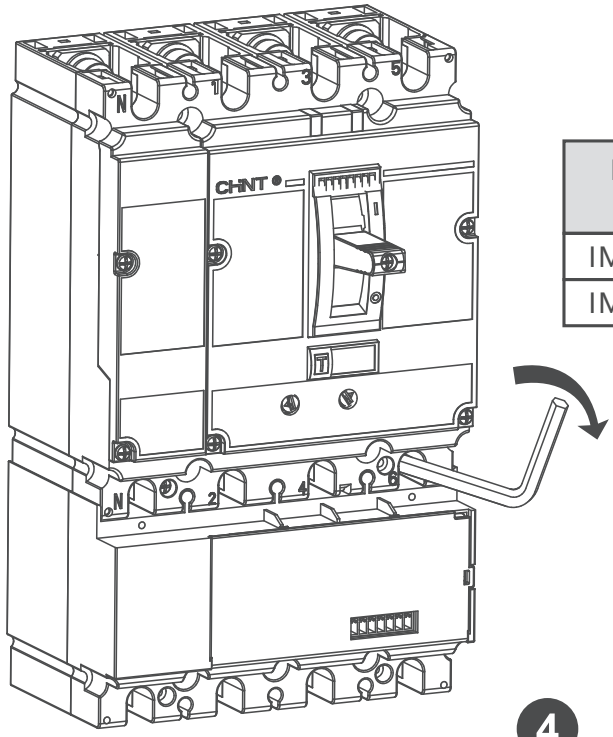
Connecting installation



Staggered installation



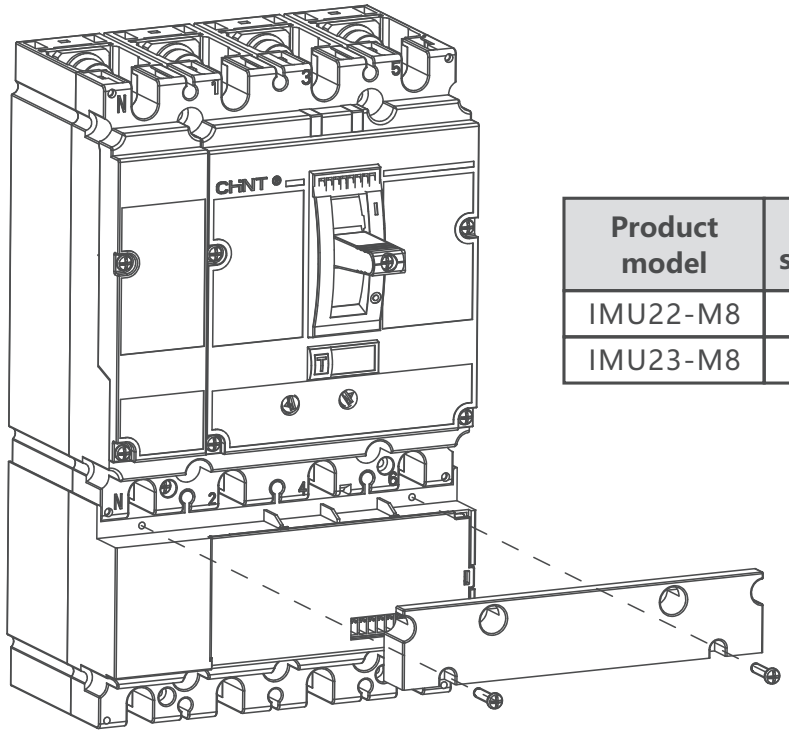
Screw fastening



Product model	Screw specification	Torque (N.m)
IMU22-M8	M8x20	11
IMU23-M8	M10x30	25

4

Cover plate installation



Product model	Screw specification	Torque (N.m)
IMU22-M8	ST2.9x16	1.5
IMU23-M8	ST2.9x16	1.5

