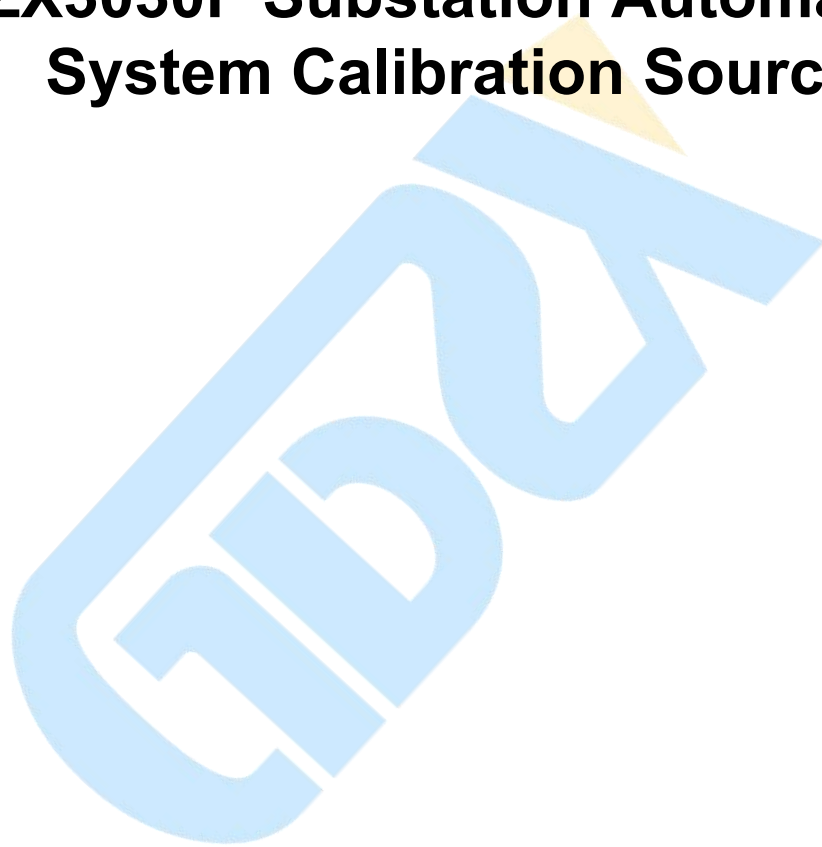


ZX3030F Substation Automatic System Calibration Source



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I、Overview

Power transmitter and ac sampling instrument verification equipment is my company in order to meet the needs of the instrument production enterprise application introduced the latest scientific research achievements of high technology products. The product reference advanced design idea, USES the powerful DSP digital processing system and high precision A/D and D/A converter, adopt the use of the user experience, set many years of research and development of electrical measuring instrument. Powerful, table source, integrated index is superior, reliable in performance.

II、Features

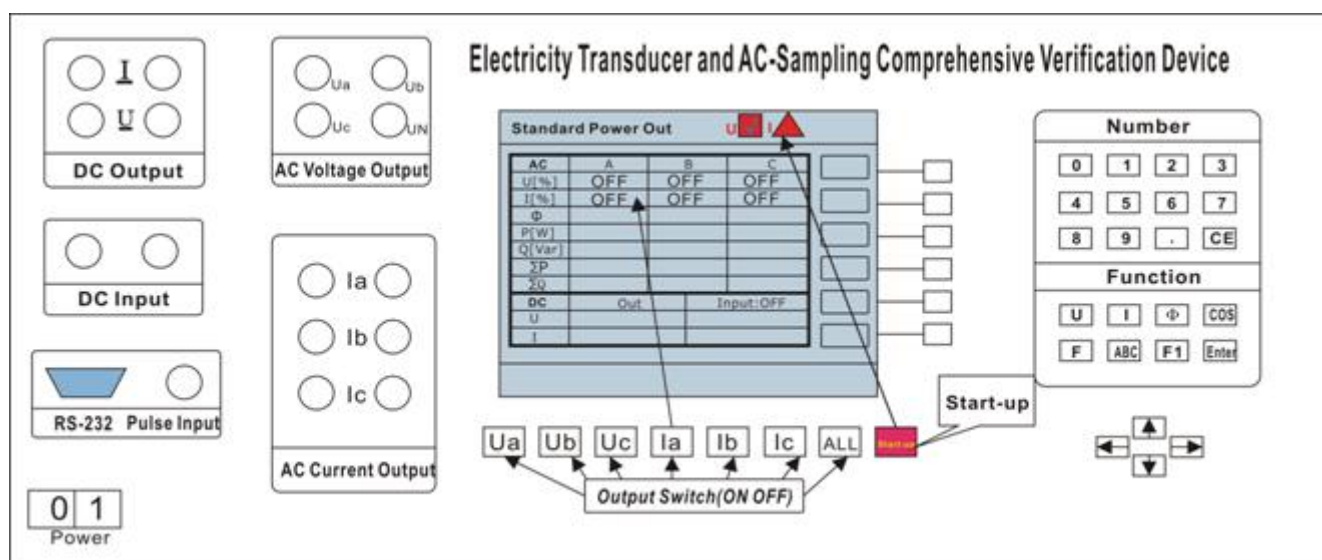
- 1, based on DSP digital signal synthesis and data collection and processing technology, makes the output device is stable and reliable.
- 2, gear integrated error of 0.05 on the Richter scale, high precision and indicators.
- 3, table source, do not need to match the standard table can be manual or automatic calibration of indicating instrument, transducer, ac sampler.
- 4, configuration, powerful microcomputer management platform, can be check by computer, transmission, printing and data management.
- 5, voltage and current range according to the temperature was set, automatic shift.
- 6, large screen LCD, pop-up menu in Chinese, the cursor to move, to provide online help tips, easy to operate, shows rich content.
- 7, ac/dc output voltage, current, and is equipped with power, frequency, phase, power factor and voltage current standards.
- 8, device have external calibration software functions.
- 9 points, can be set arbitrary load plan, a key in place, quick and convenient operation.
- 10, multiple protection: power linkage protection, current limiting protection, automatically shut off power output, etc.
- 11, the strict overload experiment, jolt, wrong operation test, high temperature aging test, unusually good reliability.
- 12, standard case, small volume, light weight.

III、Technical Index

Item		Technique Data
voltage	AC Range	basic range: 25V、100V、250V、600V
		Auto Range: 15V~600V
	DC Range	basic range: 100mV、25V、100V、250V、600V
		Auto Range: 15V~600V
	adjustable range	0~130% UN
	degree of regulation	0.002%UN
	Maximum output capacity	≥20VA/ phase
Accuracy	0.05 level (100mV 为 0.1 level)	
AC Range	basic range: 0.1A、1A、5A、25A	
	Auto Range: 0.05A~25A	

current	DC Range	basic range: 20μA、200μA、2mA、20mA、0.1A、1A、5A、30A Auto Range: 20μA~20mA 及 0.1A~30A
	adjustable range	0~130%IN(25A file, 0~120%)
	degree of regulation	0.002%IN
	Maximum output capacity	≥20VA/ phase
	Accuracy	0.05 level
frequency	adjustable range	45HZ~65HZ
	degree of regulation	0.01HZ
	Maximum output capacity	±0.01HZ
phase	adjustable range	0~359.99°
	degree of regulation	0.01°
	Maximum output capacity	±0.2°(Rated output voltage, current full scale)
Three-phase power precision		0.05 level (Reactive power for 0.2 level)
Symmetry three-phase voltage		Three phase four wire 120°±0.2° Three-phase three-wire 60°±0.2°
Voltage and current waveform distortion		< 0.3%
harmonic component		2~31 time (More than 11 times, can set the odd harmonics)
Voltage, current, power stability		≤0.01%(1 minutes)
measurement accuracy		0.02 level (0~±20mA、0~±10V)
Gear integrated error		0.05%
weight		18kg
volume		432×428×175
power supply		220V±10%

IV、Panel



Panel as shown above, from left since it includes right:

Dc output side: I (25 A) 0.1 A -

Dc output: V (25 V, 600 V)

Dc input: dc output at the transmitter

The RS - 232 interface: online interface

Photoelectric pulse input: receiving and other pulse signal; The output standard pulse fH, fL

The total power switch

Ac voltage output: Ua and Ub, Uc, and the Un

Alternating current output: IA, IB, IC

Liquid crystal display

The key area

V、 Backboard

After the board has three output port: 100 mv output end (four wire connection output);

Small dc current (including 20 A, 200 (including A, 2 ma, 20 ma) output.

100 v mains output (boot that is output, table) is used for checking synchronization


220 v mains output (boot that is output, provide the correction table working power supply)

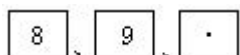
A power socket: there a fuse (fuse current 5 a)


VI、 Key

6.1 The left part of the main keyboard: device front panel. It includes 12 numeric keys, 8 function keys, the four direction (the cursor key).


The number keys:

 : Dual function keys. When the load state, for the number keys; When step regulating state power and for stepping adjustment key and key in number at the top of the value is the step by step.


 : number keys.


 : Remove the key. The removal of the digital input error.

Function keys:


 : Key parameter. Are: voltage, current, phase, frequency, power factor.

Quick function: in anyon screen, press parameters, can be directly into the power adjusting state.

 : Don't key. Press the key can choose ABC three phase tracking loop, just A phase, only phase B, C phase only. Used in control system of voltage or current harmonic phase adjustment.

 : Confirm button. The confirmation of the options.

Direction:

 : The cursor keys. Press the cursor keys, the cursor moves between the various options, which for the current cursor refers to the option.

Quick function

1. In anyon screen, press any key parameters, can be directly into the power adjusting state.

2. **F1**: Quick return key. Press the key at all levels from the submenu returned directly to the main menu.
3. Some key in addition to the basic use of the above, in some validation screen, according to the online help in the screen prompt, each have special functions.

6. 2 Auxiliary button: LCD screen on the right side of the column (6) no sign button. Its features are:

1. Menu button button. In the setup interface, it corresponds to the current screen in the menu of six sub menu button, press the corresponding key that is into the corresponding submenu. If "back" button, then return to the higher level menu.

2. Load point button. In the power control interface, it corresponds to the current screen in the menu button of six. Four load point button, simply press the corresponding button to load a key point in place. According to the fifth "fine-tuning" (the button and the function of the scroll) button to pop up in another four load point. At the same time, the regulation of electricity to step adjustment, through the keyboard of 0, 7 eight step number keys to value control power.

Load changes. Selected the appropriate load point button, press the number keys to add confirmation key and then press the button is set and save the new load point button.

6. 3 Pa button (switch): A line directly under screen button (8). These "UA", "UB", "UC", "1", "IB", is "IC" six single-channel amplifier output "on"/" off "switch button cycles. Switch to "on", the screen in the corresponding standard display window has a standard; Switch to "OFF", the screen in the corresponding standard display window with the words "OFF"); "ALL" for ALL power amplifier output "on"/" off "switch button, the control of ALL the power output at the same time" on "and" off ", such as the various "on" and "off" state, press "ALL", the first shut down ALL power amplifier output, again according to the "ALL", is at the same time open the six-way power amplifier output. "Start" for the soft start button, the keyboard area also has a red "start" button, their function and use method is the same (see the following the use of the "start" button).

VII、 The use of "start" button

In and to the right of the keyboard, a "start" button, its role is to start the device internal work power, specific use:

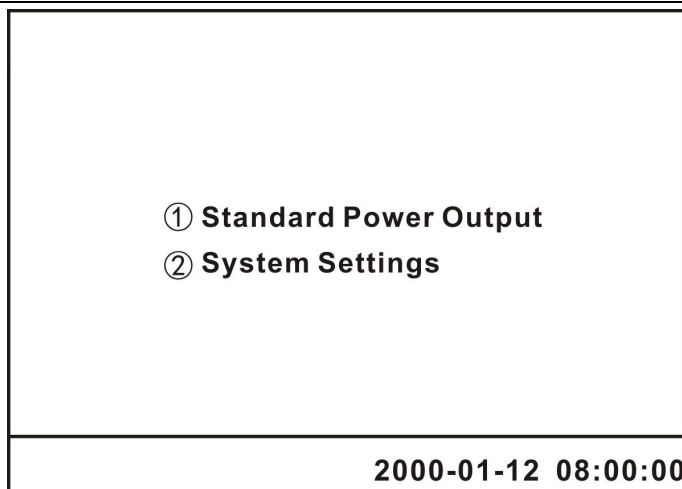
- (1) open the total power switch, such as after the device initialization (" Loading ••••• "disappear), be sure to click this button to start the device internal working power supply of the power amplifier. Otherwise, the device will not be output.
- (2) such as using the wrong operation in the process of short circuit or open circuit current (such as voltage), cause work power protection (characterized by lifting power, no output), troubleshooting, press this button can restart.
- (3) such as the working power supply is too low, or instability, may not start work internal power (characterized by lifting power, no output), after being returned to normal mains, can normal boot.

VIII、 Basic operation

8. 1 Starting up

The machine USES the large screen LCD display Chinese characters. In the bottom of each screen (or top) has a line of message, to the operation of the current real-time clew, therefore use convenient in operation, easy to master.

Open the total power supply, the screen will be the "Loading..." the words, a moment later, the device initialization is complete, the LCD panel will display the main screen:



Press ① key, enter the "standard output" screen; press ② key, enter the "system Settings" screen.

8. 2 standard source

When we need to get an adjustable standard power source, or to this device testing, the indicators are required to enter the implementation. Specific operation is as follows:

- ② Check the wiring is correct. Ensure do not short circuit voltage loop, current loop is not open.
- ② In the main screen,press ① key, entering a "standard output" screen, the following figure:

Standard Power Out				U <input checked="" type="checkbox"/>	I <input checked="" type="checkbox"/>	Menu
AC	A	B	C			Mode of Connect
U[%]						Settings
I[%]						Range
Φ						Electric Parameter
P[W]						Harmonic
Q[Var]						EXIT
ΣP						
ΣQ						
DC	Out		Input:OFF			
U						
I						
AC:100.0V/5.0A				[ABC] U: 0.000%		

Screen in the left is a table, for the electrical parameters of the standard display window, the content of the communication part of a display, in turn, is: each phase voltage current standard (optional percentage or direct reading), phase (optional) for the power factor of each phase, each phase active power, reactive power in standard, total active power and voltage of each wire standard (press the "U" key to switch display each phase voltage value), the reactive power, frequency standard; Dc part of a display, in turn, are: the content of the dc voltage output values, dc voltage measurement, direct current output values, the dc current measurement.

