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Globe Engrgy Meter Calibration Expert

KAIPU

KP-S1000 SINGLE PHASE CALIBRATE TEST BENCH

SPECIFICATION

ISO/IEC17025:2005

The offered system from KAIPU is fully compliant with the IEC 60736 standard and is suitable for testing meters according to the following standards:

• IEC 62052-11 and IEC 62053-11, -21, -22, -23, -24

• EN 50470-1, EN 50470-2, EN-50470-3 (standards harmonized with Measuring Instrument Directive 2014/32/EC)

We build accredited laboratory holding IEC EN ISO 17025 FOR TESTING AND CALIBRATION

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1. Introduction

KP-S1000 Single phase energy meter test bench is a new generation, high precision energy meter calibration equipment. It uses the advanced technology and electronic components available in 90 decade . The test bench can be operated from embedded keyboard or operated from PC software.

2. Feature and function

1. Accuracy class: 0.1% or 0.05% for energy meter from 100mA to 120A

2. KP-1100 Reference meter 0.1% or 0.05%

3.Current: 1mA -120A (0.01A,0.1A, 0.25A, 0.5A, 1A, 2.5A, 5A, 10A, 20A, 50A, 100A)
   With 120% Scope ,output 120A Maximum.

4. Meter Calibration , Meter value adjustment , Use MOXA CARD or Serial SERVER.
   Communication port by RS232 or RS485 , Protocol will supply to user.

5. Automatic calibration and test by PC software.

The Standard test function :

1.Accuracy test in all four quadrants (active, reactive and apparent energy)

2.No-load test (creep test)

3.Starting current test

4. Register test (dial test)

5. Meter constant test

6. Pulse input and output test

7. Influence quantity test (voltage, frequency, harmonic distortion, etc.)

8 . Phase rotation test

9. Warm up test

10. Disconnect Neutral test

3. Technical specification

Power supply: 220V+10％, 50Hz/60Hz

Maximum power consumption: 1000VA (reference for 24 positions)

Phantom load power source Technical specification

Voltage output: 1x 30V (AC) – 1 x 300V (AC);

Resolving power: 0.01％ of current range

Current output: 0.001A (AC) – 100A (AC)

Resolving power: 0.01％ of current range (min 0.0001A)

Phase shift range: 0-360°

Resolving power: 0.1°

Frequency output: 45Hz – 65Hz

Resolving power: 0.01Hz

Waveform distortion (sine wave output):

voltage < 0.5％ current < 0.5％

Stability of power source (sine wave output): < 0.1％ (180s)

Load can be resistance / inductor or capacitance(<4uF)

Output waveform: sine waveform

Output capacity:

Voltage source: 300VA-1500VA(dependent on meter positions)

Current source: 300VA-2500VA(dependent on meter positions)

4. Reference meter Technical specification

Type:KP-1100 single phase reference meter,or HY5101, HDS122-02 (Optional)

Power supply: 220V +10％, 50Hz/60Hz

Maximum power consumption: 20VA

Measurement range:

Voltage: 60V (AC) - 280V (AC)

Current: 0A (AC) - 100.0 (AC)

Accuracy: 0.02％ / 0.05％ / 0.1％ Optional

Warming up: 1 mins

Working environment:

Temperature: + 5℃～ + 40℃

Relative humidity<85％

Dimensions: 480mm X 420mm X 140mm

Weight: 2.0kg
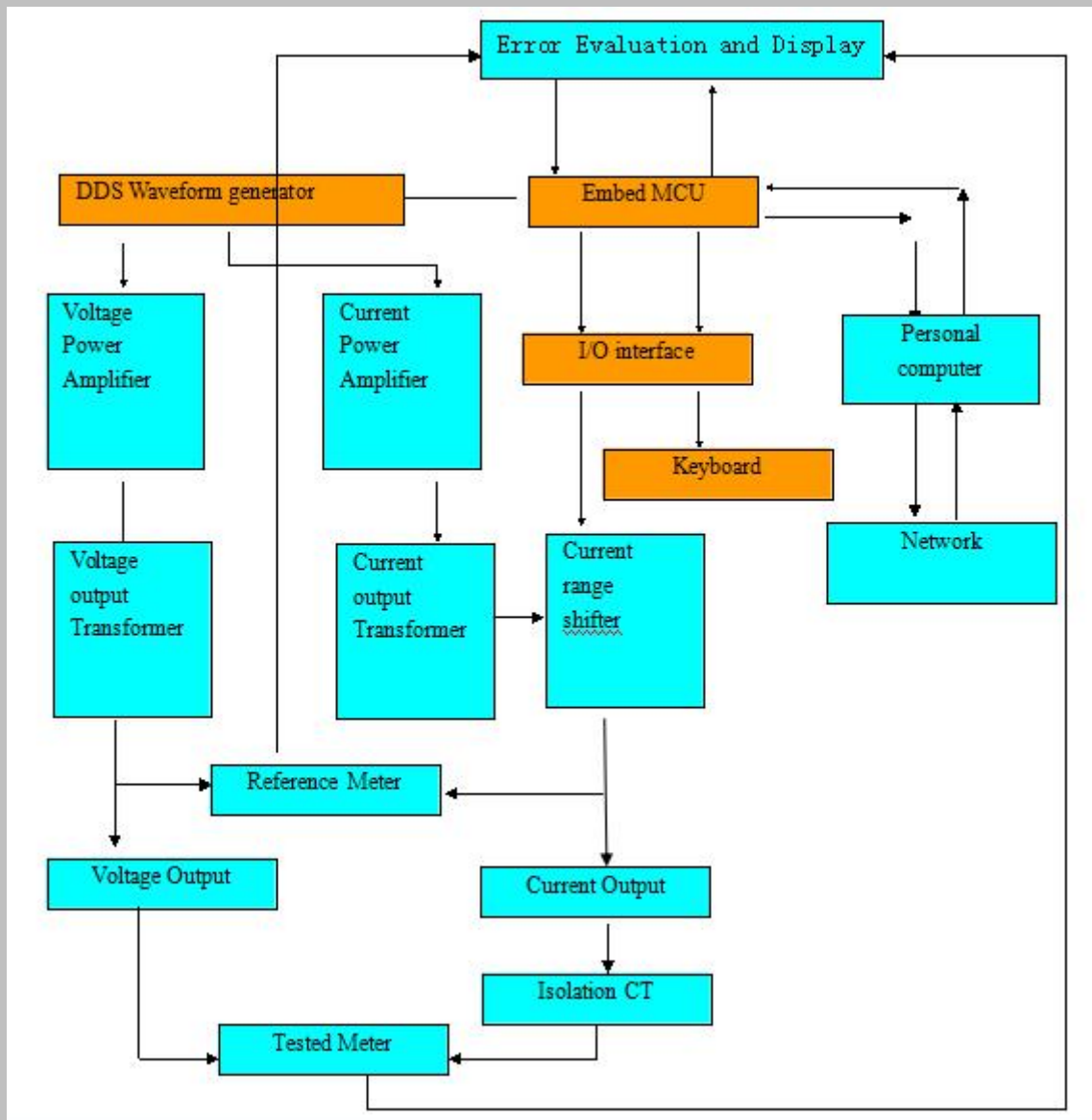
5.Error Calculator Technical specification

