



# HEXING

# Installation Manual

# Three Phase Energy Meter

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**For HXE310 CT & CTPT Meter**

**Hexing Electrical Co., Ltd.**  
**[www.hxgroup.cn](http://www.hxgroup.cn)**

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## Introduction

### Range of validity

The present installation manual applies to the meter specified on the title page.

### Purpose

The installation manual contains all the information required for application of the meters for installation and maintenance.

### Target group

The contents of this installation manual are intended for qualified personnel of energy supply companies responsible for installation and maintenance of the meter.

**Hexing Electrical reserves the right of final interpretation**



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## 1 General view



Figure 1.1 View of HXE310 Smart Meter (for reference)

### Front View

The meter information is printed on front cover and front door. The information could be printed according to requirements of Power Supply Company. There is a button for data query and manual disconnector control, an optical communication interface for HHU operation and local maintenance.

### Field of application

The meter is for LV or HV three-phase user. The rated voltage is  $3 \times 57.7 \sim 3 \times 230\text{V}$  and the maximum current can be 10A.

### Characteristics

- Liquid crystal display(LCD)
- Protection class II
- IP 54
- Optical communication
- RS-485 communication
- Pluggable remote communication module
- With 5A disconnector
- With battery, supporting power off display
- The meter has security display mode
- With relay output to control

## 2 Installation

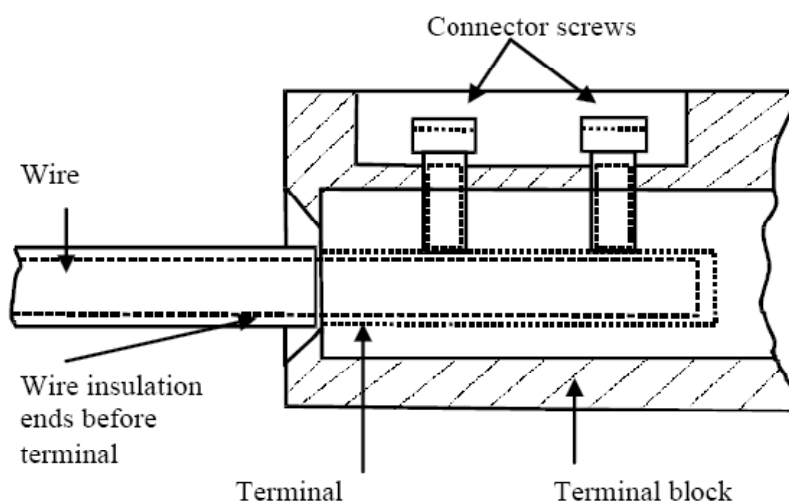
### 2.1 Installation Requirements

The requirements for the installation site are as following:

- 1) The site conditions should be within the protection class (IP54) of the meter.
- 2) The temperature of air and contact surface is in the operating temperature range (-30°C~+70°C).
- 3) There must be no harmful and corrosive air.
- 4) The electricity network is 3\*57.7~3×230V 50/60Hz The maximum current is 10A.
- 5) The limit of the electricity network phase voltage is 276V.
- 6) The ambient magnetic field strength is lower than 0.5mT.

### 2.2 Installation Sequence

- 1) Check the meter for any visible damage caused by shipping. If there is visible damage, please change the meter.
- 2) Switch off the voltage.
- 3) Remove the terminal block cover.
- 4) Fix the meter through suspension hanger and other installation points.(See chapter 6. Installation dimension)
- 5) Make the required wiring carefully according to the connection diagram, which is located on the terminal block cover.
- 6) Strip the wires so that the stripped part of the wire is long enough to reach under both connector screws. Make sure the wire insulation ends before the terminal. The insulation, however, must reach the inside of the terminal block, so that it can not be touched.



- 7) Screw all connections tight, but be careful not to break the screws. Recommended torque is 3 Nm for size M6.
- 8) Make relevant connections.

Relay	20	21
RS-485	17(A)	18(B)
Pulse	13	15

Check whether the connection is correct according to chapter 5 connection diagram.

- 9) Switch on the voltage.
- 10) Test whether RS-485 connectors are connected correctly.
- 11) Test whether relay connectors are connected correctly.
- 12) Switch off the voltage.
- 13) Attach the terminal block cover and seal it.
- 14) Switch on the voltage.
- 15) Check whether there is S7 indicator on LCD( If there is S7, the meter cover open is detected or there is strong magnetic field. Please check the status of meter cover and magnetic field).
- 16) Clear alarms by Hand Held Unit(HHU).
- 17) Record the serial number on the nameplate for backing up the user and installation position.