Table above, there are two power amplifier power running icon, "U" said power supply voltage amplifier work, "I" said current amplifier working power supply, the icon is normal run time , the icon is abnormal runtime , and the icon will be flashing.

Form a line current status display column below. Displays the current voltage range, current, power regulating value of information.

The right of the screen, there is a Menu (Menu) : "connection", "parameters", "range" and "electricity",

"harmonic N" and "exit", corresponding to six screen outside the button. According to the corresponding button, enter the submenu the operation of the device can be set up at various levels.

Wiring. According to the "connection" button, enter the "communication", "dc", "measurement" three options menu.

If press "communication" button again, will pop up "four lines", "three line" in the options menu;

If according to the "dc" button, will pop up "output" and "output" (dc voltage, current and output) in the options menu;

If according to "measure" button, will pop up "U", "I measure" options menu;

Parameters. According to the "parameters" button, enter the "straight" (direct readout voltage current standards), "full" (percentage display voltage current standards), "the wave" (each battery shows the superposition of harmonic standard), "fundamental" (each battery only shows the standard values of fundamental condition), and after (press continue down buttons) "harmonic" harmonic analysis (table), feedback "N" (press the button can choose "N" feedback loop or "feedback" Y. "feedback N" refers to the output device without digital feedback function, commonly used in the production of debugging process; Y "feedback" refers to the device with digital output feedback function, to ensure that the device in different load cases, its output can always closest to the set value. Every time after startup, device is automatically set to "Y" feedback state.) Six options menu.

Range. According to the "range" button, enter the "range" and "I range" in the options menu.

Press "U" range (or "range") button, into the voltage (current) range Settings screen. According to the need to press the corresponding button, can set the voltage (current) range. At the same time, the state of the screen in the bottom of the form prompt update information.

Voltage (current) range can be add or change according to actual needs, set up the eight range. The setting method is the same: in the main section, press the number keys to add confirmation, press down the cursor keys, can be carried out under a range of Settings.

Large range of output current and range. A level (in amperes) range can be set eight, mA, μ A range can be set of 4 each.

Power. Press the "power" button, enter the "U" (voltage), the "I" (current), " Φ " (phase), "PF the power factor (COS)", "F" (frequency) five power options menu. Press a power button, will pop up 4 power value, press the corresponding button again, the power can be transferred to set data.

In the main section, press the "U" and "I", " Φ ", "COS", "F" can quickly switch to adjust power, directly into electricity regulation.

In regulating power panel, press the cursor keys to move the cursor to a menu or , again according to the main section of "1-7" button, can adjust step of electricity. Within the key figures at the top of the value is the step by step.

The set point of each battery can be add or change according to actual needs, set up the eight range. The setting method is the same: in the main section, press the number keys to add confirmation, press down the cursor keys, can be carried out under a range of Settings.

8 set points of the power factor to number, first four [PF (L)] for perceptual point, after four for capacitive point [PF (C)].

In the power factor adjustment screen, press "COS", can be set in a circle by click on the "+" and "-".

Harmonic N. Press "harmonic N" button, then enter the "harmonic Settings" screen. According to screen the tips can be set up respectively "without harmonic" (display "N" harmonics), a voltage harmonic "only" (display "U" harmonics), current and harmonic "only" (display "harmonic I"), "both voltage and current and harmonic" (display "Y" harmonics) four state. Computer, the device is set to "N" harmonic condition.

8. 3 System Settings

In the main screen, press key, Enter the "system Settings" screen, the following figure:

System Settings		08:45:36
① Time	<input type="text" value="17-03-02 09:00:00"/>	
② Right	<input type="text" value=""/>	
③ Address	<input type="text" value="01"/>	
④ Reset	<input type="text" value="Password: ****"/>	
		F1: Exit

Up and down on the screen, press the cursor keys may choose to set up the project, according to the left and right cursor keys can be set.

On-line mode refers to the way of device interfaces with the outside world, there are RS232 and RS485 "in two ways. (**Remarks: This device no RS485 , only RS232**)

"Restore the factory value" refers to the standard data recovery equipment factory testing. When the device is in a specific work environment (e.g., near a strong arc, strong magnetic field, etc.), under the condition of strong interference, is likely to cause standard data loss (shown as output is normal, and standard value is "00000", or "gross error Numbers, characters, or the code, etc.), as long as to" restore the factory "at this moment, can make the device back to normal. The method is: input correct password "100.00", the device will appear Please wait "(wait), words, said after recovery. After shutdown, restart, the equipment back to normal.

IX、 Protection of the device capabilities

This device has multiple automatic protection function:

(1) power amplifier voltage regulator circuit with linkage to protect. This device of current amplifier and voltage amplifier of main power supply adopts this kind of circuit. Unstable when the power in the work or on the low side, or due to heavy load, resulting in decreased regulated power supply exceeds a certain extent, will produce an avalanche ripple effect and cause the whole no output voltage regulation circuit, power amplifier circuit so that it can't be damaged.

(2) power amplifier current limit protection. This device of the power amplifier circuit has the protection of power tube circuit. When the load exceeds the rated power, short circuit, open circuit, voltage or current amplifier circuit when the current is too large, protecting tube begin to work, make the output waveform amplitude limit, to protect the main amplifier tube from being damaged. Eliminate the short circuit current open circuit, voltage (or after removal of load), the circuit back to normal immediately. Of course, for a long period of time fault operation is not allowed.

(3) automatic shutdown protection power amplifier. When detects a phase in the overload operation, the system will automatically shut down the power amplifier, thus the output drop to zero. Set-up as in the "device" there was a close power amplifier protection screen, at this phase standard display will show "OFF".

X、Attention

- 1, shall not be short circuit voltage loop, current loop shall not open.
 - 2, the output direct current, alternating current output must be open, direct current output is not normal.
 - 3, 100 mv output, it must be with isometric and thick wire (random match test line), respectively, from the rear panel 100 mv output terminal two red, two black terminal lead as the load.
 - 4, behind the device has a heat fan. When using, do not pile up behind the sundry, ensure the heat flow.
 - 5, this device is a precision instrument, non-professionals do not open the case. Without the manufacturer's permission, no one shall be arbitrarily standard calibration device.
 - 6, ensure that the work environment clean, no corrosive gas, keep health.
- The abnormal situation such as device interference (such as crashing, any operation is invalid), can be turned off after the reboot to try again. It is fault, please contact the company.

Appendix 1, manual control system

(I) System requirements

Computer hardware configuration: more than 586 models, more than 16 m memory

Monitor: 800 * 600 * 16 k or better

Operating system: WINDOWS XP/7/8/10

(II) Install

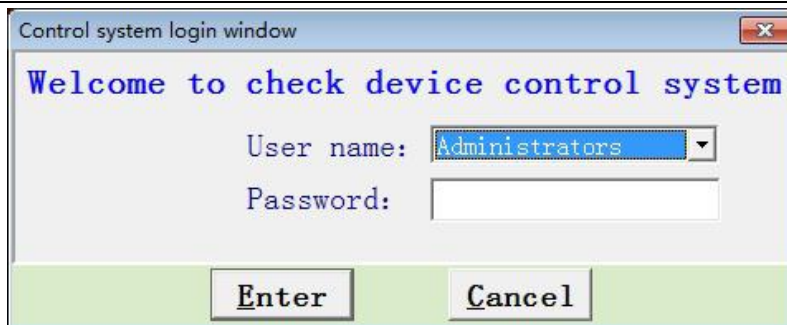
First step: the power transmitter and ac sampling instrument verification equipment supporting disc into drive, cd-rom will run automatically software installation interface products of our company, just click the "installation control system" the control system can be installed to the computer system (if the Windows setup CD inserts automatic notification). Is also available in WINDOWS found in the resource manager of CD in the drive of setup. The exe file, double-click the file to install.

Step 2: the software installation interface by clicking on the "installation Jet4.0 database engine", according to the prompt to the database engine installed on the computer.

(III) On-line operation

1、The preparation for online

1.1 in the first place in the correct way to pick a good online line (end by verification RS - 232 interface, end pick up computer COM port), will start verification, and run in the first screen; Click Windows on the desktop shortcut " ", the control system will run to the password input window, as shown in the figure below:



During the first installation and use, the user is called the "administrator", password for no, click "confirm" button to enter the control system.

1.2 for the first time in online, should be set up and used to join tester computer serial port correspondence, otherwise can't online, the specific method is to run the system choice "in the main menu" communication parameter Settings...". The menu, the system will pop up as shown in the figure below communication mouth parameter Settings window:



In the "inspection device communication port Settings" box "serial port choice" are connected to the check list box, select the serial port, if you want to ac sampling device for automatic calibration and measurement are also should be set with ac sampling measurement device connected to a serial port, setting by clicking on the "Settings" button, after the completion of the system can save the Settings, later online can no longer communicate mouth set (if you don't change the serial connection mode).

2、Start online

Access control systems, just click the "on-line operation of control system from the menu" start online "button, verification will automatically enter the online screen, a word" is online... ", and control system will pop up as shown in the figure below test data hint window:

The verification has handed control of the computer control system; Can now on microcomputer, watt-hour meter, or indicating meter transducer calibration data.

3、Test data

In the above data suggest window, according to the actual situation, select a transport "indicating instrument", "transmitter" or "watt-hour meter", when click one of the buttons, control system will be a progress bar at the bottom of the window, as shown in the figure below:

After when the progress bar reaches 100%, the system will pop up test data transmission prompt window, has

been transmission transmission button is no longer valid, as shown in the figure below:

By clicking the corresponding button, until all the test data into computer.

4、 Disconnect the online

When a user transmission as shown in the test data or completion of the calibration data transmission prompt window midpoint press "cancel" button, the system will automatically disconnect online.

5、 Storage test data

When deposited in the calibration data into the computer, can accordingly be deposited in the database. By performing "on-line control" under the main menu of "indicating instrument", "transmitter" or "watt-hour meter" sub menu under "verification data in the database," the system will pop up inspection unit input box as shown in the figure below:

Enter the inspection after the unit and press the "confirm" button, the system will automatically power transmitter and ac sampling instrument verification equipment storage test data in the database of the control system, convenient management in the future.

(IV) Indicating instrument for real-time control

Through the computer control procedures, can be of various indicating instrument for computer is convenient and fast correction table operation, and test data can be stored in the database control system, convenient to print verification report and verification records and data query verification. Specific operation is as follows:

1. Run the indicating instrument real-time control

In the control system is the main form, run "on-line control" in the main menu "indicating instrument real-time control," wait for a few seconds, the automatic control system will get the "window indicating instrument real-time control" (if online line is connected with a free serial port), as shown in the figure below:

After entering "window indicating instrument real-time control", before the inspection table, the various parameters of the system requirements input instrument related in this form, the label shows that for the red box must be input, inspection table operations can be carried out, such as "inspection unit", "instrument type", "grade index" and "meter number", "test date" and "reference value (that is, the maximum lattice degree)", etc. In this form in some fields only after the choose specific instrument type will appear, such as "power factor to number" only when "instrument type" for the power meter to appear; "Minimum frequency" only in the "instrument type" to "work frequency table".

"Position effect" checkbox to decide whether to position impact test instrument.

"Up and down" selection box can choose school rise only check point (up), or up and down all schools (two-way).

"To" most instrument selection box select only the correction to the check point (positive) or two-way verification.

"Check point selection" checkbox can choose each case, every five lattice, each and every 15 ten frames, every 20 or manually check point, when choose to manually check point, will give a show each change the input box check points and a "set inspection point" input box, by changing the test points, the system will automatically in the "set

inspection point" in the input box to fill in the corresponding inspection point, and it can also be a check point changed by double-clicking on the value of the fixed point.

We used a voltage change ratio 15.75 KV / 100 v, electrorheological than for 12 ka / 5 a, grade index of 2.0, meter number is 12345, has position signal, a pointer to a single direction of three-phase three-wire active table, for example, to illustrate how to use a computer verification indicating instrument.

Note: for change than instrument, in the choice of "reference value" units must choose good corresponding units, so table to choose "MW", for KV table to choose "KV," for thousands of Ann table to choose "KA", for multiscale table, the unit must choose "reference value" ", "(with the exception of resistance meter), and to check the rest of the range.

2. Input parameters indicating meter

In the "parameters" indicating meter input window, corresponding input instrument selection parameters, we choose "position effect" and set the power due to the number of 0.5 L, maximum lattice degree of 1/2 (here on behalf of 125), after input the required fields as shown in the figure below:

In the parameter input box, the mandatory input at this time, also can be in the school table after the table, before "results in the database, by clicking on the" instrument control "box" instrument parameter input "button to enter. Choice after input the instrument parameters, check meter test conductor is whether correct, after is correct, click "start school table" button, then the system will control calibration device is set to check the instrument's initial state, the voltage power to 100% (100 v), will be A phase position to 30 °, the phase position of 330 ° C, the current to the first check point to the required value (current is set to zero value in this table), wait A few seconds after the control instruction transmission, namely into the "meter calibration verification" window.

Note: if a parameter input Chinese characters display is not normal, can be in accordance with the first a "space" button, then input parameters.

3. Test the basic range

After entering the "meter calibration verification" window, system will be updated every second power twice, as shown in the figure below: :

After entering the "instrument verification" window, "the school table control" in the range test button for effective and displayed as blue (the current display window), the instrument parameter input button displayed as black (not the current display window), if in the process of instrument calibration, want to go back to "instrument parameter input window, just click on the button of instrument parameter input, as shown in the figure below:

After entering the "instrument verification" window, the system will automatically measuring instrument of the first check point, and display the error, but at this time by selecting the electrical parameters in the lower right corner of "adjust output" box type (voltage, current, frequency, phase, power factor), and click on the step to adjust output button, can change the current electricity parameter values.

Test if must carry on the card table, click the "card table test" button, the system will automatically for the current test instrument for card tables, about 30 seconds later, instrument pointer automatic back to zero.