Impulse of tested meter could be: TTL / OC / Optical head

Max. frequency of impulse could be: 200Hz

Error display range: 0.001％-99.99％

Working principle and frame

Introduction:

1)Signal generator

The [🟧] marked frame is included in signal generator box. Signal generator is equipped with DDS waveform technology (digital frequency modulation, amplitude modulation and phase modulation). Embedded MCU is the brain of signal generator, also it is the brain of test bench, signal generator generate high stability sine waveform which is send to voltage amplifier and current amplifier.

2) Power amplifier

Power amplifier features stability and reliability with the PWM amplify technology and well-designed protection when output voltage shortcut or   output current circuit open.

3) Measurement

Error of tested meter is achieved by comparison with the reference meter.

6. Embed software user manual

## 6.1 Definition of Keyboard and Symbol of Display Unit

Key define:

F1:   Starting UP test

F2:   No load test

F3:   No definition yet

5% ~ 600% ,Imax, 0.5Imax: Load select

UI: Output U&I

0 ~9:   Number

0.5L, 0.8L, 1.0, 0.8C, 0.5C: Power Factor

.   :   Decimal

ABC、A、B、C :   Phase Select

↑↓:   up/down or Increase/decrease current/voltage

⬅| :   Enter key

Set: tested meter's parameter

6.2 Initial screen

Turn on power for equipment, the first screen will display as below:
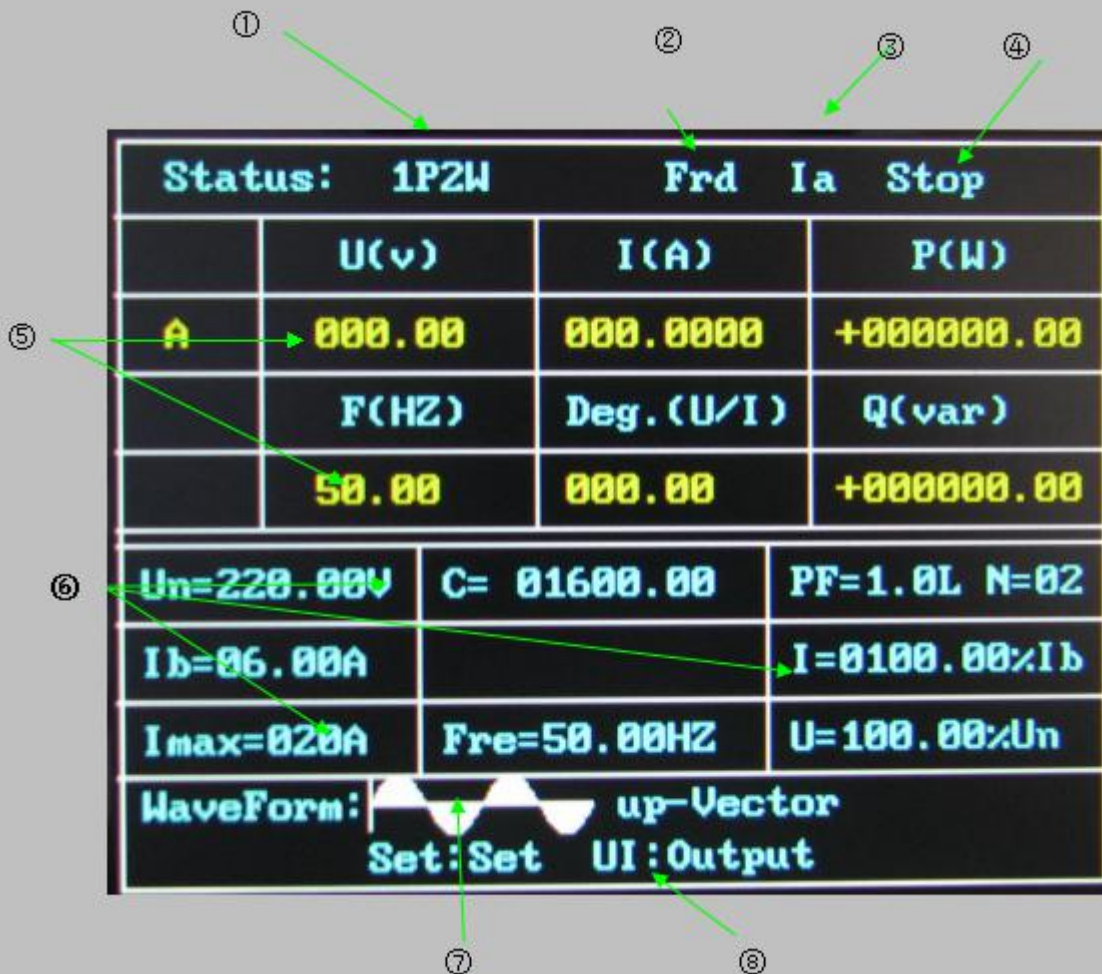
①Tested meter's model
②Current Status
[Frd: abbr.   Forward ; Rev: abbr.   Reverse]
③Output or Stop indication
④Error information
[BZBErr: communication error with reference meter
800Err: communication error with error calculator]
⑤ Output value
⑥ Tested meter's parameter and output parameter
⑦ Output waveform   ⑧ Help information