## 2.3 Clear alarms

It is aim to clear the meter cover open alarms during the installation process. The method is as following:

- 1) Connect the HHU and the meter through the optical probe
- 2) Execute an alarm clearance command using HHU.
- 3) Check whether the meter cover open alarm is cleared successfully.( The Alarm indicator is on when there is meter cover open alarm. The Alarm indicator is off or flashes if the alarm is cleared successfully. For details, see Chapter 8 nameplate and LED indicator)
- 4) If the meter cover open alarm is not cleared successfully, then check whether the terminal block cover is attached correctly. Repeat step 2 and 3.

## 3 Maintenance

### 3.1 Replace battery

In the lifespan of the battery, some reasons may result in little part of batteries are run out ahead of time and damage, such as the meter are stored in warehouse for a too long time, or the temperature of the application site is too high. When the battery needs to be replaced, the indicator will flash on the LCD. The message will be sent to the master station through alarm register. The battery could work for another week from the alarm is given to it is totally run out of use. Steps to replace battery are as following:

- 1) Remove the seal on the front cover.
- 2) Open the front cover.
- 3) Replace the battery with a new one.
- 4) Press the display button, and switch to the battery voltage interface. The circumstance is normal if the current battery voltage is in 3.4V~3.7V. Otherwise, there is problem with

- the new battery.
- 5) Close the front cover.
- 6) Use HHU to execute the command of setting battery remaining capacity, and make the meter to recalculate current remaining capacity of the battery as 99% remaining capacity.
- 7) Set meter time using HHU.
- 8) Execute the clear alarm command using HHU. The alarms for low battery and meter cover open will disappear.( See 2.5 clear alarm)
- 9) Seal the front cover again.

**NOTE**

The safety of operation people could not be guaranteed if liquid enters the meter during battery replacement process. The operation people could execute switching off the voltage before step (3) and switching on the voltage after step (3). It is not suitable to replace battery in rainy time.

## 4 Mechanical Structure

### 4.1 Case

The internal construction of the meter is not described here, as meter protected by manufacturer seal. The meter couldn't be opened after delivery. The front door is only secured by a plastic seal and can be opened to operate the button, to change the battery.

The following drawing shows the meter components visible from outside.