When the meter pointer to just to check point, just click the "store error" button, the system will automatically save the actual reading and error in the "basic range error display" box, and will automatically slow electrical parameters

l/slow falling tone to the state of the next check point, when the will to power value, the regulation system will be changed to 0.1% of the step values continue to rise slowly/slow down, "on hold" will be changed from grey to lifting power can click, as shown in the figure below:

At this time, the instrument pointer also in slowly change, when just to check point, should immediately by clicking on the "on hold" button lifting power, after that, the system is not adjustable power and update the electric parameters of the display, and will automatically calculation error, as shown in the figure below:

Same as above, if the instrument pointer and check point correspondence, not to "adjust output", make the instrument pointer and check point correspondence. Then click on the "storage" error, the system will automatically power adjust again to the next check point, through the same operation until you test all check point, the system will automatically clear power and close the switch power amplifier, automatic computing mean value, average error and variation, as shown in the figure below:

And will report window pop up as shown in the figure below:

4.Set the table

After verification the basic range, if you find some inspection fixed-point big error of the instrument, can be directly on the table to conduct repair (for checking device power is zero, and the power amplifier has been closed, so the test leads from the meter can be removed without adverse effect on calibration device), when the callback after the repair, can receive the table again, double-click the "basic range error shows some of the big error checking point, then the system will automatically again designated for state power to the detector, and the error again, after good Pointers to, can click on the" store error "button again, the error of the system will be the new deposit and the location of the actual readings covering big error.

Note: after storing the new error, remember to click on a "power" button, so that the system will automatically power down to zero, shut down power amplifier.

5. Position the significant

After verification the basic range, if the "parameter input box" chose "position effect", in the "power and error adjustment

Poor "dialog will be displayed in the" test "button, as shown in the figure below:

Simply click the "test" button, the system will display in the bottom of the window "verification" check box and in the central display "affect the actual value display box, as shown in the figure below:

Which affect the actual value display "box shows the value of the can according to the" mark "in" parameter input value choice is different.

According to the prompt "position effect verification" box, and click the "measuring threshold" button, the system will power up to the basic range of "measuring threshold", are shown below:

Through adjusting the output button, and the corresponding adjustment and measurement instrument pointer to the lower overlap, click the "save the actual value" button, then the value will be shown in the "actual reading" save in "location affect the actual value display" box "standard", "measuring floor", and "measurement limit" button will be changed from grey to clickable, as shown in the figure below:

Click the "measurement limit" button, the system will power up to the basic "measurement limit" in the range, are shown below:

Through adjusting the output button, and the corresponding adjustment and measurement instrument pointer to limit overlap, click the "save the actual value" button, then the value will be shown in the "actual reading" save "location affect the actual value display" box in the position of "standard" - "measurement limit" and "power" button will be changed from grey to clickable, and demand power, as shown in the figure below:

By clicking on the "power" button, then the system will power down to zero, then the measuring limit "will be changed from grey to clickable, the system will prompt" click "measuring limit" will measure the left deviation from the lower limit of 5 ° actual values ", before clicking on the "measuring threshold", meter to the left deviation should be 5 °, then click the "measuring threshold" left deviation 5 ° of the test instrument.

Through similar operation, verification of other position respectively, and finally all the position after the impact test, system will pop up a prompt window, as shown in the figure below:

Click the "ok" button, then click the "test" button, then the system will be based on the verification of the variation of "position effect" (if the parameter input box "is marked" chose is worse than the 50% margin of error is judged as not qualified, if the "mark" is worse than the 100% margin of error is no judgment for unqualified), display position influence whether qualified, as shown in the figure below:

Click the "ok" button, then "position effect" after verification.

6. Check other range

When the basic range after the verification, "timing control" in the "other range" and "results in the database will be changed from grey to clickable, as shown in the figure below:

If you are testing a multirange instrument (note: the reference value of multirange instrument units should choose "grid", to set up other range), can click on the "timing control" box "set other range" button, the system will get the "other range Settings" window, check point will automatically in accordance with the procedures will be zero point and the reference value, maximum error check point to the location of the fill in the first, second and third check point, as shown in the figure below:

The corresponding input voltage current range, click the "add" button, system will display in the "other range" display box, as shown in the figure below:

If in set other range, they found the range shown in the "other" range don't correspond with the actual and can move the mouse to the "other range" display box, in the don't correspond with the actual range line click the left mouse button will be selected, and then click the right mouse button, the system will pop up "to delete the current range" menu, just click the "delete current range" menu can be deleted from the "other range" display box.

After setting the other range, according to the instrument gear to other range of the first position, click on the "start verification", the system will power switch to the first other range of zero calibration point (check other range, we only test were 0%, 50%, 100%, and in the basic range corresponding to maximum error of the lattice degrees), after about 30 seconds, after system transfer control instruction, the system will turn to "range verification" window, as shown in the figure below:

Verification and basic operation range, only click "store error", adjust the output of good point, then click the "store error" under test, until you test the range. When the other range after the verification, the system will pop up as shown in the figure below hint window:

Click "ok" button, "meter calibration" box at the bottom of the "examination next other range" changed from grey to clickable, as shown in the figure below:

Then click on "check the next other range", the system automatically clear power and close the power amplifier, "other range" display box automatically for the next other range, "verification" changed from grey to clickable, as shown in the figure below:

Display value to replace instrument with "other range", click "start test" button, the system will automatically transfer power to the next other range zero calibration points required value, and automatically update the power value, the calculation error, as shown in the figure below:

When verification after the last one other range after the last check point, the system will automatically clean electricity, power amplifier, and the pop-up prompt window.

7. The current database indicating meter

When a single range instrumentation basic verification, or multirange instrument all range verification is complete, click popup instrument verification system is completed in the prompt window "ok" button, the system will automatically "timing control" in the box "results in the database" button for the current focus button, then can click "results in the database" button, the system will automatically "indicating instrument parameters input parameter values and" meter calibration "in the window of the inspection point, reading values, error in master-slave database, and automatically determine test result is qualified or not.

Note: the system in the process of inspection table, and all the inspection point error by the "GB 8170-87 numerical revised rules to fix some error.

8. table of strings

When after verification a meter and deposited in the database, the system will automatically turn to "instrument parameter input window", the following figure:

At this time, if you still want to see just verification instrument calibration data, can click on the "timing control" box "range check" button, the system will range verification window to display, as shown in the figure below:

Just click on the "input parameters" window in the "table" button, the system will be a watch on the input

parameters to clear (if keep the last input parameter is empty), as shown in the figure below:

To choose the input to the next block waiting for inspection instrument parameters, start verification under a meter.

9. Exit the indicating instrument real-time control

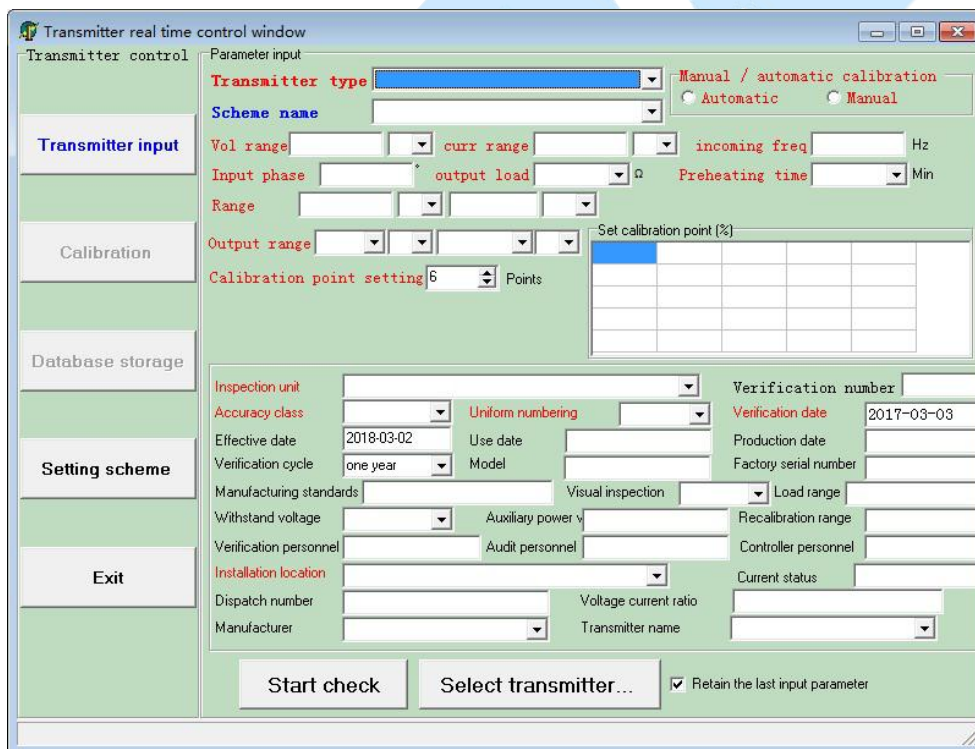
If the instrument test completely, can click on the "timing control" box "exit" button, the system will automatically return to the main display window.

(V) Transmitter real-time control

Through computer control procedures, can be of various transducer for computer is convenient and fast correction table operation, and test data can be stored in the database control system, convenient to print verification report, the notice of verification results, verification records and verification data query. Specific operation is as follows:

1. Run the transmitter real-time control

In the control system is the main form, run "on-line control" in the main menu "transmitter real-time control," wait for a few seconds, the automatic control system will get the "window transmitter real-time control" (if online line is connected with a free serial port), as shown in the figure below:

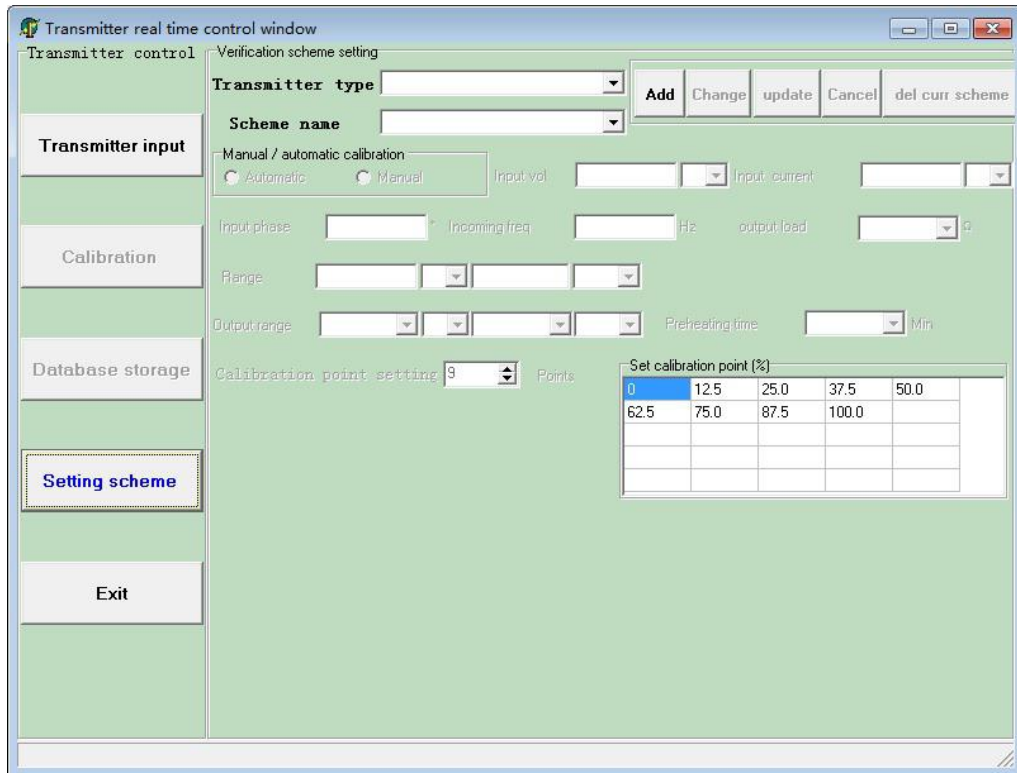


In form to the left part can control the display real-time control to operate in the form in the transmitter, the current display window experience in blue bold font, such as the current is in "input transducer parameters" window (the default state of real-time control system into the transmitter). There are other "transducer calibration" and "set verification scheme" window will detail in the sections below.

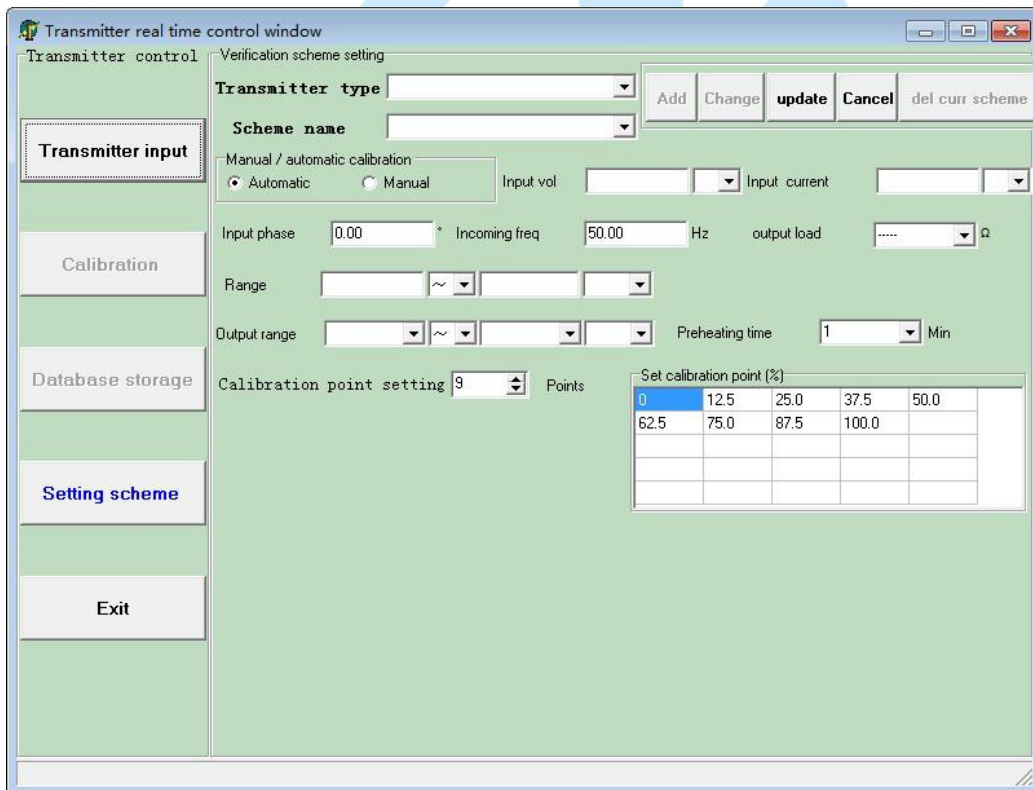
2. Set up calibration scheme

First installation and use of control system, the system of "test plan" is empty, the user should set it again by yourself before inspection table, click on the "transmitter control" box "set verification plan" button, the Settings for verification plan "button will change from black to blue, the system will display a" set verification scheme "window,

