

PREFACE

Thanks for ordering the product of our company, and we will give the technical support and the services of the product.

Our company will give a quality guarantee of three years of the product.

Before using the product , please read the user manual to prevent from the risks of the damage to the product, and ensure the human safety. For the details ,please contact us by email or telephone.

NOTES

- ☆ please notice that it' s only allowed to work with well trained personnel and with the power systems familiar personnel.
- ☆ the connect action of the test lines should be done before supply power to the instrument.
- ☆ when the instrument is powered on ,the operator should not touch the testing circuit loop. and the ground should be well connected.
- ☆ use the original connecting line as possible.
- ☆ don' t switch the instrument on or off with the power supply connected to the system, this is to prevent accidental operation.
- ☆ Operating temperature: - 10 ° C to 50 ° C; storage: - 20 ° C to + 70 ° C. Relative humidity : 5 - 95%, without condensing.

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ONE、CHARACTERISTICS

Test indicators: Can test various domestic (imported) vacuum, sulfur hexafluoride, oil high-voltage circuit breakers, load switches, GIS grounding knife switches, contactors, relays, air switches, etc. Various data and waveforms including closing and opening time, synchronization, bounce time, frequency, automatic reclosing, stroke, speed, current, and operating voltage.

Anti interference channel: can resist static electricity interference at 550KV substation site!

Displacement channel: 1-channel displacement signal acquisition, compatible with durable precision resistance linear displacement and angular displacement sensors. It can also be adapted to users' traditional self-designed sliding resistance sensors.

Fine testing: Developed in strict accordance with the requirements of Part 3 of the General Technical Conditions for High Voltage Testing Equipment of the People's Republic of China Power Industry Standard: High Voltage Switch Comprehensive Tester DL/T846.3-2004. 10kHz high-speed sampling, with a time resolution of 0.1ms and a testing duration of up to 20s.

Operating power supply: Built in isolated digital adjustable DC power supply with short-circuit protection function, can set voltage, command various opening, closing, reclosing operations and action voltage tests.

Synchronous triggering: It can respond to various synchronous triggering methods such as voltage, current, sensor, and fracture changes.

Operation interface: 5.7 "black and white LCD screen, menu style operation, and added shortcut setting buttons on the panel.

Speed definition: Provides two modes for users to choose from: commonly used switch speed definition library and editable speed definition library.

Wave recording function: 12 ordinary metal contact on/off, coil current; Schedule and time waveform.

Waveform printing: Built in 58mm high-speed thermal printer, installed on the top panel, with clear printing of data forms and waveform diagrams.

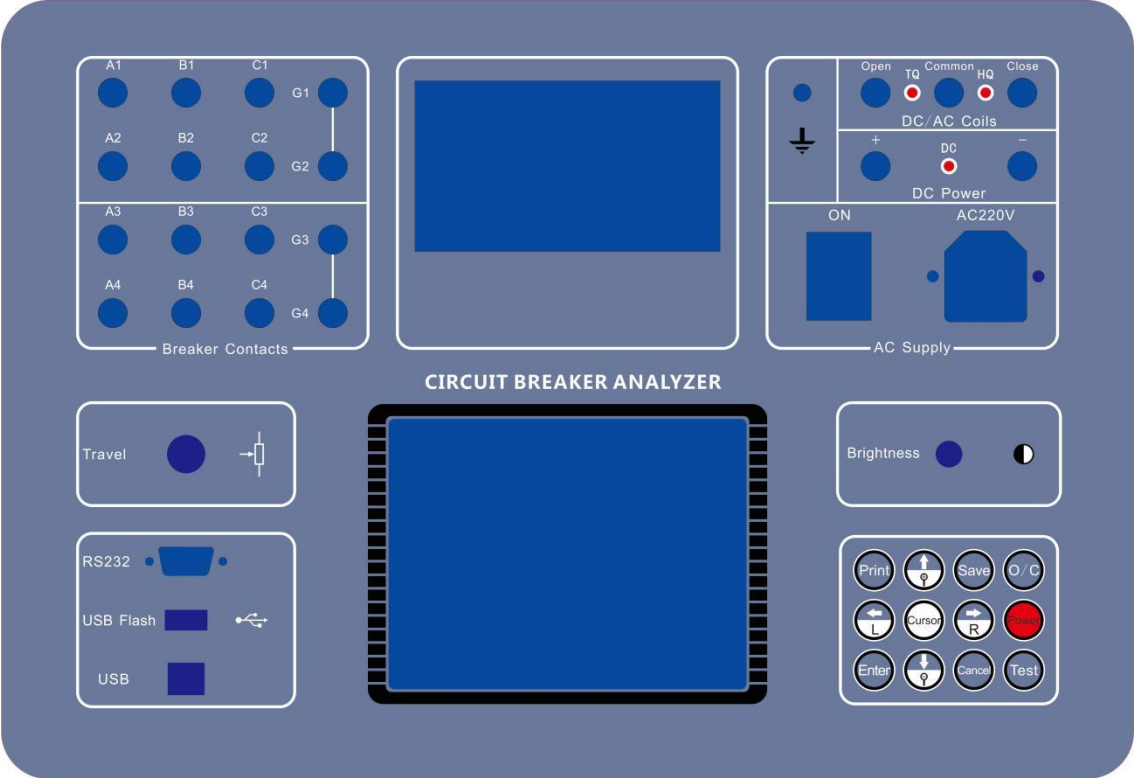
Data communication: RS232 or USB communication can be used, and PC management software can be used to upload and test data and waveform diagrams.