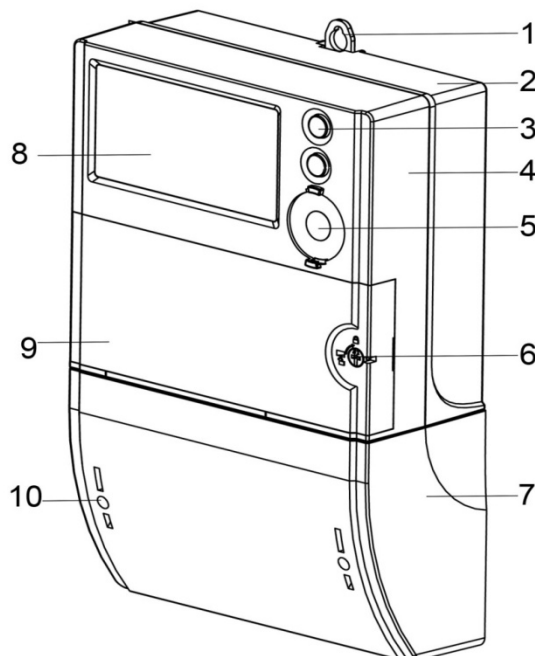


Fig 4.1.1 Front view of HXE310

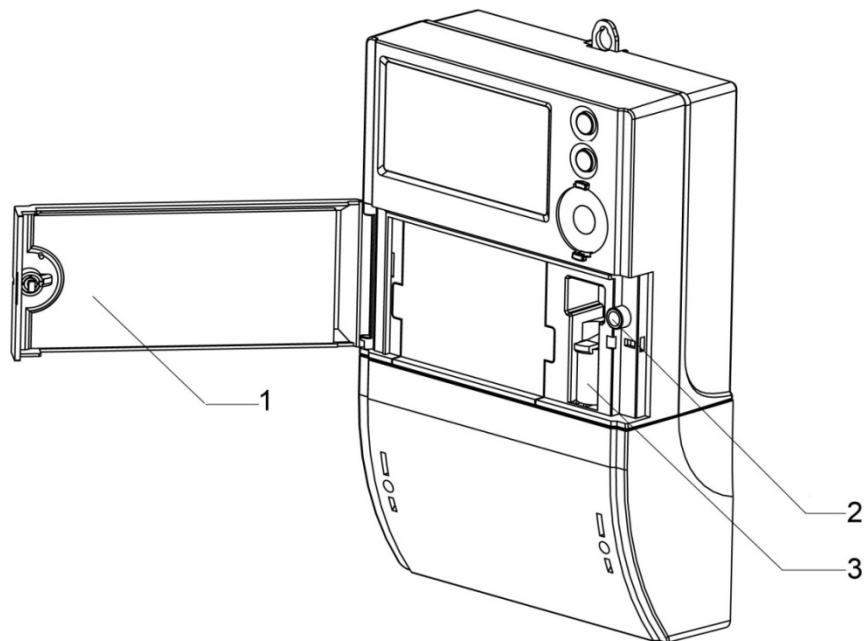
1 Suspension hanger

2 Lower part of case



- 3 Display button
- 4 Upper part of case
- 5 Optical interface
- 6 Screw with manufacture seal
- 7 Terminal cover
- 8 Liquid crystal display (LCD)
- 9 Front cover
- 10 Company seal

The front door must be opened to access to the battery compartment and front door open detection button.



*Fig 3.1.2 Meter with front cover open*

- 1. *Front cover*
- 2. *Button detecting front door open*
- 3. *Battery compartment*

## 4.2 Connections

The terminal block with the meter connections is situated under the terminal cover. Two company seals in the fixing screw of the terminal cover prevent unauthorized access to the phase connections and therefore to unrecorded current consumption.