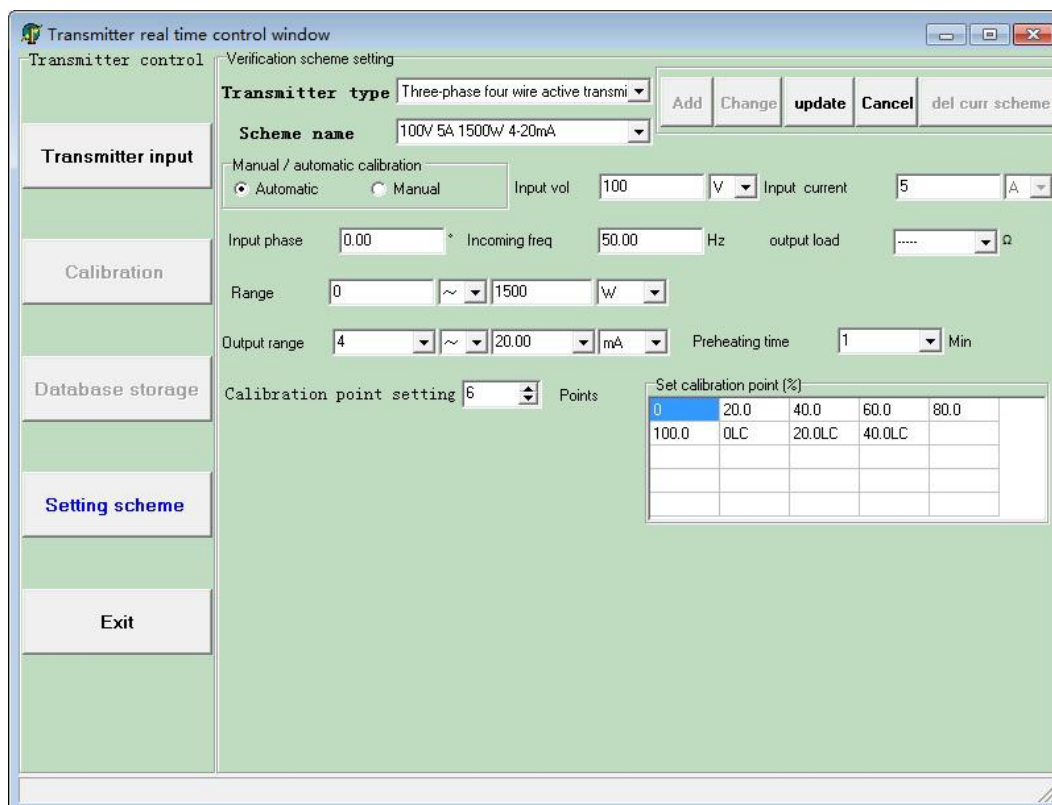
as shown in the figure below:



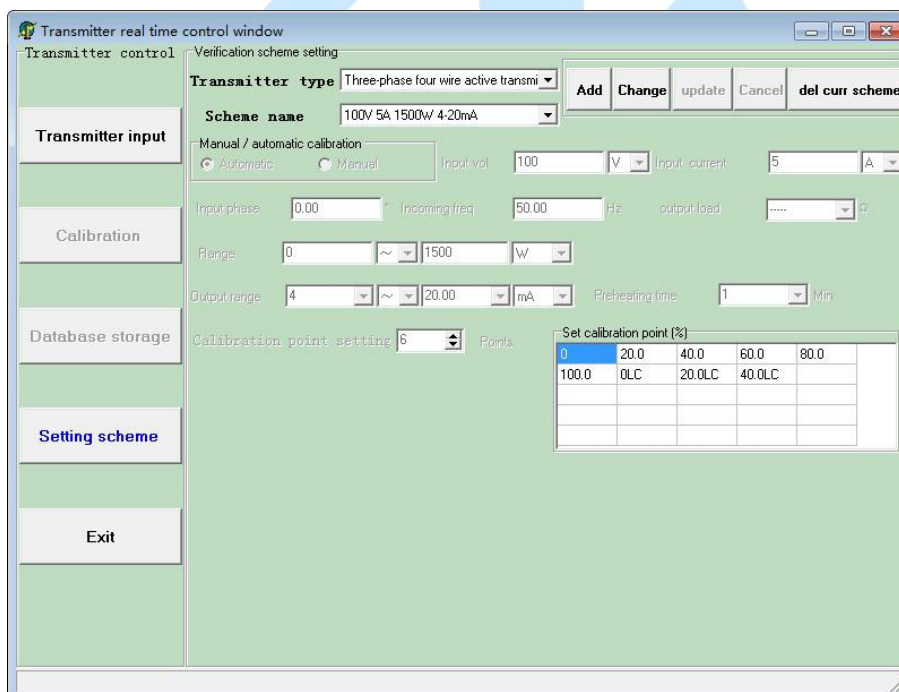
If want to set up the "test plan", just click on the "verification plan Settings" in the "new" button, the form will become as shown in the figure below:



First choose to check the "type" in the transmitter, if choose "ac voltage transducer", and enter "input voltage" and "transmitter range", "check point", "name of verification scheme", as shown in the figure below:



When all items are input the correct values, click "update" button, then the system will this deposit "test plan" to verification plan data, convenient after use, after the "update", will become as shown in the figure below:

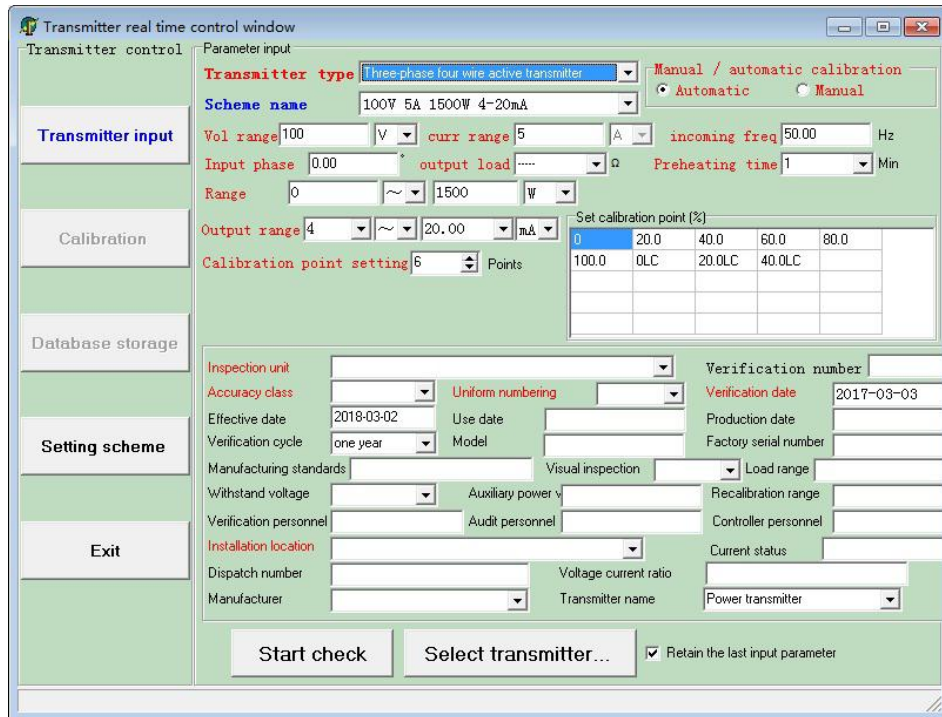


Through the above method, the user can according to own actual situation, set up several more "test plan".

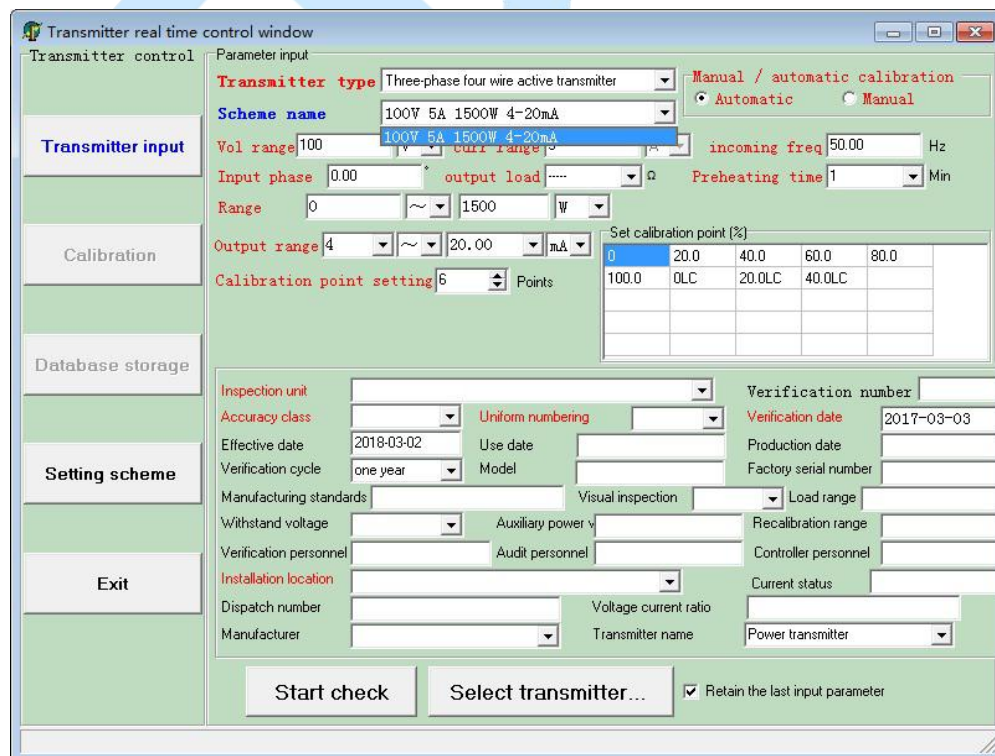
3. Transmitter input parameters

After entering "window transmitter real-time control", before the inspection table, the various parameters of the system requirements input instrument related in this form, the label shows that for the red box must be input, inspection table operations can be carried out, such as "inspection unit", "instrument type", "grade index", "meter number", "test date" and "transmitter range", etc.

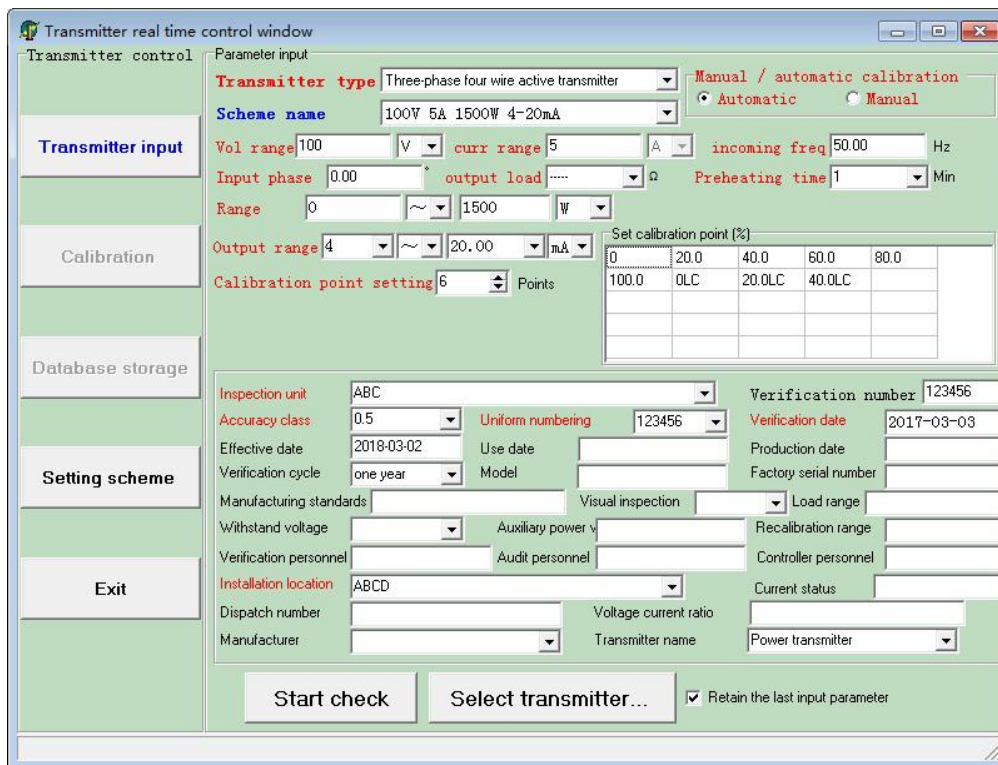
First selection will be inspection transducer type, such as "alternating current transducer", then the system will automatically in the original "set verification scheme" all "alternating current transducer" set in the verification plan displayed in the "inspection" designated project name, and automatically choose the first scheme, and the parameter input box upper department will automatically fill in the parameters of the test plan. Also don't choose "name of verification scheme" and input the parameters directly, then "verification scheme name" box is not input. As shown in the figure below:



If you want to choose other verification scheme, can click the "verification plan name" in the "▼" button, system will pop up all the ac current transducer "test plan", as shown in the figure below:



Choose "test plan", also should be input "inspection unit", "grade index", "transmitter id", "test date" and other information, as shown in the figure below:



Last as long as you click the button "start inspection table", then the system will automatically sent to the entered parameters timing device, control commands transmission after a few seconds, the system automatically enters "transmitter verification" window.

Note: before click "start inspection table", check the transmitter each input and output are connected correctly. In case of damage the transmitter or timing device.