SD card storage: A large capacity SD card can quickly store and open records, meeting 100 test data and waveform records.

USB storage: Data and waveform files can be quickly stored on a USB drive and opened directly using upper computer software.

Online Help: The instrument is equipped with rich wiring, installation, and testing operation assistance. Easy to use without instructions.

TWO、INTRODUCTION



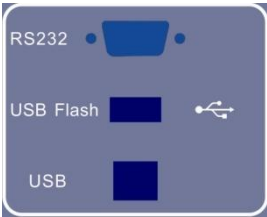
LCD :5.7" black and white lcd screen, the brightness is adjustable.

Printer: 58mm wide thermal printer .

Ground: Protective earth connection.

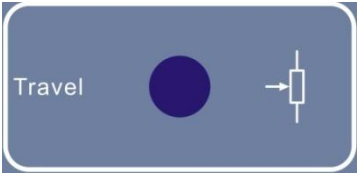
Main supply: AC220/240, 60Hz with two fuse in the box, one in use ,the other for spare use .

Communication :



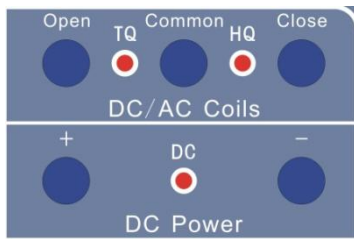
- RS232C: 57600bps.
- USB FLASH DISK: export the test results to the external usb flash disk.
- USB communication: connect to a pc via a usb cable.

Transducer :



the connector with three lines, connect the transducer to the instrument.
 Note that the transducer is combined with phase A1 only.

DC POWER:



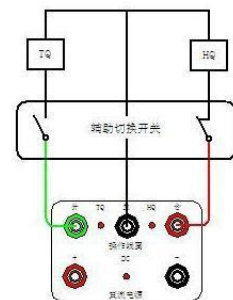
+、- outputs the internal dc power ,it' s also for the connection to an external power ,with a red led indicator. **Open , Common ,Close** are the outputs to the circuit breakers' open or close coil . with led as indication. Close or open can also be used as the external trigger.

Typical connection :

the instruments has three operation mode, internal power mode ,external power mode , external trigger mode .

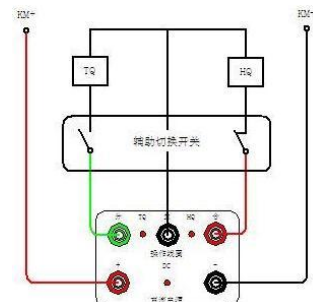
1) Internal power mode:

The internal power outputs the dc voltage directly, the voltage can be used for the circuit breaker' s coil , and can be used for the motor' s charging voltage.



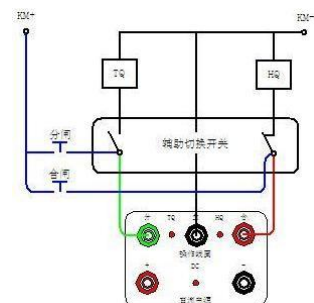
2) External power mode:

The +、- can be connected to an external dc power ,then use the external power to do the tests of the circuit breaker.



3) External trigger:













Connect the circuit breaker' s close coil and open coil to the close , open and common port of the instrument. This is the external trigger mode.