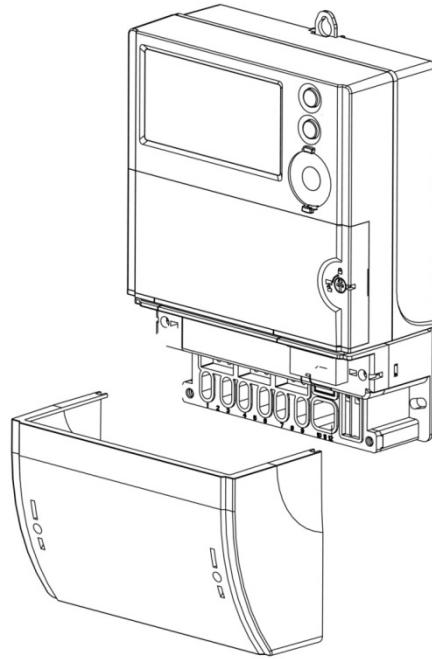


Fig.4.2.1 Meter with terminal cover removed

## 5 Connection Diagram

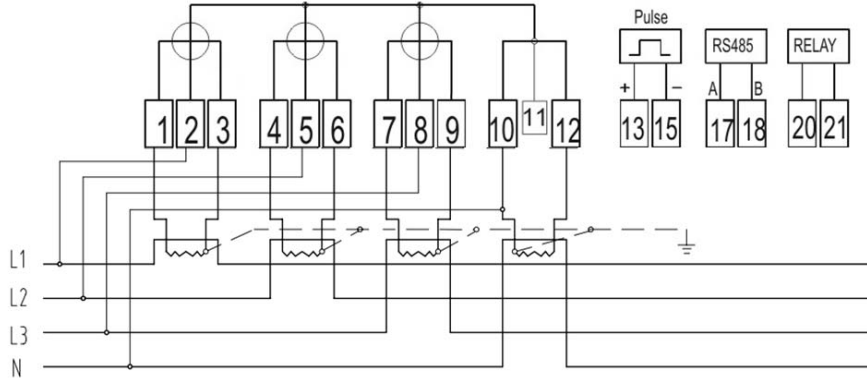


Fig 5.1 CT connection

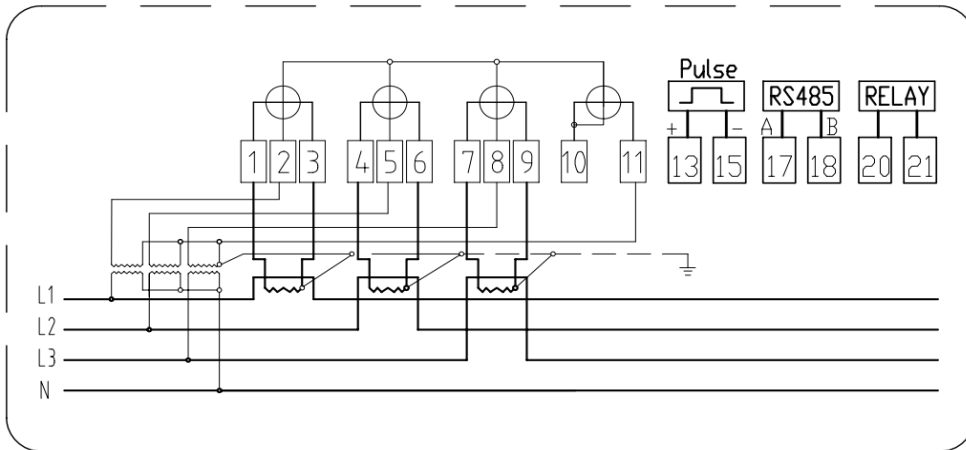
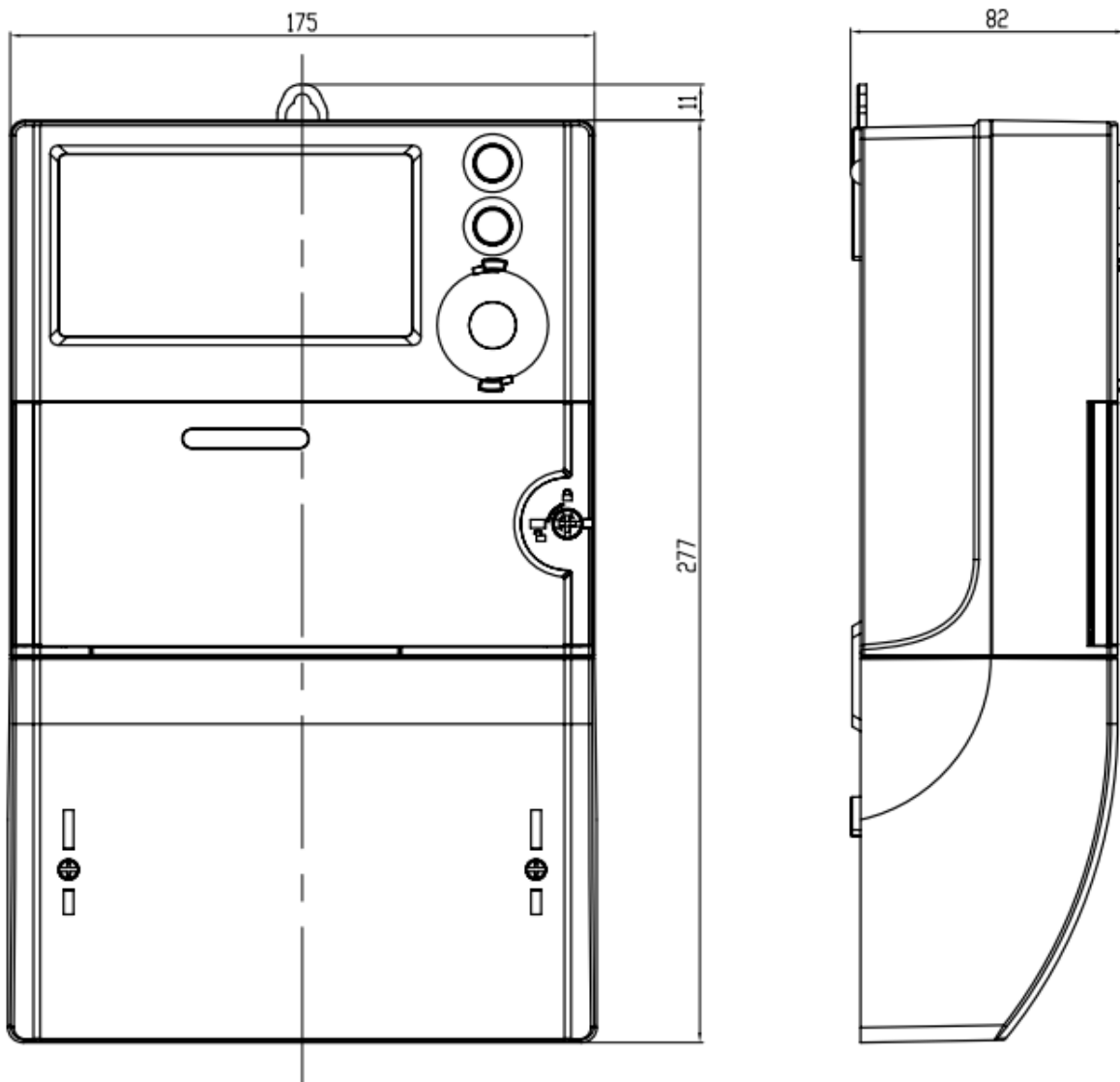