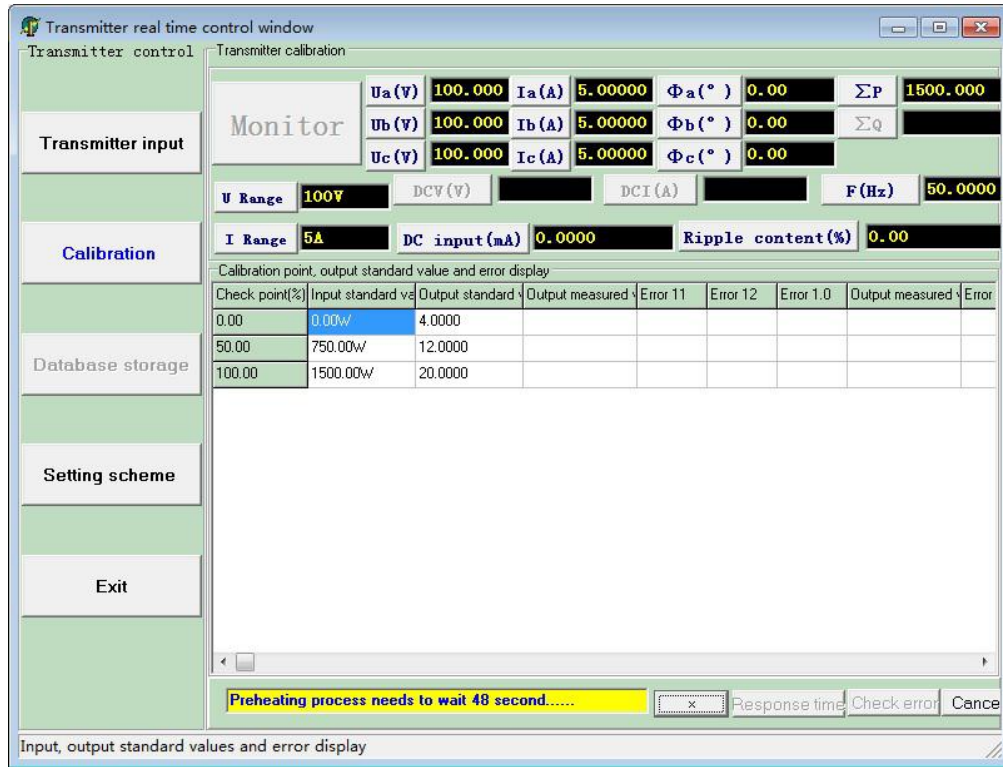
4. Transducer calibration

After entering the "transmitter verification" window, the system will according to the parameter "transmitter" input window "manual/automatic verification of choice" in the box is to choose the "automatic test" or "manual calibration" design respectively.

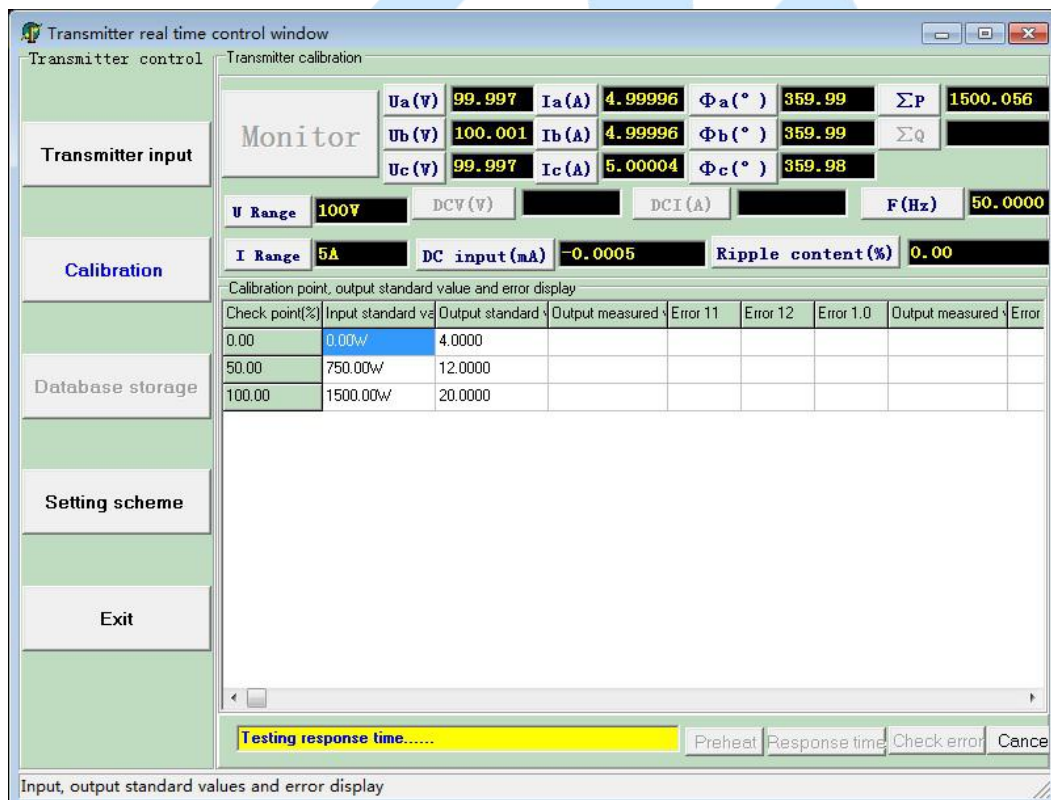
4.1 Automatic calibration transmitter

Automatic calibration transmitter is a transmitter detection method without human intervention, the system will automatically power, preheating, measuring response time, fixed point and measurement error and qing power. Finally, manual intervention is just click the "transmitter control" in the "results in the database" button, verification results will be automatically deposited in the database.

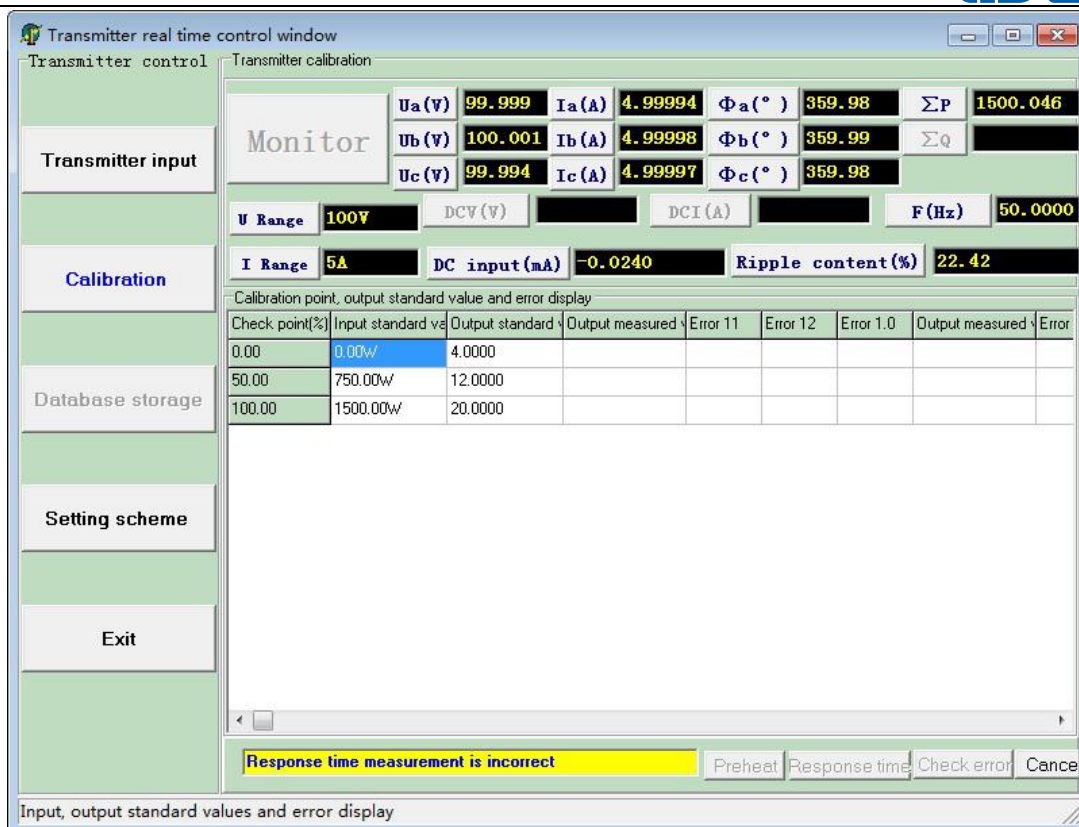
After entering the "instrument verification" window, the system first power will be promoted to full state, and according to the "transmitter parameters" input "preheating" preheated in window, as shown in the figure below:



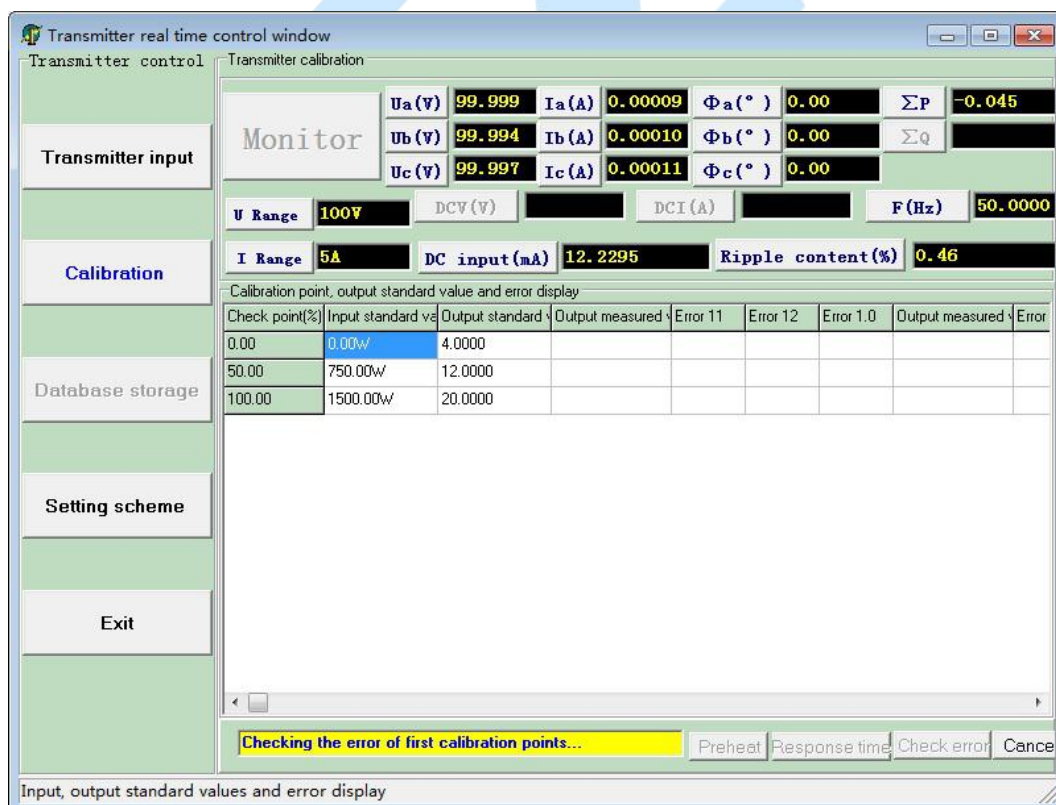
After reaching the "preheating" (if you don't want to wait, also can click on the original "warm up" button in the "X" button to suspend the preheating), the system will automatically measure "response time", as shown in the figure below:



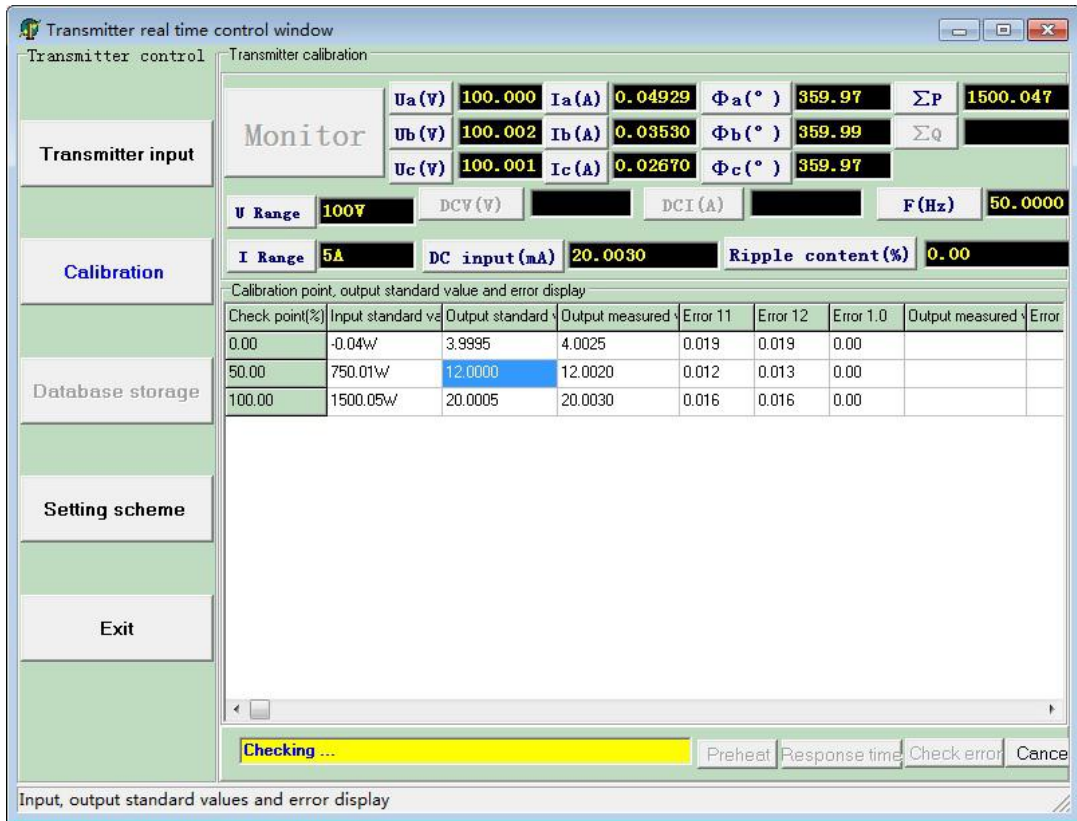
After measuring the response time, the system will show the measured response time value, as shown in the figure below:



And then automatically check the first inspection point, will increase capacity to the appropriate value, and updating measured values, as shown in the figure below:



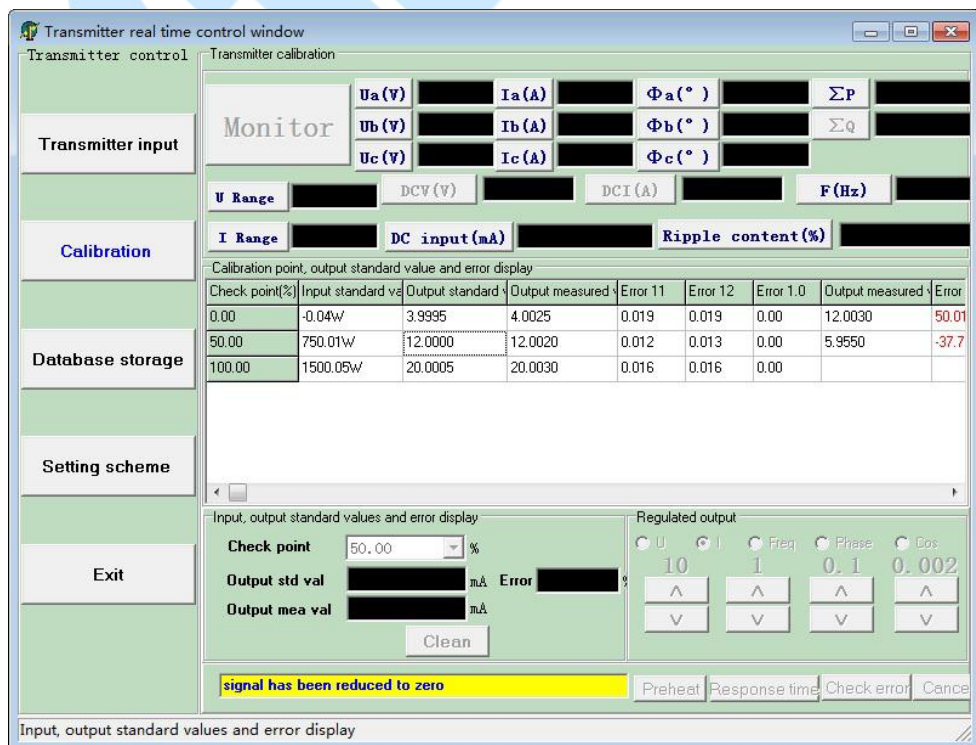
System will automatically judge whether a check point power stable, if after stabilized after automatically save the current "output measured values" and "error". So, until all check point after verification, the system will automatically clean electricity, power amplifier, as shown in the figure below:



When after cleaning power, system will pop up as shown in the figure below finished the verification dialog:



Simply click the "ok" button, then "transmitter control" box "results in the database" button from the ash into clickable, and automatic focusing, as shown in the figure below:



Just click on "the result into database" button or the blank space key, then the system will automatically into the transmitter all information. And after the exit "transmitter real-time control", will display in the main form for the current record.

If not found in the process of inspection table setting parameters, such as unit selection "standard output" error, practical for the current (mA) and chose the voltage (V), can at any time by clicking on the "transmitter verification" window in the "cancel test" button, system will pop up warning window as shown in the figure below:

Simply click the "yes" button, you can cancel the test operation, and clean electricity, turn off the power amplifier.

4.2 manual test transmitter

Is the difference between a manual test and automatic test, hand DongJian each test stage should be regularly by clicking on the corresponding button, manual inspection point also need human input inspection point, and click the "test" button, error also need to click the "save save error" button, but can check a check point, fine-tuning.

Verification operation window as shown in the figure below:

To change the inspection point, can be in "check point" in the input box input dot percentage, and then click the "test" button, if the monitor "table" shown in the power and the input values have bigger difference, but also the relevant button, click the "adjust output" fine-tuning.

5 . In the table

When the verification process is complete, click on the "transmitter control" box "transmitter parameter input" button, then click in the "input transducer parameters" window "in the table" button, as shown in the figure below:

The location of the original "form" button will become "start inspection table", then can choose to enter the next piece of the parameters of the transmitter, get ready for the next piece of transducer calibration operation.

Note: if the verification operation is completed, should be in front in the table according to "the database" button, and the verification results will be stored in the database, if you do not click the "results in the database, the transmitter is the verification test results will not be deposited in the database.

6. The table

When the automatic calibration verification is completed in the transmitter, can be in the "check point, the standard output and error display" box, double-click the one unit, can be in one unit of fixed-point test and automatically update the error, a check point error updated another line can also double-click the unit test another check point.

7. Quit the transmitter real-time control

When after verification of a transmitter, after verification results in the database, don't want to check other transmitter, then click "transmitter control box can be in the" off "button, then the system will automatically disconnect from school table instrument of communication, make the timing device is not in the online state and return to the first screen.

(VI) Ac sampling measurement device calibration

Now most of the testing personnel for ac sampling measurement device calibration work, are generally through a lot of complex data record and tedious operation, cost a lot of manpower and energy, the efficiency is very low. Through computer control procedures, this device can telemetry for the ac sampling device for automatic or semi-automatic calibration precision. Greatly enhance the work intensity of the testing personnel.

Automatic calibration, just put the device of RS232 communication interface, RS232 communication interface of ac sampling unit respectively connected to the computer, the device of voltage and current output corresponding to the input end of sampling device access through the computer reads the device output values and the measured value of the ac sampling unit, comparison, automatic error, greatly reduce the work intensity of the testing personnel. Its operation is: in the "parity" selected "automatic", the device will be effected according to the set test project, in turn, the error of the automatic verification by equipment of all sites. Due to all kinds of different communication protocols of the sampling device, automatic calibration program is different, therefore, the automatic calibration program should be designed by the programmer to the user is Abby and guide fee (the resulting), there is no detail.

Semi-automatic calibration, RS232 communication interface to devices connected to the computer, the device of voltage and current output corresponding to the input end of sampling device access through the computer reads the device output values and the manpower read and the measured value of the input ac sampling unit, compare and then obtained the error.

Its operating method is as follows: in the control system's main form, can be run separately "on-line control" main menu "ac sampling measurement device calibration" of the following three child command:

- (1) ac sampling measurement device calibration
- (2) inspection scheme set
- (3) manually add ac sampling inspection report

1. Ac sampling measurement device calibration

In the control system is the main form, run "on-line control" main menu "ac sampling measurement device calibration" in the "ac sampling measurement device calibration", namely into "ac sampling measurement unit for real-time control" window, as shown in the following diagram (figure 8.1.0) :

On the screen, can be directly set "verification information"; Press "exit" button can return control system is the main form.

If you want to change the name of "unit" or "nameplate information and installation information" and so on, according to the "measurement device parameter Settings" button, system will pop up a window "basic parameter input ac sampling measurement unit", the following graph (8.1.1) :

On the screen, can add or change each parameter; According to the telemetry parameters button (or in the screen shown in figure 8.1.0 press "telemetry parameter Settings" button), the system will pop up a "RTU remote sensing parameter input window", ac sampling measurement device used for the automatic calibration; "Click" back "button, to return to a screen, the screen shown in figure 8.1.0.

In the screen shown in figure 8.1.0 according to "inspection program Settings" button (or in the control system's main form, run "on-line control" main menu "ac sampling measurement device calibration" command) in the "inspection program Settings" son, namely into the "inspection program Settings window", as shown in the following diagram (figure 8.1.2) :

In the screen, can in turn on voltage, current, active power, reactive power, power factor, frequency, remote transmission of data than the fixed point set. Press the "default" button, the interface of tick as "default" checkpoint, such as the need to modify or add, can press "save"; If you want to change or add, is chosen as required after each checkpoint, then press "save" button. In this interface, in addition to the default package, also can be set up and save the five kinds of common solutions. Such as press "1" button first, then selected the needs of the checkpoint, then

press "save" button, which set the "solution 1", the next time when using this scheme, only need to check in a 8.1.0 screen in selected "solution 1". The same method can be set up "scenario 2", "5".

In the screen shown in figure 8.1.0 press "check" button, which will enter the "window ac sampling measurement unit for real-time control" (before entering, the system will prompt you to check whether has correct connection), the following graph (figure 8.1.3) :

After entering on the screen, the device will automatically rise a certain range of power, make the school charged run preheating equipment. Then, press the "start" button, the device will appear, in turn, voltage, current, active power, reactive power, power factor, frequency, data remote transmission ratio on the inspection point measurement value and the background value input window, the following graph (figure 8.1.4) :

Input at the screen to read the school by the measured value of the sampling device and the background of displayed value (in theory for the secondary value multiplied than), press the "ok" button, the device will automatically go to the next site check, calibration process, according to the screen shown in figure 8.1.3 parameters in the key button, can view real-time calibration results, for example, according to the "voltage" button, you can view the checking result of voltage measurement, until the end. All of the project after the check, the system will automatically pop up a small hint window "pilot project inspection, can be deposited in the database", press "confirm" button, and then according to the figure 8.1.0 "database" button in the screen, according to the system prompt, until will test data in the database.

2. The inspection program Settings

In the control system is the main form, run "on-line control" main menu "ac sampling measurement device calibration" in the "inspection program Settings", or in the screen shown in figure 8.1.0 according to "inspection program Settings" button, can enter the "inspection program Settings window", as shown in figure 8.1.2.

3. Manual increase ac sampling inspection report

The function is mainly to help arrange to purchase the testing of calibration device was previously recorded data and automatic processing data, report form, makes the previous inspection results and methods of management and now format in the future. Its operating process is similar to the calibration process, the control system is the main form and run "on-line control" main menu "ac sampling measurement device calibration" in the "manual increase ac sampling inspection report", namely into "ac sampling measurement unit manual detection window", as shown in the following diagram (figure 8.1.5) :

According to the inspection record, according to the diagram above "measuring device parameter Settings" button, the parameters can be input; Press "check Settings" button, the original check point set to "1" (hypothesis testing scheme selected "solution 1", set the plan should be consistent with the test plan you choose); To manually add report according to the "start" button, input window will pop up a measured value (figure 8.1.4), then, will record the calibration data input corresponding box, press the "ok" button, then enter the next check point, the same operation, till the end. System will be prompted to save operation data. After a set of data, to manually add report "start" button to "in line" button, the tips on to the next group of input data.

(VII) Database operations

The database interface is as follows:

Master database browsing, in accordance with the "inspection unit", "instrument type", "instrument", "factory number" and "test date" to gradually thinning to locate a record.

1、 database backup

Due to the database file to use, in order to effectively protect the database resources, you should get into the habit of backing up the database on a regular basis. Specific operation is: the execution of the main menu "database management" menu of "backup..." command, control system will pop up as shown in the figure below backup database file input box, you just open the corresponding backup paths, and then type the backup name you want, you can to save the current database, for after recovery.

Backup Windows as shown in figure:

2, the recovery of database

If you have the database backup before once,, as long as executed "database management" from the menu in the main menu "restore..." the order, the system will automatically pop up a recovery of the database window, if you find the original backup file path choice after take the file the original data records can be added to the database.

Restore Windows as shown in figure:

3, delete the database

With the increase of blocks check table, the database record number more and more, nature will make the control system database management panel data items in the more and more, if item is too much, then you can consider a database backup first, and then delete the database to clean display window of the control system and better for database operations.

Can be performed through the main menu of the "database management" menu "indicating instrument", "transmitter" or "delete..." the order of watt-hour meter, control system will popup window to delete the following database:

As long as the option to delete the corresponding selection, and then click the "confirm" button to meet the conditions of database records deleted.

4, the database record changes and increase

If you want to change the database record of some field values or to add new records, can be performed through the main menu "indicating instrument", "transmitter" or "watt-hour meter" "database management" in the menu of "increase and change..." command.

Data records Windows updates and additions such as losing graph:

5, database of batch change

If you feel there is a lot of records in the database of some field values are the same, but do not want to repeat every increase a record of input the same field, can through the main menu of the database management "menu" indicating instrument ", "transmitter" or "watt-hour meter" in the "batch change..." Menu, the system will pop up as shown in the figure below the query window:

Enter the same record in common and choose to batch change the field values and enter a new value, click "modify" button to achieve this purpose. Input conditions such as below:

6, database queries

If you feel that the display of data items is too much, can through the main menu of the "database management" menu "indicating instrument", "transmitter", or "watt-hour meter" "query..." The menu, the system will pop up as shown in the figure below the query window:

As long as you choose a good query condition to perform a "query" operation. As shown in the figure below:

7, watt-hour meter calibration error limit Settings

This system watt-hour meter is to determine whether qualified according to JJG 307-1988 national rules of procedures. Each load point and the watt-hour meter and power factor by type into a database error limit, by "database management" under the main menu of the watt-hour meter menu under "verification error limit Settings" menu, convenient to view and change. Settings window as shown in the figure below:

In the inspection point configuration window, just select the corresponding project, change the error limit and lower limit for the new Settings and press "Enter" button, or updates to the database.

(VIII) database of printing

Print database is divided into "print verification certificate", "print calibration record" and "print verification plan".

1. print calibration certificate

1)Preview and print all the calibration certificate

If you want to all the certificate report output in the database, can run in the main menu "print management" menu "indicating instrument", "transmitter" or "watt-hour meter" under the "print verification certificate" of the submenu of "database all instrument" menu.

2) a preview and print the query to the calibration certificate

If you want to report output specific instrument record, ok after query operations on database, and then run the main menu of the "print management" menu "indicating instrument", "transmitter" or "watt-hour meter" under the "print verification certificate" of the submenu of "database all display instrument" menu, control system will be the record of "database browsing" box shows a printout.

3)Preview and print the current verification certificate

If you would have a database record report output current, can run in the main menu "print management" menu "indicating instrument", "transmitter" or "watt-hour meter" under the "print verification certificate" of the submenu of "database current meter" menu.