Notes : when the operation coil is ac driven mode ,the external trigger mode is useful.

CONTACTS: the contacts are used to connect the ports of a circuit breaker to the instrument.

Keyboard Specification:

	O/C	Set the operation sequence between open and close			
	Power	Turn on the internal DC power or turn off it			
	Test	Start the test process			
	Print	Print the results table and the graph			
	Save	Save the results table and the graph			
	Enter	Enter the setting			
	Cancel	Cancel the setting or return			
	Cursor	Set the graph between the screen move mode and zoom mode			
	↑ /ZOOM IN	↑	Move cursor or zoom in or out	Zoom in	Zoom in or out the graph
	↓ /ZOOM OUT	↓		Zoom out	
	← /Left	←	Move cursor or zoom in or out	L Move	Left or right move of the screen
	→ /Right	→		R Move	

THREE、 menu specifications

TEST

MENU	↑ ↓ ← → Move Select
FILE	SENSOR: <input type="text"/>
SET	CHANNELS:
TEST	A1 ● B1 ● C1 ●
SYSTEM	A2 ○ B2 ○ C2 ○
HELP	A3 ○ B3 ○ C3 ○
	A4 ○ B4 ○ C4 ○
	PARAMETERS SET:
	TESTMODE: TimeMotion Test
	SPEED DEFINITION:
	O point+6mm, C point-6mm
	SEQUENCE: O
	POWER: Inter. 220V
09-07-13	
10:33:51	

Sensor: this moving cursor indicates the location of the transducer.

Channels:

● indicates the very contact is closing ;

○ indicates the very contact is opening.

Parameters set : shows the current setting parameters.

TESTMODE: indicates the current test

program' s test mode.

SPEED DEFINITION: indicates the current test program' s speed definition.

SEQUENCE: the short key of the open or close set. This parameter can also be set from the MENU-SET-SEQUENCE.

POWER: indicates the current test program's power mode(internal power, external power or external trig mode).

SET: set the test-mode, range, transducer(sensor), speed definition, power mode, sequence, minimum trip voltage , trigger and display of the test program.

SET—TESTMODE:

SET	↑ ↓ ← → MOVE SELECT
TESTMODE	Time Test
RANGE	✓ Time-Motion Test
SENSOR	Time-Motion Test (3)
SPEED	Minimum Trip Voltage Test
POWER	Life Cycles Test
SEQUENCE	
MIN. TRIP	
TRIGGER	Note: TimeMotionTest(3) means
DISPLAY	that we calculate the other two contacts'
PMS	motion parameters and speed from one phase.
RETURN	
09-07-13	
10:32:42	

TESTMODE: the test mode title has five options, such as time-test ,time-motion test ,time motion test (3),minimum trip voltage test, life cycles test, the operator can select the very test mode as he wants .

SET—RANGE:

SET	↑ ↓ ← → MOVE SELECT
TESTMODE	
RANGE	TimeLen. : 1.0s
SENSOR	
SPEED	Sam.Rate : √ 10Ksps (0.1ms)
POWER	100Ksps (0.01ms)
SEQUENCE	
MIN. TRIP	
TRIGGER	Channels: 3
DISPLAY	6
PMS	√ 12
RETURN	Return
09-07-13	
10:32:42	

Time Length: the range can be set from 0.1 to 20.0s, this is the record time length.

SampleRate: there are two choices of the sample rate, includes 10Ksps and 100Ksps, But here supply 10Ksps only.

Channels: this is the channels of the test program, it has three choices, includes 3, 6 and 12.

SET—SENSOR:

SET	↑ ↓ ← → MOVE SELECT
TESTMODE	
RANGE	
SENSOR	SensorL. : L=050.0mm
SPEED	VerifyL. : S=150.0mm
POWER	
SEQUENCE	
MIN. TRIP	
TRIGGER	
DISPLAY	
PMS	
RETURN	
09-07-13	
10:32:42	

Sensor Length: this is the line transducer's total electrical length, the operator can set the transducer's length here.

Verify Length: this is the rotary transducer the operator can set the circuit breaker's total length(stroke) here.