Fig 5.2 CT/PT connection

## 6 Dimension



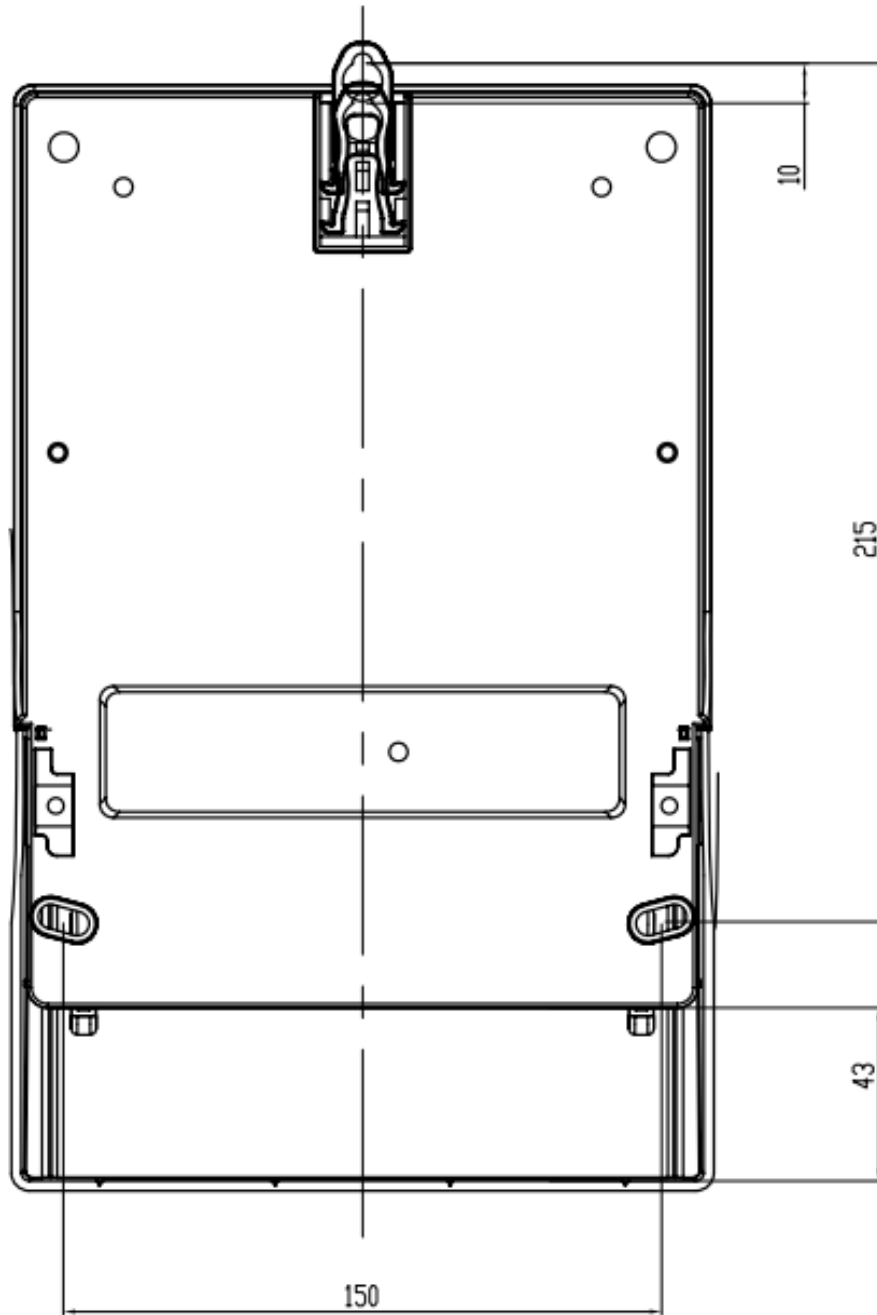


Fig 6.1 Meter dimensions

- Width-----175 mm
- Height -----277 mm
- Depth -----86 mm
- Terminal cover-----35 mm free space

## 7 LCD Display

Meter has a LCD display with following size and layout:



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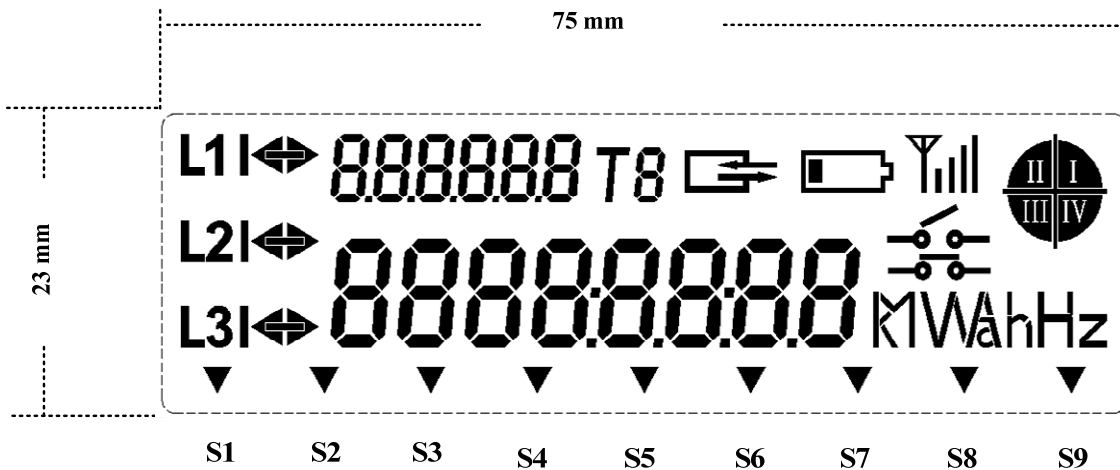


Fig 7.1.1 Size and layout of LCD

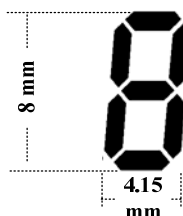


Fig 7.1.2 Size of each digit

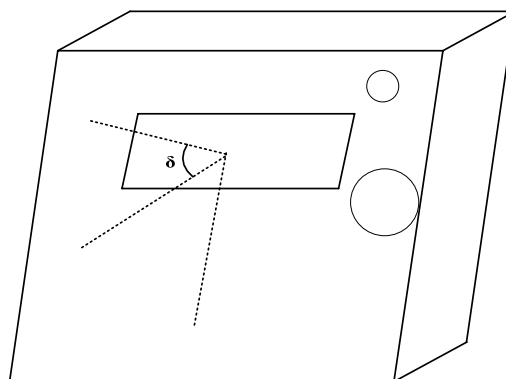


Fig 7.1.3 Diagram of view angle

- Meter has a clear visibility with a range of view angle of  $\delta \leq 45^\circ$  right down the LCD within one meter.
- Backlight display, when backlight is opened, it will have a better visibility.

**OBIS:**

- When the meter displays import active energy, the current display will be 1.8.0 . Letters are right aligned.

**Current tariff No.**

- If Tariff 1 is the current tariff, the display will be T1.

**Communication indicator**

- If the meter is using optical communication or RS-485 communication, the



communication indicator will flash with a frequency of 1Hz.

**Voltage indicator**

- **L1 L2 L3** indicating the working status of phase voltage, and it is corresponding to A, B,C. If voltage is normal, it will be full display; if voltage is abnormal like over-voltage, low-voltage, it will be flashing display; and if the voltage is lower than 20% of rated voltage, it will be no display.

**Power direction indicator**

- The arrow is right when the meter imports energy from power network. The arrow is left when the meter exports energy to power network. If there is no current, the indicator will not be showed. (if the voltage is lower than 20% of rated voltage, it will be no display. )

**Battery condition**

- The indicator will flash with 1Hz frequency when the voltage of battery is low or battery life is almost over. The flash will disappear after the battery is replaced.

**GPRS signal indicator**

- The indicator shows the GPRS signal degree. (The current meter doesn't use this indicator)

**Value field**

- 
- Up to 8-digit indices are displayed.

**Disconnecter status**

- The indicator shows the current physical status of disconnecter.

**Unit field**

- **kVAhHz** Different units can be shown: kWh, Hz, etc.