6.4 Tested Meter's Parameters And System Parameters
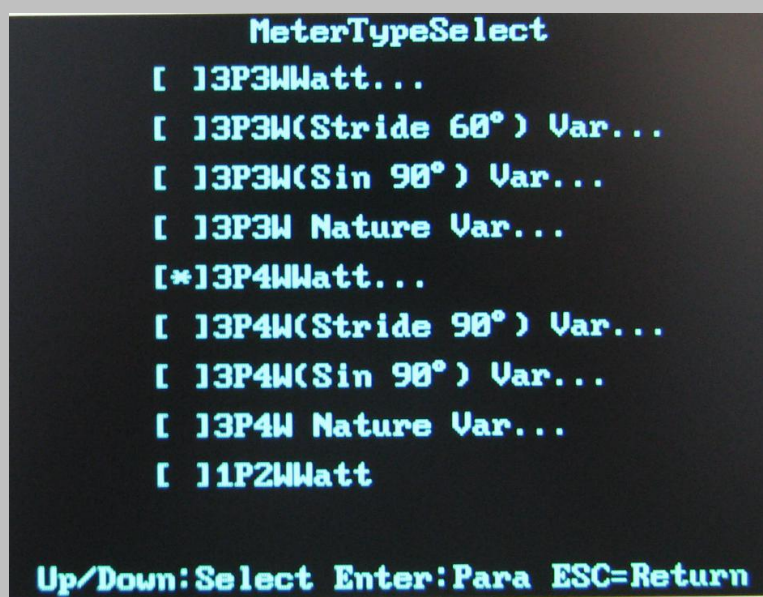
6.4.1 Parameter menu :

Press 'set' key will enter 'Parameter setting menu' . Parameter setting menu is display as below, select corresponding menu item to set parameters about tested meter or about system.
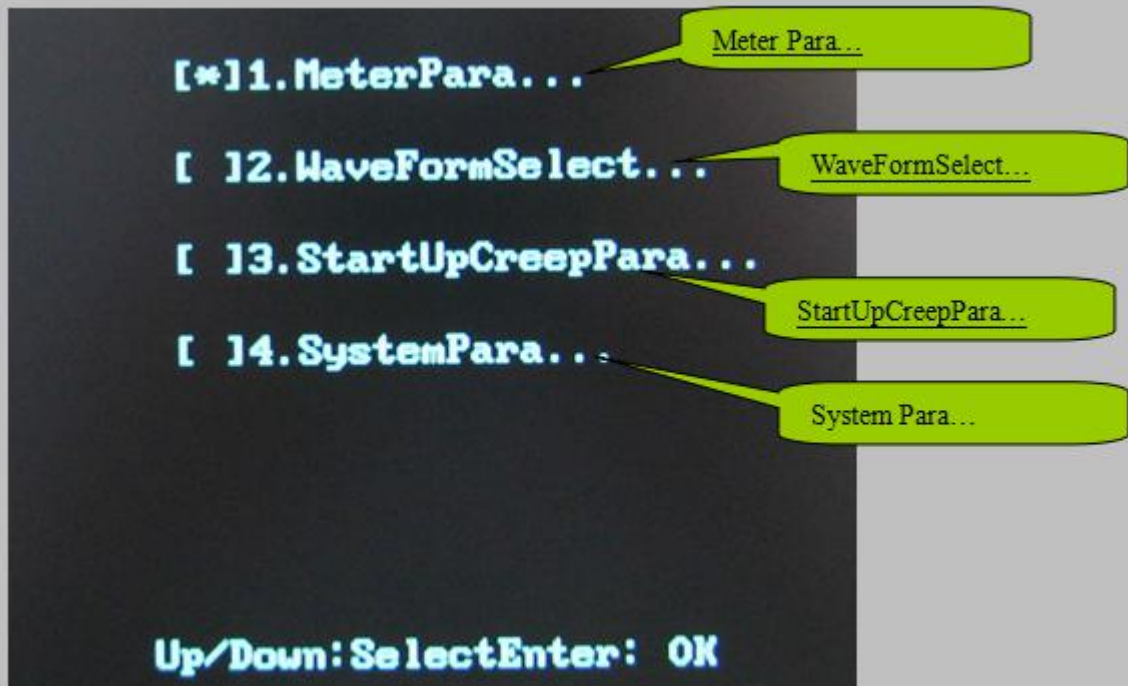
Use number key or ↑ / ↓ key to select menu, Press ESC Key will return to main screen.