5

8 Overall and installation dimension

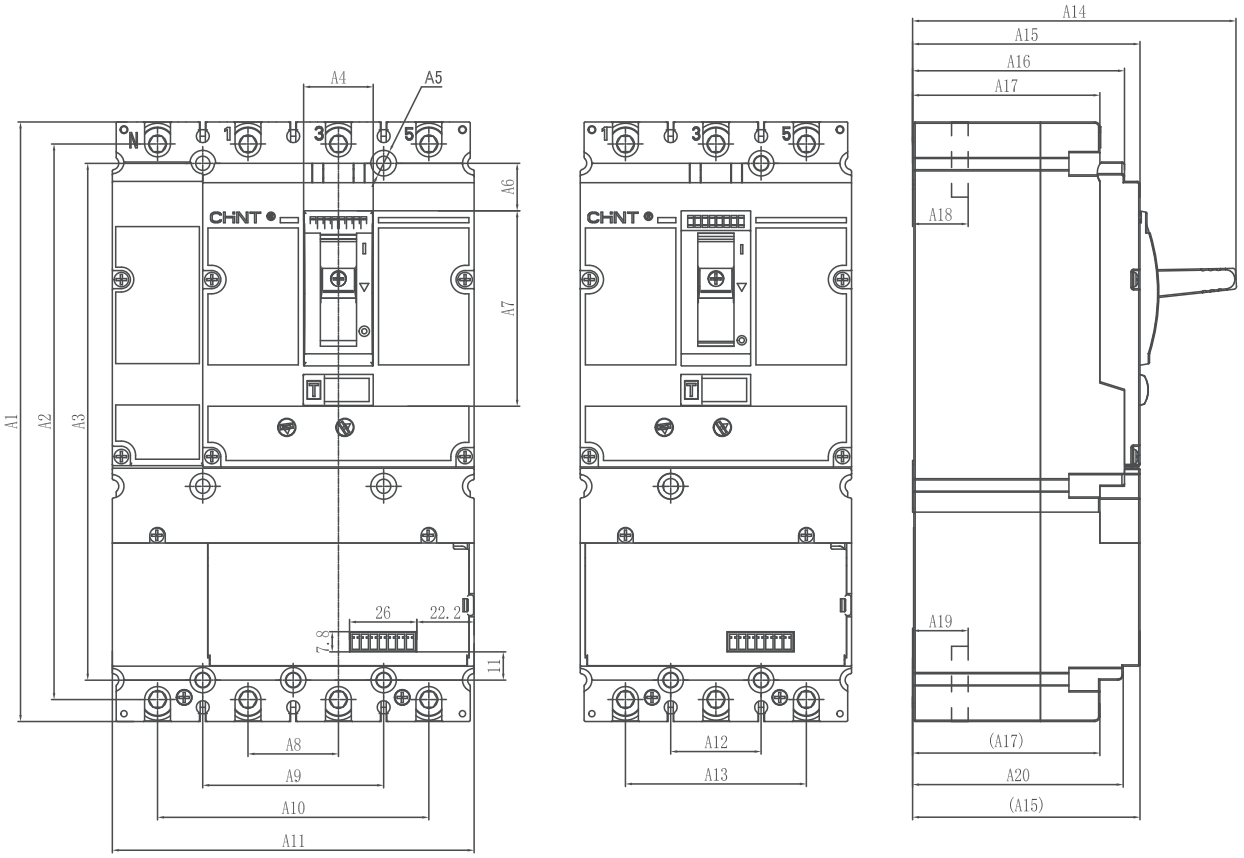
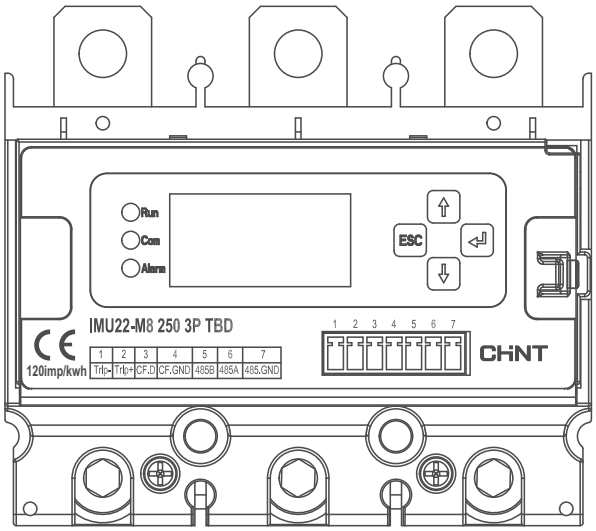