**Quadrant indicator**

- indicating current total working quadrant of three phase(to indicate total working status of the current working quadrants, judging from the algebraic sum of the active and reactive power and status)

**Other indicators**



- S1: Flashing indicates the cover open event(if in the factory mode, it indicates battery cover open)
- S2: The meter is in button display mode or called ALT display mode
- S3: The meter is in the TEST display mode.( if in the factory mode, it indicates meter cover open)
- S4: The carrier is successfully registered.( if in the factory mode, it indicates terminal cover open)
- S5: The auxiliary relay is disconnected now(if has this function)
- S6: The disconnecter could be connected by pressing button manually.
- S7: Meter cover is open now; reverse phase occurs or there is magnetic field which is over 0.5mT. it is used for inspections of installation
- S8: EOI indicating output
- S9: The meter is in DST

## 8 Nameplate

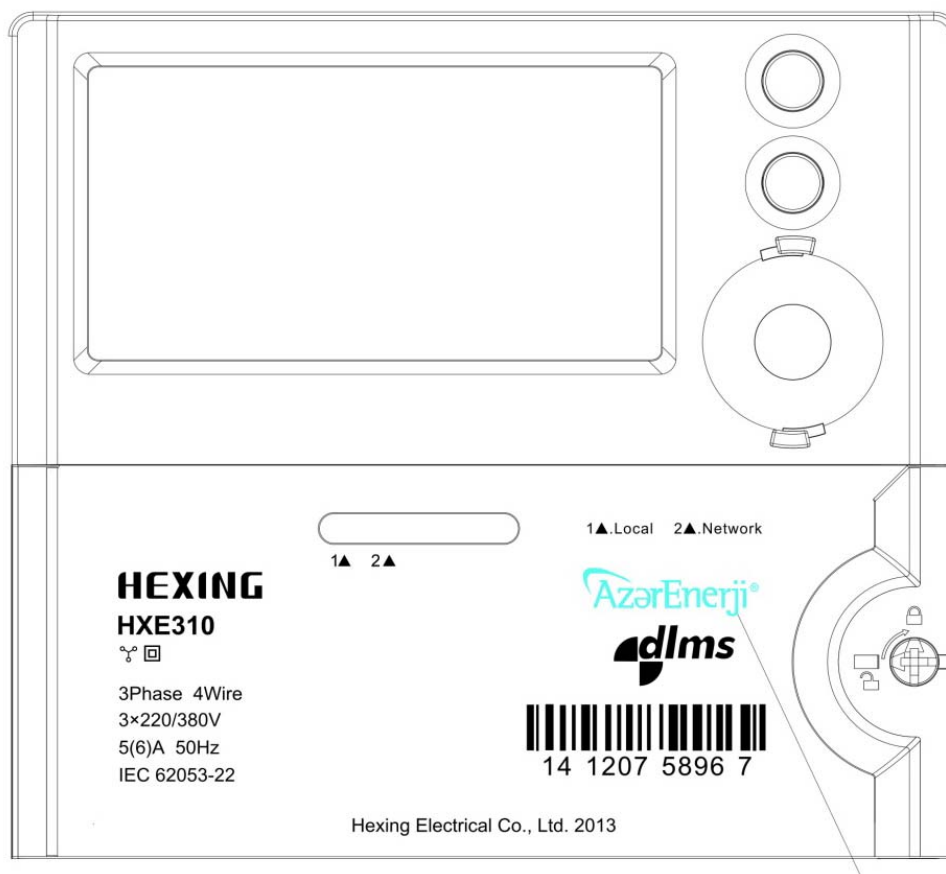


Fig 8.1 CT meter

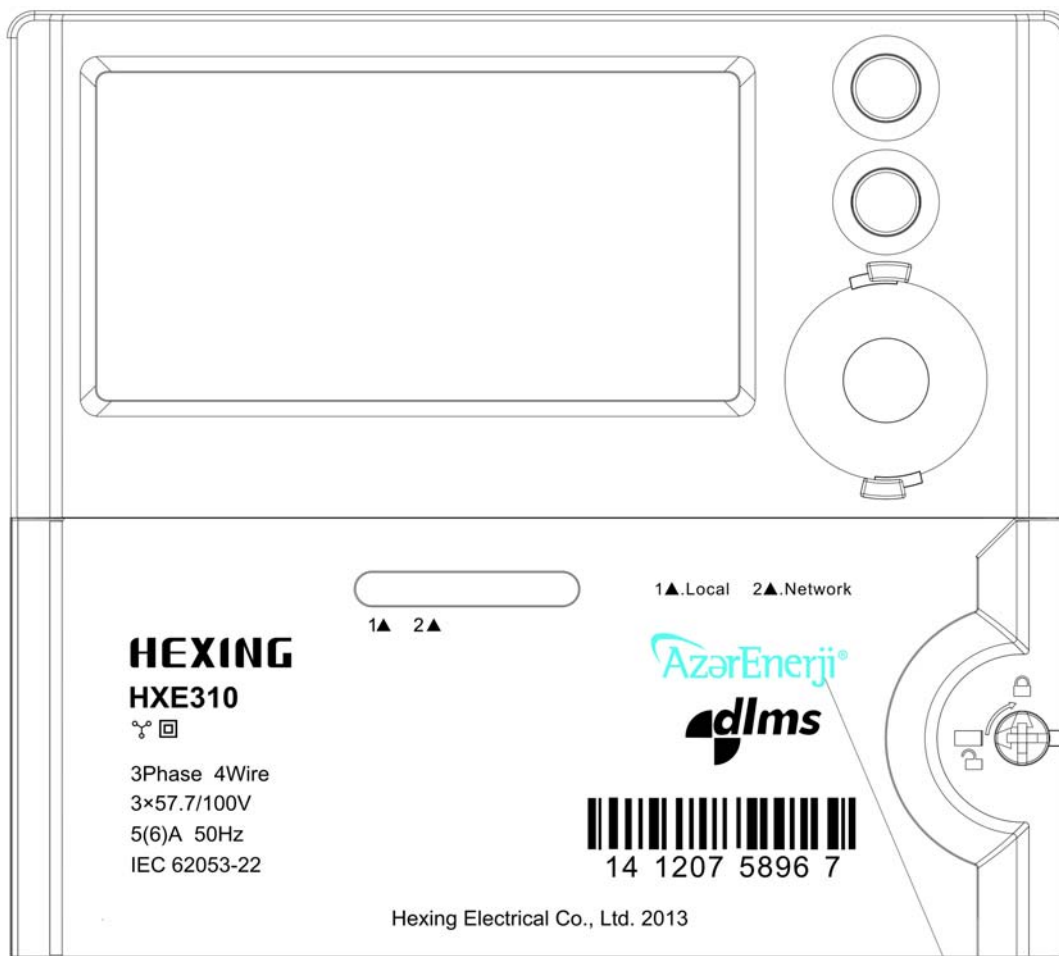


Fig 8.2 CTPT meter

## 9 Technical specification

Description	Value
<b>Voltage</b>	
Nominal voltage Un	3x57.7V/230V
Extended operating voltage range	80%~120% Un
Start operating voltage	40V
Limiting voltage	70V
<b>Frequency</b>	
Nominal frequency fn	50Hz
tolerance	45 to 55 Hz
<b>Current</b>	
Basic current (Ib)	5A
Maximum current (Imax)	6A
starting current (Ist)	5mA
<b>Measurement Accuracy</b>	
Active energy	Class 0.5S
Reactive energy	Class 2
<b>Power Consumption</b>	