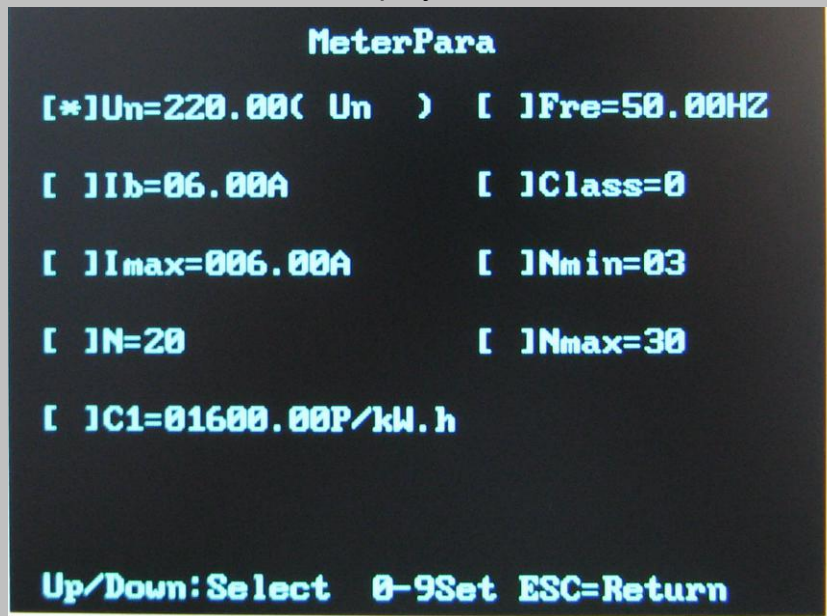### 6.4.2 Select tested meter's model(meter type or meter style)

User can select 'Meter Para…' then press Enter key, LCD will display as below;

In this screen, please select corresponding tested meter's type(style).
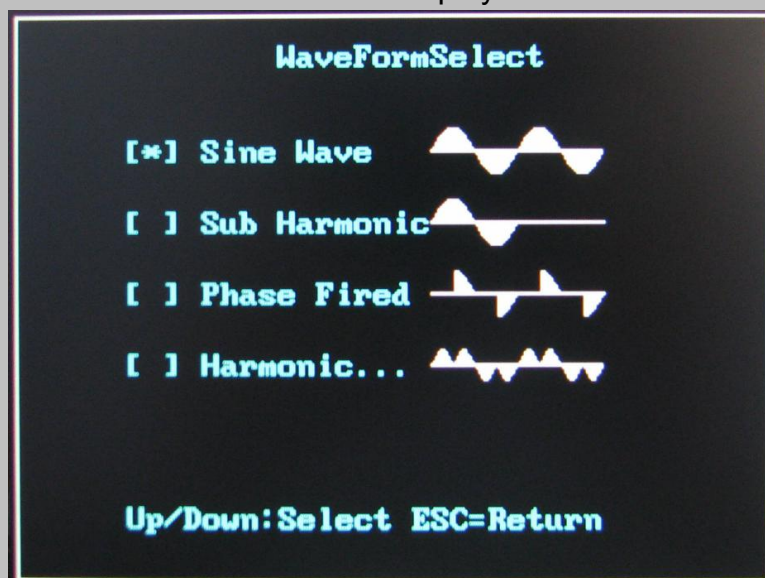
6.4.3   Set Parameters of tested meter[Menu item 1]

Select corresponding meter type(style), Then press key 'SET' or 'Enter' to input tested meter's parameters, the screen will display as below:

```
                    MeterPara

[*]Un=220.00( Un  )   [ ]Fre=50.00HZ

[ ]Ib=06.00A          [ ]Class=0

[ ]Imax=006.00A       [ ]Nmin=03

[ ]N=20               [ ]Nmax=30

[ ]C1=01600.00P/kW.h



Up/Down:Select  0-9Set ESC=Return
```

Use ↑↓ key to select corresponding setting item, press number key or decimal point to proceed setting. Press ↑↓ or press ESC will confirm any input data, press ESC will also confirm any input data and return to previous menu.. The effective frequency should be 45.00Hz – 65.00Hz .   C is the tested meter's constant.   N is the test round when output voltage is 100%Un and output current is 100%Ib, Nmax is the maximum test round and Nmin is minimum test round.

6.4.4   Waveform Parameter[Menu item 2]

Select menu 'WaveformSelect…', Then press key 'SET' or 'Enter' to set Output waveform parameters of the instrument. the screen will display as below:

```
                WaveFormSelect

     [*] Sine Wave      ∿∿

     [ ] Sub Harmonic   ∿__

     [ ] Phase Fired    ⊣_⊢

     [ ] Harmonic...    ∧∧∧∧



        Up/Down:Select ESC=Return
```

Use ↑↓ key to select corresponding Output current waveform, (consult IEC 61036 for output waveform difinition).