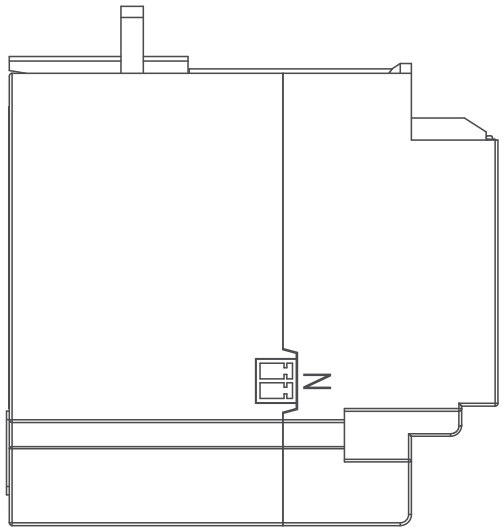
Table 2 Outline and Installation Sizes Unit (mm)

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
IMU22-M8/3P	232	215	200	27	4xϕ5.5	18.8	75.3	–	–	–
IMU22-M8/4P					7xϕ5.5			35	70	105
IMU23-M8/3P	355	327	301	51.8	6xϕ5.5	27.5	114	–	–	–
IMU23-M8/4P					9xϕ5.5			45	90	135
	A11	**A12**	**A13**	**A14**	**A15**	**A16**	**A17**	**A18**	**A19**	**A20**
IMU22-M8/3P	105	35	70	125	88	82	72.5	22.5	22.5	81.5
IMU22-M8/4P	140	–	–							
IMU23-M8/3P	140	45	90	171	113	108	96	27	27	106
IMU23-M8/4P	185	–	–							

9 Introduction to terminal blocks:



Front



Side

The left side 2PIN terminals (either pin, interval distance is 3.5mm) are N pole of TT or TN system, and the IT system has no terminal interface.

The interval of 7 PIN at front side is 3.5mm

Table3 description of 7PIN

Terminal No.	Terminal Code	Terminal Function
1	Trip-	Flux negative
2	Trip+	Flux positive
3	CF.D	Active energy pulse
4	CF.GND	Active energy pulse GND
5	485B	Communication interface: 485B
6	485A	Communication interface: 485A
7	485.GND	Communication interface: GND

Remarks:

1. IMU-M8 is applicable to the power grid with 50Hz and rated voltage of 415V and below.
2. For TT or TN system, the N line on the secondary terminal of 3P product must be connected in order to work normally.
3. The working temperature is -25℃ ~ + 70℃, the average value of working temperature with 24 h shall not exceed + 35 ℃, and the storage temperature is - 40℃ ~ + 70℃.

10 Communication Protocol

See Annex (IMU-M8 Communication Protocol)

11 Fault Analysis and Troubleshooting

Table 4 Fault Analysis and Troubleshooting

Fault Phenomenon	Cause Analysis	Troubleshooting Method
Operation Indicator (Green) does not flash	If is the connected Circuit Breaker closed?	Circuit Breaker closing
Communication Indicator (Yellow) is OFF.	RS485 communication line is connected reversely or has poor contact.	Reconnect the RS485 cable
The Fault Indicator (Red) is ON.	Read the fault status information and troubleshoot.	Troubleshooting

12 Warranty Period

12.1 Warranty Period

Under the normal storage & transportation conditions and the Product packaging or the Product itself is intact, the Warranty Period of IMU-M8 Series Intelligent Measuring Unit is 24 months from the date of production.

The following conditions are not covered by the Warranty:

1) Damage caused by improper use, storage and maintenance of User/s.
2) Damage caused by organization/s or personnel not designated by the Company, or User her/himself disassembly and maintenance.
3) The Product exceeds the Warranty Period.
4) Damage caused by force majeure.

12.2 Environmental Protection

In order to protect the environment, when this Product or its part/s is/are scrapped, please properly dispose of it/them as industrial waste; Or to the recycling station for classified disassembly, recycling and reuse according to relevant national regulations.

CHINT

QC PASS

IMU-M8

Intelligent Measuring Unit

This Product has passed the inspection and meets the Standards of IEC61557-12 / IEC61326-1/IEC61010-1. This Product is allowed to leave the Factory.

PD1 Inspector 30

Test date: Please see the packing

ZHEJIANG CHINT ELECTRICS CO., LTD.