Power consumption in Voltage circuit	
active power without module	<2W
apparent power without module	<10VA
Power consumption in current circuit	
apparent power without module	<4VA
<b>Environmental Influences</b>	
Temperature range	
operation display	-25℃ to +70℃
operation meter	-40℃ to +70℃
storage	-40℃ to +85℃
<b>Electromagnetic Compatibility</b>	
Electrostatic discharges	
contact discharge	8kV
Electromagnetic RF fields	
27MHz to 500 MHz	typical 10V/m
100kHz to 1 GHz	typical 30V/m
Fast transient burst test	normally 4kV

Description	Value
<b>Insulation strength</b>	
AC voltage test	
insulation strength	4kV at 50Hz 1 min
Impulse voltage strength	
impulse voltage 1.2/50µs mains connections	8kV
Protection class II	
<b>Display</b>	
Display type	LCD (liquid crystal display)
number of digits value field	Up to 8
digit size	4.2x8mm
<b>Inputs and outputs</b>	
Optical test outputs active energy & reactive energy	
type	red LED
pulse width	30ms
active energy constant	10000 imp/kWh
reactive energy constant	10000 imp/kvarh
<b>Communication Interface</b>	
Optical interface	
communication standards	IEC62056-21 E mode
baud rate	300bps for standby 9600bps for communication
Plug-in interface	
for different communication medium	
include GPRS/ PLC	
RS-485 interface	
Communication standards	DLMS HDLC
Baud rate	1200~9600 bps(configurable)







**NOTE:** Information in this document is subject to change without notice. The information is accurate at the time of printing (March, 2013) © Hexing Electrical



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