6.4.5   Startingup test/no load test parameters[Menu item 3]

Select menu 'StartingupCreep para…', Then press key 'SET' or 'Enter' to set tested meter's Starting up test/no load test parameters, the screen will display as below:
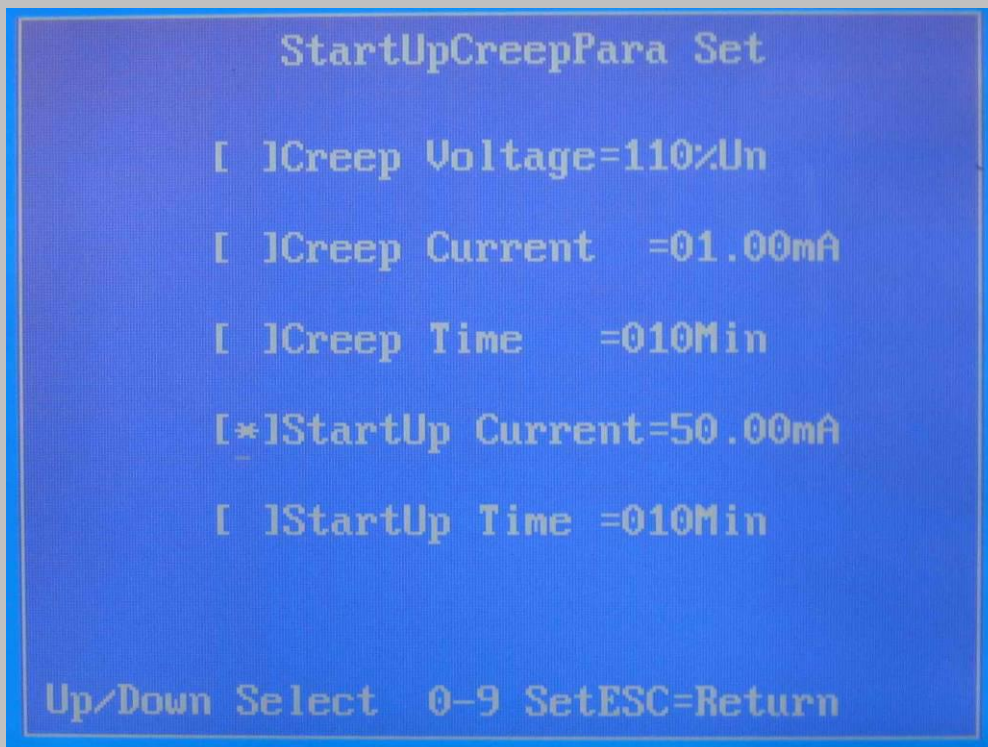
Use ↑↓ key to select corresponding setting item, press number key or decimal point to proceed setting. Press ↑↓ will confirm any input data. Press ESC will also confirm any input data and return to previous menu.

Latent U: It means when no load test, how much voltage should be added on tested meter
Latent I: It means when no load test, how much current should be added on tested meter, usually current is 0.
Latent T: It is the test time of no load test.
Initial I: It means when starting up test, how much current should be added on tested meter.
Initial T: It is the test time of starting up test.

6.4.6   system parameter[Menu item 4]