2. print calibration record

1)Preview and print all the records

If you want to all the records in the database report output, can run in the main menu "print management" menu "indicating instrument", "transmitter" or "watt-hour meter" "print calibration record" in the menu of "database all instrument" command.

2) a preview and print the query to the record

If you want to report output specific instrument record, ok after query operations on database, and then run the main menu of the "print management" menu of "print calibration record" from the menu "database all display instrument", control system will be the record of "database browsing" box shows a printout.

3)Preview and print the current record

If you would have a database record report output current, can run in the main menu "print management" menu "indicating instrument", "transmitter" or "watt-hour meter" "print calibration record" in the menu of "database" in the current record.

3. print verification plan

If you want a recent will have what kind of table to a list of valid, run in the main menu "print management" menu "indicating instrument", "transmitter" or "watt-hour meter" "print verification plan" in the menu, the system will pop up validity range input window as follows:

Input the validity range after click "ok" button in the system will automatically display a verification plan listing below:

4. print setup

The default print the output of the control system of the default page size, if you want to change the paper size, can run the "print management" menu of "print setup" command, control system will automatically pop up as shown in the figure below printer Settings window:

In the Settings window, you can set the printer name and paper size (such as A4 or B5), etc.

(IX) System permissions

If you are a administrator (system defaults to the first user to administrator), and want to limit some other user permissions, such as delete, change, etc.) to the database, you can "control" menu under "permissions..." To open the window is shown below, here you can add, delete, modify users and permissions.

Note: only through the "administrator" into the system with system permissions.

Permissions as shown in figure:

As long as chooses operating mode such as "new user", then select or enter the user name in the user name, and then in the "permissions" box to select one or a combination of several permissions, as shown in the figure below:

Note: after the new users, in the next to the new user name into the control system when the password is empty, you can change the password after the access control systems.

(X) Set User Password

System default for new users do not have a password, when you enter the system as a new user, the password login window password can not enter any character in the input box to enter the system. If you don't want to other users as you enter the system, the best set personal password for yourself.

Password Settings window as shown in figure:

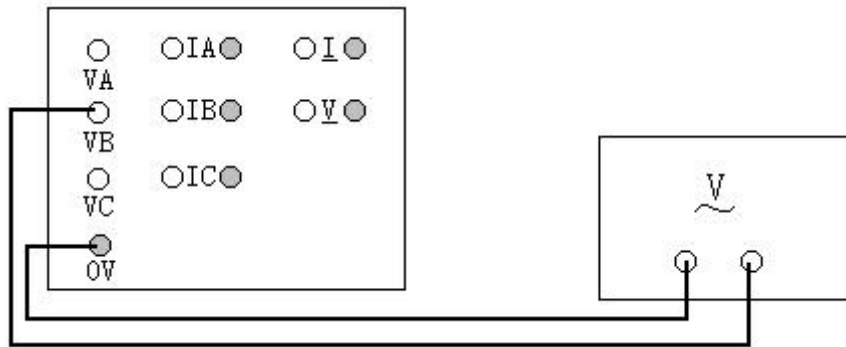
(XI) system settings

System Settings can be set temperature, relatively wet, the information such as user name. Perform "system Settings" "system Settings" under the main menu command, control system window will pop up the following Settings:

Set in the system Settings window shows the output of the information in the report.

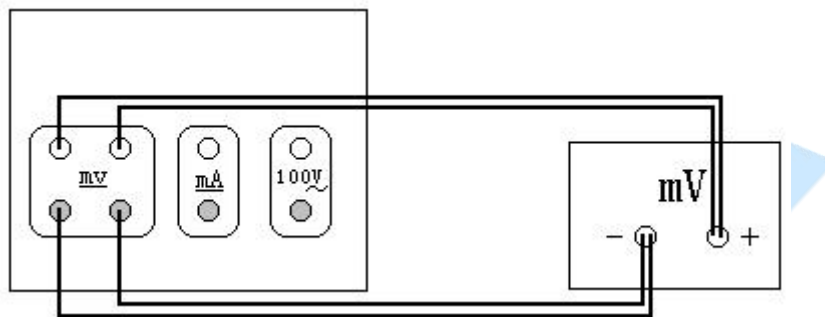
Appendix 2 various indicating instrument calibration wiring diagram

1. Ac voltmeter, frequency table

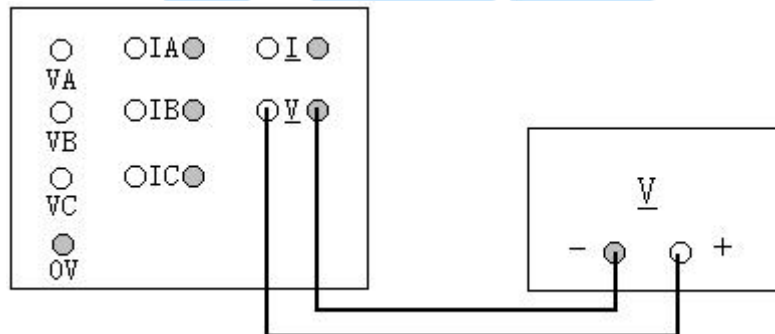


2. The mV

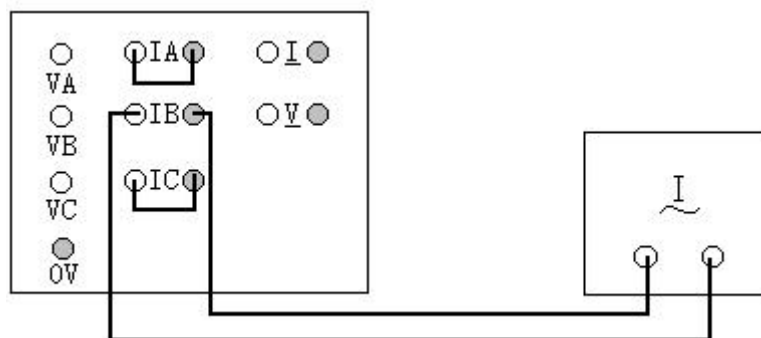
I > calibrated table types are selected as the "dc voltmeter"; II > wiring diagram is as follows.



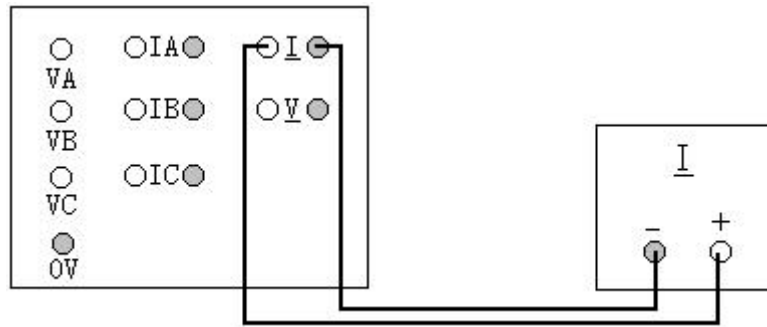
3. Dc voltmeter



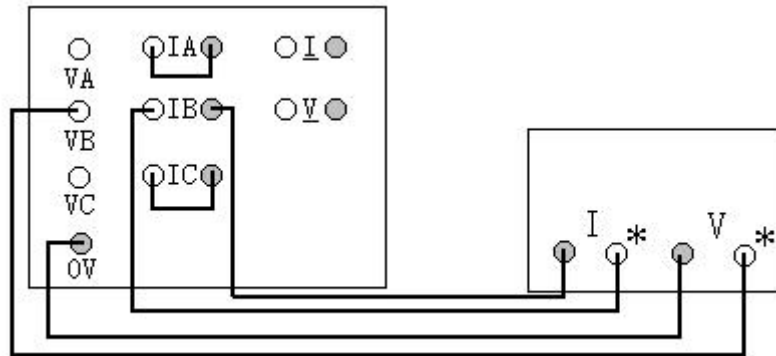
4. Ac current meter



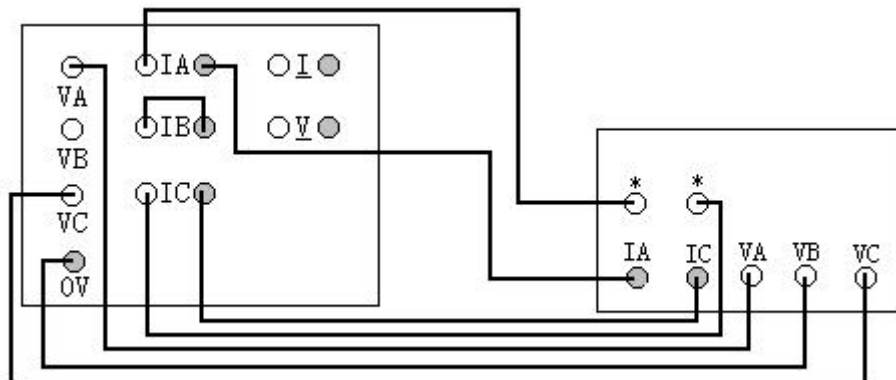
5. Dc ammeter



6. Single-phase power meter, single phase power factor meter

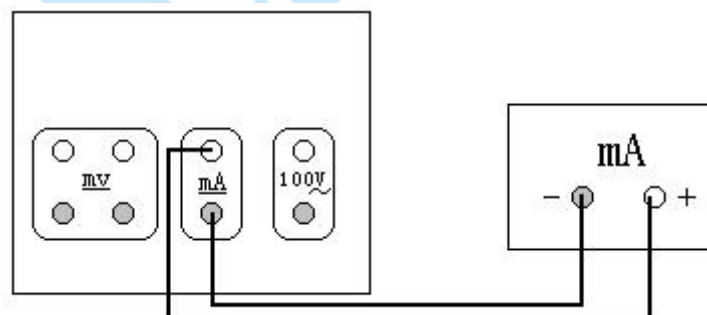


7. Mw table, mega lack table



8. mA table

I > calibrated table types are selected as the "dc ammeter"; II > wiring diagram is as follows.

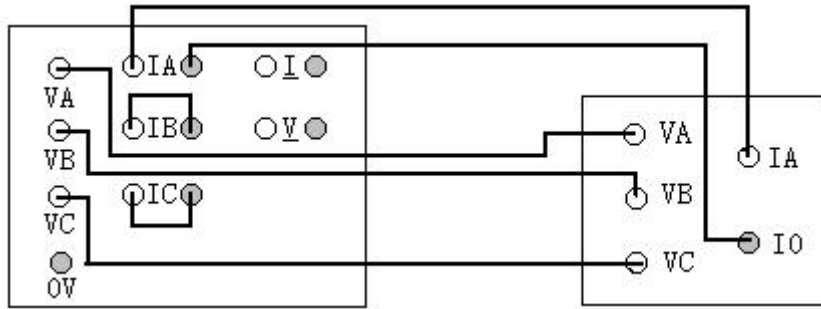


9. (single) three-phase power factor meter

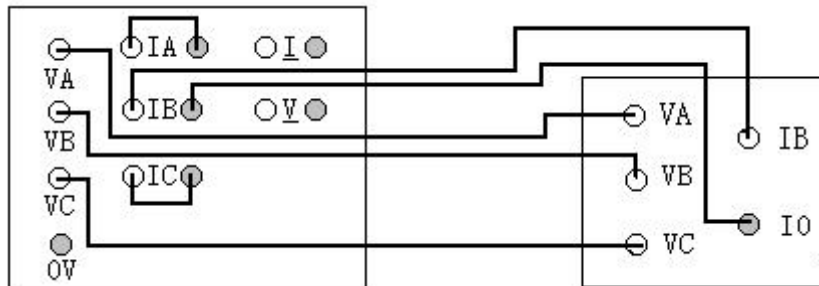
Note:

1. In addition to the necessary Settings in the "indicating instrument calibration screen", according to the current phase of the temperature, must also be in the "current" screen in current phase choice.
2. Single phase power factor meter according to the three phase four wire connection.

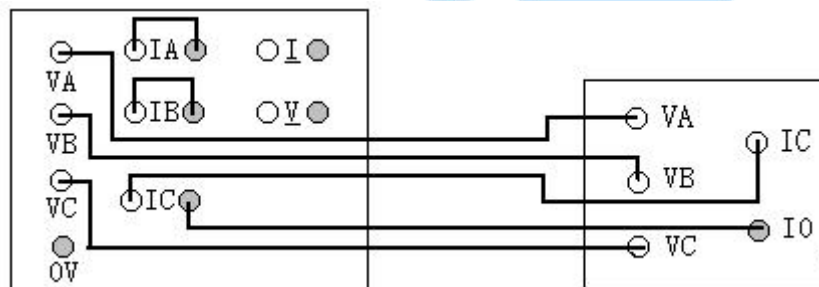
To access A current of three-phase power factor meter



10. For access to the B phase current of three-phase power factor meter



11. For access to the C phase current of three-phase power factor meter

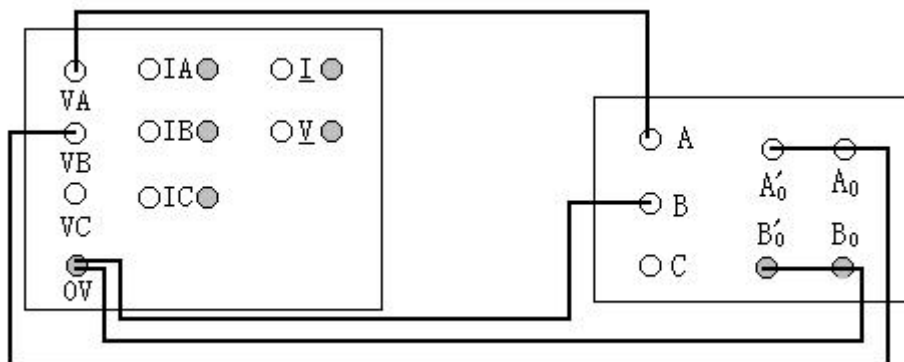


12. The same period MZ10 type combined single phase indicator

The instrument by the frequency and voltage difference, at the same time indicator of three measuring mechanism, check the table in addition to a synchronization point, poor frequency table and voltage differential gauge measurement sensitivity, also the direction of rotation flexibility, fast examination must be conducted.