Select menu 'SystemPara…', Then press key 'SET' or 'Enter' to set parameters about test instrument, these parameter are very important, in order to avoid these parameters being changed easily, user should input a password firstly, the screen will display as below:
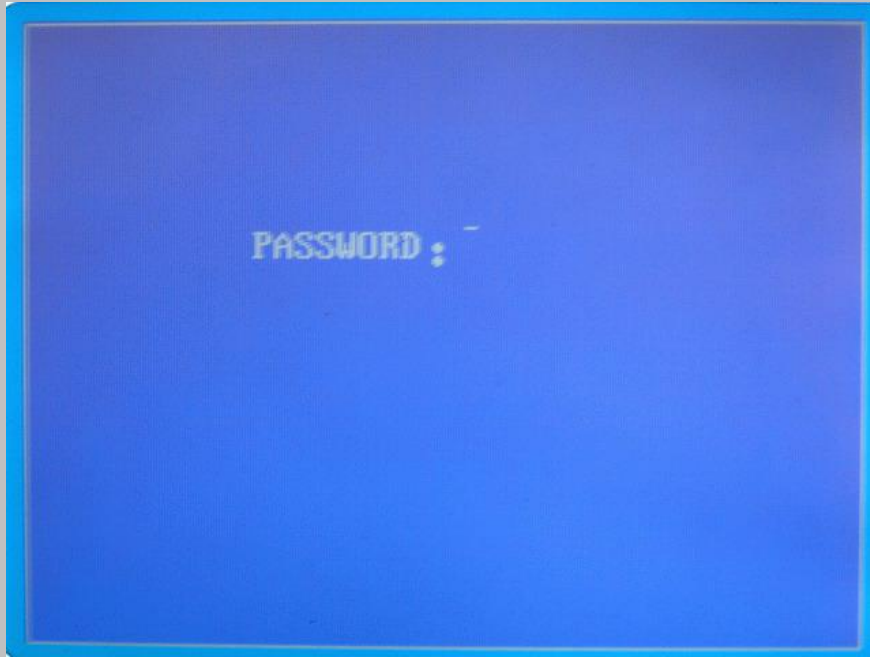
Password of the equipment is "6003". After input password, the screen will display as below:
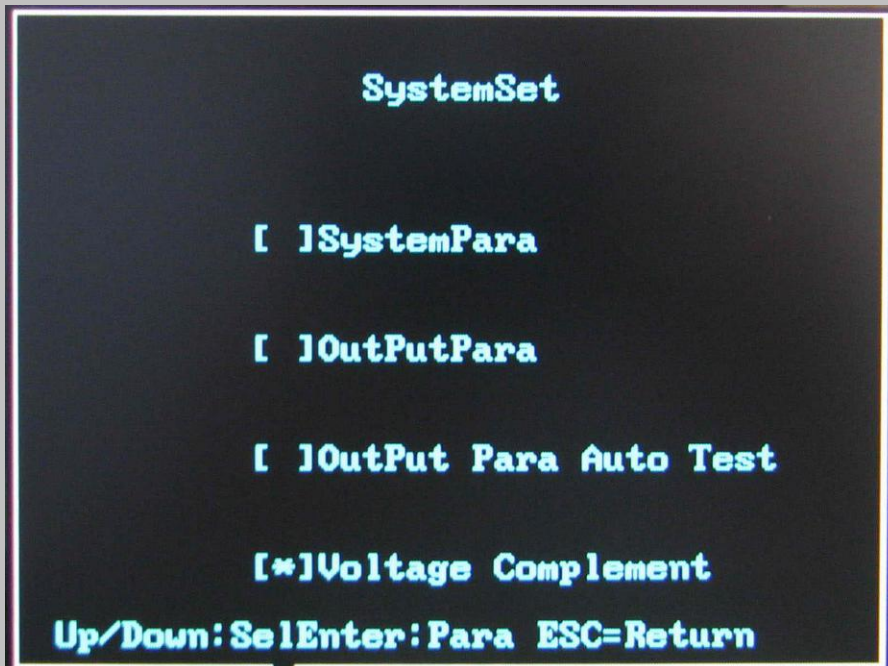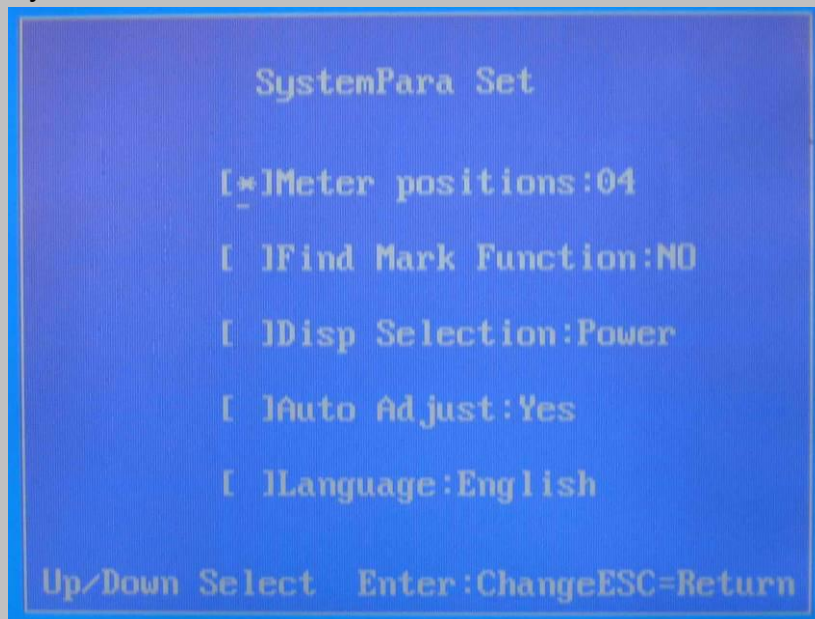
System parameter : System parameter include meter position / display selection and other system parameter.

Output Parameter : Output Parameter include voltage output parameter and current output parameter.

6.4.6.1   System parameter
System parameter include meter position / display selection and other system parameter. Screen will display as below:

Meter positions : meter positions of the test equipment.

Find mark function: when processing starting_up test or no_load test ,if Find mark function is enabled, before processing starting_up test or no_load test, software will process Find mark function firstly.
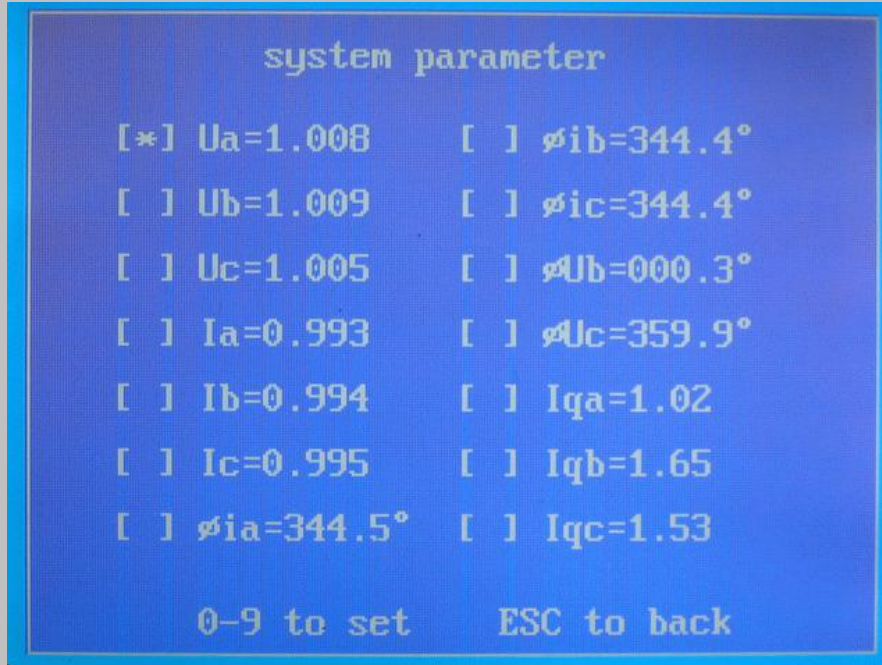
Disp Selection: user can select information displayed on the LCD, if select 'Power', the real output power will displayed on lcd when test equipment output voltage and current. if select 'Phase', the real output angle between voltage and current will displayed on lcd when test equipment output voltage and current.

Auto adjust : when test bench output voltage and current, embedded software will read real output value and real output angle between voltage and current, if the real output value or real output angle is different with the set value and if this function is enabled , embedded software will rectify the output value.

Language : select which language is used of the test equipment.

6.4.6.2 Output Parameter

   Output Parameter : Output Parameter include voltage output parameter and current output parameter, screen will display as below:

```
           system parameter

  [*] Ua=1.008        [ ] Φib=344.4°

  [ ] Ub=1.009        [ ] Φic=344.4°

  [ ] Uc=1.005        [ ] ΦUb=000.3°

  [ ] Ia=0.993        [ ] ΦUc=359.9°

  [ ] Ib=0.994        [ ] Iqa=1.02

  [ ] Ic=0.995        [ ] Iqb=1.65

  [ ] Φia=344.5°      [ ] Iqc=1.53

       0-9 to set    ESC to back
```

Ua,Ub and Uc are amplitude coefficient of voltage output.
[for KP-P1200, only Ua parameter is use]
Ia, Ib and Ic are amplitude coefficient of current output.
[for KP-P1200, only Ia parameter is use]
ΦIa, ΦIb andΦIc is phase coefficient.
[for KP-P1200, only ΦIa   parameter is use]
ΦUb andΦUc is Ub and Uc phase coefficient.
Iqa, Iqb and Iqc is offset coefficient of current output.
(When coefficient being changed, the output value will be changed)

6.4.6.3 Output Parameter Auto Test
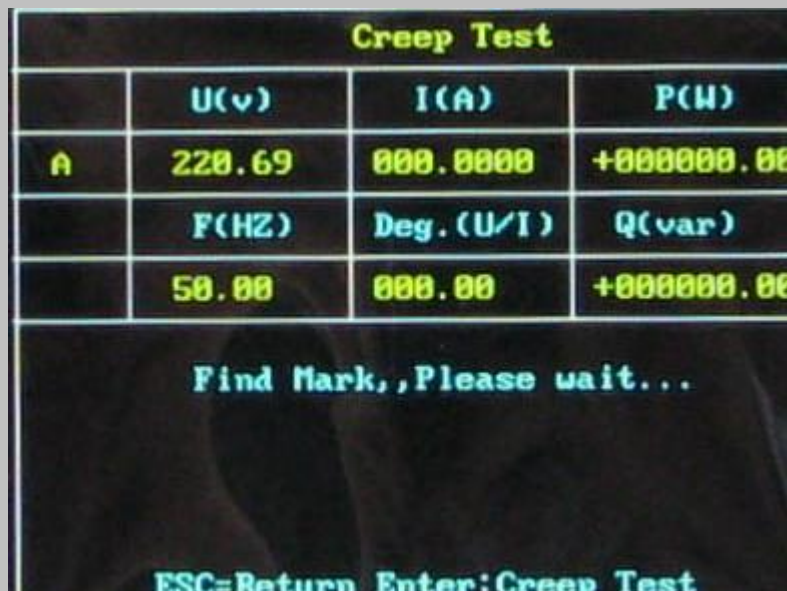
Auto test output compensate parameter.

6.4.6.4 Voltage complement

Set the compensate parameter for 380V / 220V / 100V.
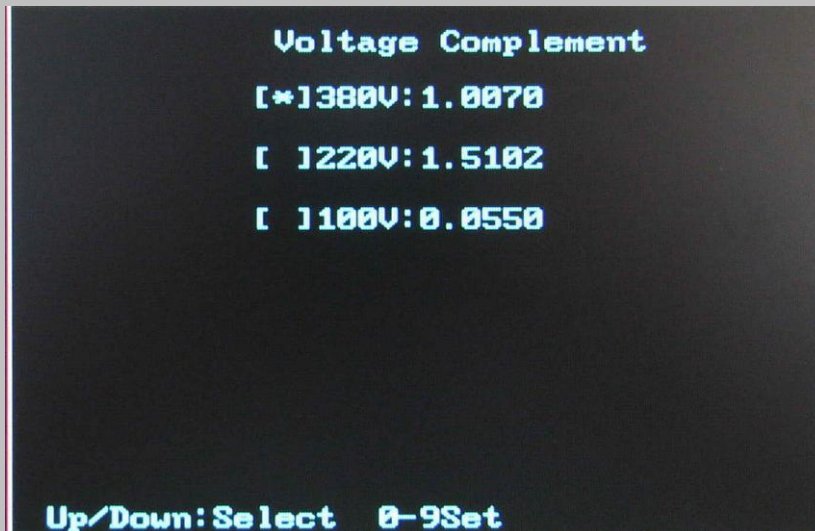
6.5 F1 Function （Starting up test）

Press F1 key software will begin 'Starting up test', LCD screen display as below
(If 'Search mark' function is enabled(in system ParaSet)):

If 'Search mark' function is enabled(in system ParaSet), embedded software will process 'Search mark' function firstly, if 'Search mark' function is disabled, this screen won't display.