(1) during the same period, the accuracy of measurement

Wiring is as follows:



Operation is as follows:

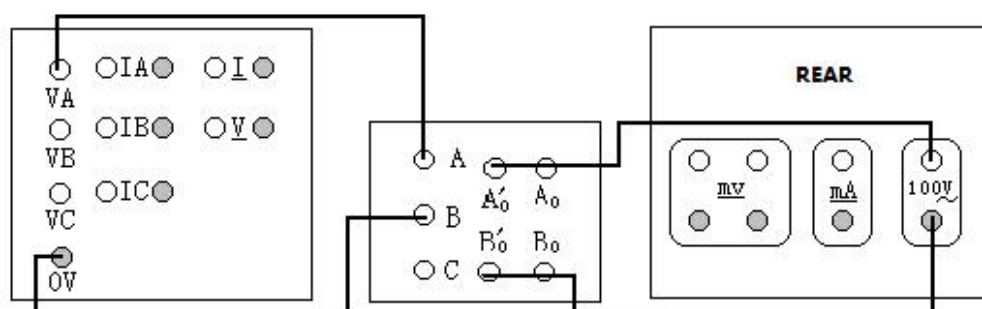
1)"Into" device check ", set "synchronous table" output way, "the 100 v voltage range;

2) tracking voltage output rose to 100%. At this point, VA, VB is of the same frequency and phase output. Frequency table pointer, pointer meter should be in the line of balance position. The same pointer should point location over the same period, the change of phase, which can realize phase shift between VA and VB.

3) split phase adjusting VA (or VB). When the $VA > VB$ voltmeter pointer should be positive end; $VA < VB$, voltmeter pointer should be biased. Respectively pointer to positive and negative maximum scale, VA, VB standard table reading value difference shall not exceed ± 3.2 V.

(2) the frequency offset and sensitivity test

The wiring diagram is as follows:



Operation is as follows:

1) into the "device check", set "single-phase synchronous table" output way, "the 100 v voltage range;

2) the rising voltage to 100 v (at this time for the output frequency of 50.00 HZ);

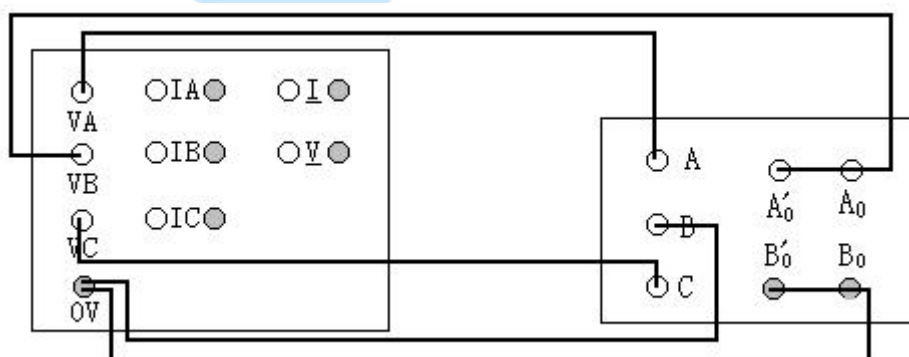
3) in a "step" adjustment mode, click on the button **F**, then click on the **3** button. Step to a value of 0.01 Hz litres to frequency ($F_s + 0.2$ Hz (F_s refers to the generator side frequency, pointer to fast direction should be continuous, sustained for more than a week without binding; click on the button **7**. Step to a value of 0.01 Hz frequency reduction to ($F_s - 0.2$ Hz), pointer direction should be continuous to slower, more than a week without binding;

4) in the "number" to adjust mode, set the current frequency to 48 hz (pointer might halt) at this time. Again under the "step" approach, to 0.01 Hz step value rises frequency to Hz (F_s), the pointer should start turning. Also, from 52 Hz frequency (pointer may halt), on frequency of 0.01 Hz step value drop to Hz ($F_s + 1$), the pointer should start turning.

13、MZ10 combined three-phase indicator

(1) At the same time point, the measurement accuracy of measurement

Wiring is as follows:



Operation is as follows:

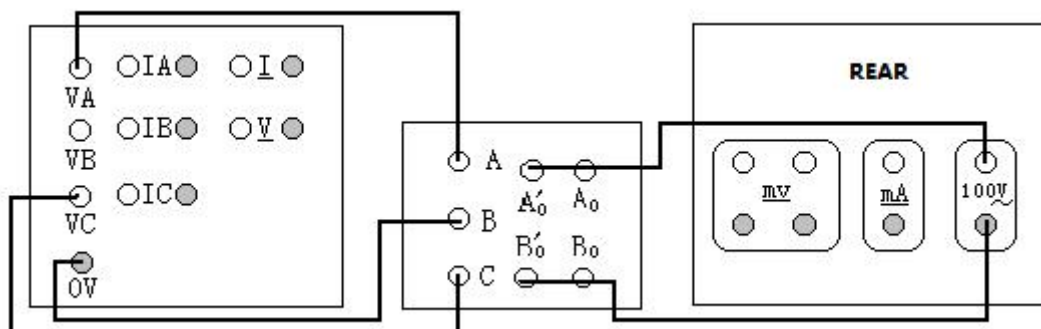
1) into the "device check", set "synchronous" output way, "the 100 v voltage range;;

2) tracking voltage output rose to 100%. At this point, VA, VB is of the same frequency and phase output. Frequency table pointer, pointer meter should be in the line of balance position. The same pointer should point location over the same period, the change of phase, which can realize phase shift between VA and VB.

3) split phase adjusting VA (or VB). When the $VA > VB$ voltmeter pointer should be positive end; $VA < VB$, voltmeter pointer should be biased. Respectively pointer to positive and negative maximum scale, VA, VB standard table reading value difference shall not exceed ± 3.2 V.

(2) the frequency offset and sensitivity test

The wiring diagram to below:



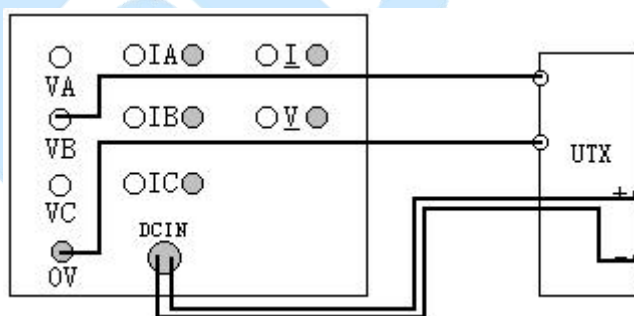
Operation is as follows:

1) click the step button to value to 0.01 Hz | frequency (Fs) + 0.2 Hz (Fs) refers to the generator side frequency, pointer to fast direction should be continuous, sustained for more than a week without binding; Step to a value of 0.01 Hz frequency reduction to (Fs - 0.2 Hz), pointer direction should be continuous to slower, more than a week without binding;

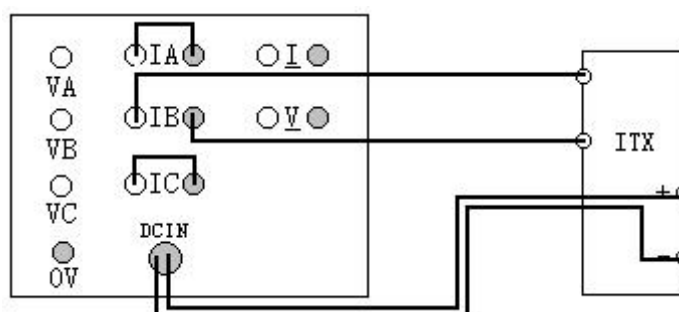
2) in the "number" to adjust mode, set the current frequency to 48 hz (pointer might halt) at this time. Click the step button again to 0.01 Hz step value rises frequency to Hz (Fs), the pointer should start turning. Also, from 52 Hz frequency (pointer may halt), on frequency of 0.01 Hz step value drop to Hz (Fs + 1), the pointer should start turning.

Appendix 3, all kinds of transmitter check the wiring diagram

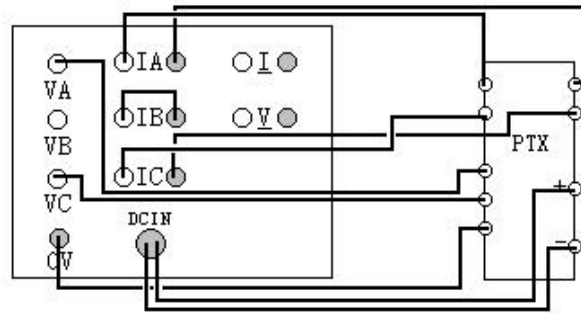
1. The ac voltage transmitter, frequency transducer



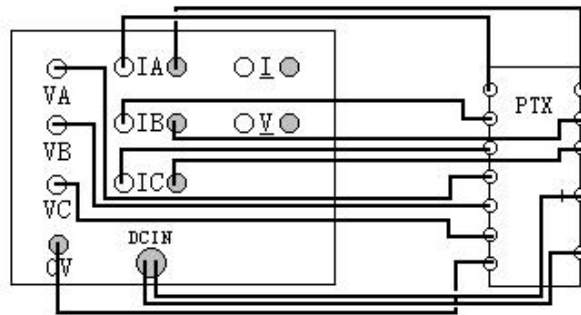
2. Alternating current transducer



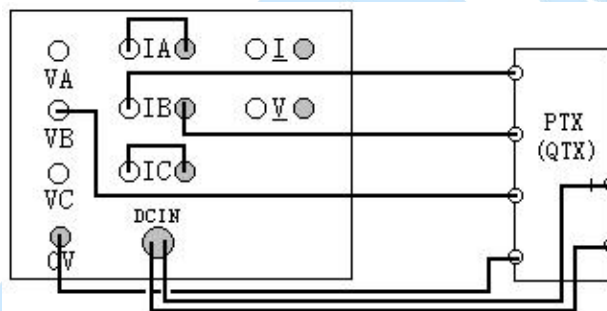
3. The three-phase three-wire active power transmitter



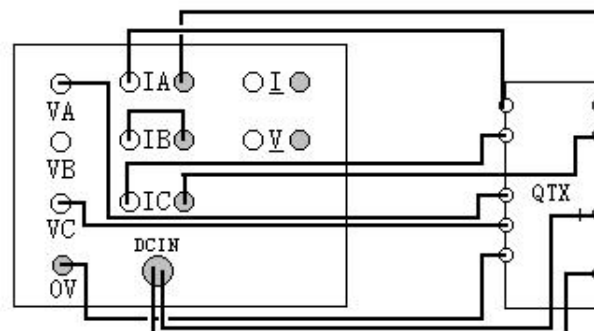
4. The three-phase four-wire active power transmitter



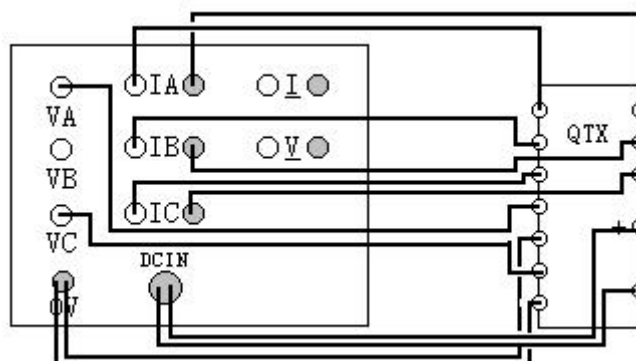
5. Single-phase active, reactive power transmitter, single phase power frequency transducer



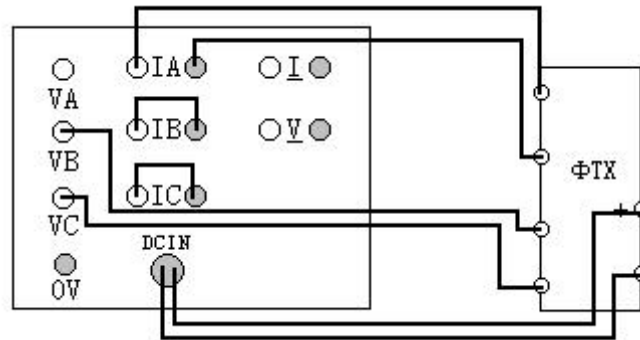
6. Dual reactive power transmitter



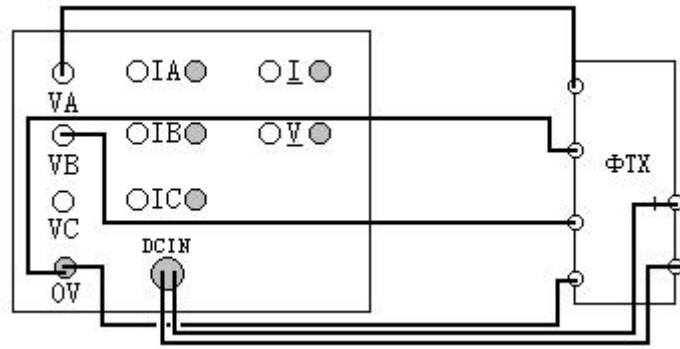
7. The ternary reactive power transmitter



8. Three phase power frequency phase transducer



9. Voltage type phase power frequency transducer



Appendix 4, common question and solution to the schedule

number	The problems and solutions
1	Boot no display.
	Can check: (1) power supply is normal; (2) whether the power cord is loose, poor contact; (3) electrical outlet that whether the insurance within the fuse box is broken, should be changed into 5 a fuse.
2	A boot, display back; In the process of using crash (any operation is invalid).
	Device under the intense outside interference occasionally appear this kind of phenomenon, belongs to the normal situation. After shutdown, wait a moment (about 1 minute) reopened, unit returned to normal.
3	The machine has no output.
	May: after startup, press the "start" button; May 2: while press the "start" button, but because of work or unstable power supply is too small, cause internal amplifier power protection. Device such as a power supply back to normal after work, will work properly.
4	Standard loss (shown as output is normal, while the standard display appear large deviation, or the code, or "00000").
	Strong interference device by the outside world, may appear this kind of circumstance. At this point, the standard recovery coefficient of the device can be returned to normal. See the manual operation device calibration "in the" recovery ".
5	Correction was carried out on the device, the fault, adjustable, resulting in big error.
	At this time, the recovery coefficient of the device can be back to the factory with state standards. Specific operation.
6	Dc high current (0.1 A ~ 25 A) no output.
	Check whether B phase current output open circuit. Dc high current output, B phase current output must be open, otherwise no dc high current output.