If 'Search mark' function is disabled(in system ParaSet), screen display as below

StartUp Test

	U(v)	I(A)	P(W)
A	220.00	000.0050	+000000.00
	F(HZ)	Deg.(U/I)	Q(var)
	50.00	000.00	+000000.00

StartUp Current:05.00mA
StartUp Time:015min
Passed time:000min010sec

6.6 F2 Function （no load test）

Press F2 key will begin 'no load test', LCD screen display as below
(If 'Search mark' function is enabled(in system ParaSet)):

Creep Test

	U(v)	I(A)	P(W)
A	220.69	000.0000	+000000.00
	F(HZ)	Deg.(U/I)	Q(var)
	50.00	000.00	+000000.00

Find Mark,,Please wait...

ESC=Return Enter:Creep Test

If 'Search mark' function is enabled(in system ParaSet), embedded software will process 'Search mark' function firstly, if 'Search mark' function is disabled, this screen won't display.

If 'Search mark' function is disabled(in system ParaSet), screen display as below

Creep Test

✳	U(v)	I(A)	P(W)
A	264.00	000.0000	+000000.00
	F(HZ)	Deg.(U/I)	Q(var)
	50.00	000.00	+000000.00

Creep Voltage:120%Un
Creep Current:0.00mA
Creep Time   :500min
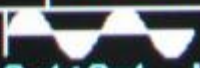Passed time:000min008sec

6.7 Error test
Step 1: User should set tested meter's parameters correctly!
(refer to 8.4.2   Set Parameters of tested meter [Menu item 1])
Step 2: Select Output current (Ib%); Select power factor(1.0L/0.5L/0.8C);
Step 3:   Press 'UI' key will begin 'Error test', LCD screen display as below:

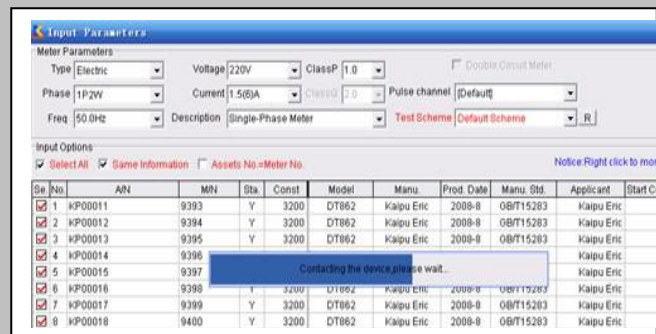| Status: 1P2W		Frd Ia Stop	
	U(v)	I(A)	P(W)
A	000.00	000.0000	+000000.00
	F(HZ)	Deg.(U/I)	Q(var)
	50.00	000.00	+000000.00
Un=220.00V	C= 01600.00		PF=1.0L N=02
Ib=06.00A			I=0100.00%Ib
Imax=020A	Fre=50.00HZ		U=100.00%Un
WaveForm:		up-Vector	
	Set:Set UI:Output		

Application software

Kaipu software is an excellent combination of wide experience of Kaipu manufacturing of meter test equipment and latest software technology. Which control and operate automatic meter test equipment using modern and highly flexible programs and user interfaces.This is accomplished with manual or automatic mode for testing,adjustment and calibration of electric power meters and auxiliary equipment. The use of proven and standardized engineering guarantees future reliability, flexibility and scalability of the Kaipu software applications as well as seamless integration into your company's business processes
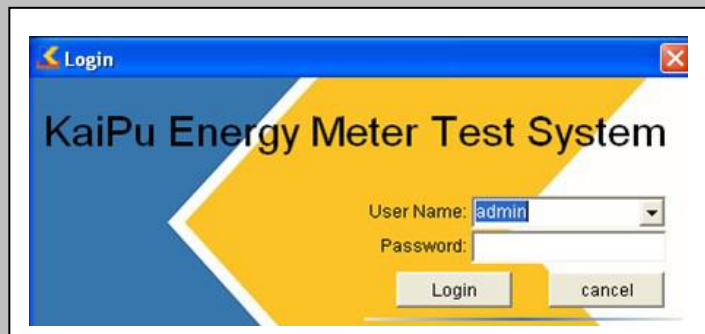
The basic Version of Kaipu software is compatible with Window 7® and network compatibility, hence common features of WINDOWS® OS are also available.
Also network-compatible and based on MS-SQL Databases
* includes import and export features for test processes and test results

* provides comprehensive statistics features for quality control

* consists of a number of programs, all capable of running on their own

* provides a user interface for system control   is designed for generation and control of automatic test procedures

* provides the ability of execution and debugging of VB scripts for data communication between software and the unit under test is displaying the test results of the meters under test

* serves for evaluation, reporting and data processing

Software specification please contact KAIPU company - "software manual. PDF"

KAIPU test bench working in Meter factory

More Video please check YOUTUBE , know more about us :
Please visit youtube list : http://www.cnkaipu.com/eyoutube.asp
Company website: www.cnkaipu.com
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You might be like :

portable type KP-P1001-C and KP-P3001-C

KP-S3000E THREE PHASE CALIBRATE TEST BENCH