SET—SPEED :

SET	↑ ↓ ← → MOVE SELECT
TESTMODE	√ 0 point+10ms, C point-10ms
RANGE	0 point+5ms, C point-5ms
SENSOR	0 point+6mm, C point-6mm
SPEED	0 point+6mm, C(100% travel)
POWER	0 point+12mm, C point-12mm
SEQUENCE	0 point+12mm, C(100% travel)
MIN. TRIP	0 point+32mm, C point-16mm
TRIGGER	0 point+72mm, C point-36mm
DISPLAY	0 point+90mm, C point-40mm
PMS	0 or C(100% travel)
RETURN	0 or C(10%-90% travel)
	0 to 90%trav., 10%trav. to C
09-07-13	0 to 80%trav., 20%trav. to C
10:32:42	To Editable Speed Definition

For the reason that the speed definition of circuit breaker maybe different from each other, the user can select the very speed definition of the test program.

(un-editable speed definition)

SET	↑ ↓ ← → MOVE SELECT
TESTMODE	√ 0 +10.0ms, C -10.0ms
RANGE	0/C point ±10.0ms
SENSOR	0 +10.0mm, C -10.0mm
SPEED	0 +10.0mm, C (100% travel)
POWER	0/C tra 10.0%-90.0%
SEQUENCE	0-tra90.0%, tra10.0%- C
MIN. TRIP	To Uneditable Speed Define
TRIGGER	
DISPLAY	
PMS	
RETURN	
09-07-13	
10:32:42	

if the operator thinks that the speed definition in the un-editable speed definition part is not suitable, then the editable speed definition part maybe useful. Of course the operator can use the cursor in the graph to analyze the speed .

(editable part)

SET—POWER:

SET	↑ ↓ ← → MOVE SELECT
TESTMODE	
RANGE	
SENSOR	
SPEED	
POWER	√ InterPower: 110V
SEQUENCE	Ext. power: external DC POWER
MIN. TRIP	ExternTrig: ext. AC/DC trig
TRIGGER	
DISPLAY	
PMS	
RETURN	Note: V ranges from 15-260V!
09-07-13	
10:32:42	

Internal Power: the operator can set the voltage from 15 to 260V. the +, - port on the instrument' s face can output the internal dc voltage as setting.

External power: if the operator select external power, then internal power is turned off automatically, the operator can connect the external power to the +, - part on the face.

External trigger: if the operator select the external trigger ,then the internal power is automatically turned off , the operator can only connect the lines from the close coil and open coil' s voltage to the face' s open , common and close , then the instrument can be triggered from the open or close coil' s dc or ac voltage.

SET—SEQUENCE:

SET	↑ ↓ ← → MOVE SELECT
TESTMODE	
RANGE	
SENSOR	
SPEED	
POWER	
SEQUENCE	O : last0300ms
MIN. TRIP	✓C : last0300ms
TRIGGER	OC : O 300ms C
DISPLAY	CO : C 300ms O
PMS	OCO : O 300ms C 300ms O
RETURN	COC : C 300ms O 300ms C
	LC : TGap020s,0100Cycles
09-07-13	Note: Close or Open time must
10:32:42	be within 9.9s!

O/C: the open or close operation' s voltage lasts XXXX ms

OC: the open operation' s recording lasts XXX ms, and then output the close coil' s voltage.

CO: the close operation' s recording lasts XXX ms, and then output the open coil' s voltage.

OCO: the open operation' s recording lasts XXX ms, and then output the close coil' s voltage, the recording time length lasts XXX ms, and then output the open voltage .

COC: the close operation' s recording lasts XXX ms, and then output the open coil' s voltage, the recording time length lasts XXX ms, and then output the close voltage .

LC: the life cycles test' s time gap and the cycles of the operation can be set here .

SET—MINIMUM TRIP VOLTAGE:

SET	↑ ↓ ← → MOVE SELECT
TESTMODE	
RANGE	
SENSOR	
SPEED	
POWER	Con. Mode: ✓ Auto
SEQUENCE	Hand
MIN. TRIP	StartVol: 030V (>= 15V)
TRIGGER	EndVol : 110V (<=220V)
DISPLAY	Pul. Step: 5V
PMS	Delay : 5s
RETURN	Jud. Mode: ✓ ContactState
	Coil Current
09-07-13	Return
10:32:42	

Control Mode: if the operator select the auto mode, then the following parameters can be set ,if the hand mode, the following parameters can not be set , the voltage can range from 15V to 260V from the panel' s keys.

Start Voltage : this is the start voltage that been added to the open or close coil.

End Voltage: this is the end voltage of the minimum trip voltage test .

Pulse Step: this is the increase step of the voltage .

Pulse Delay: this is the delay between the steps of the voltage .

Judge Mode: the instrument judges if the operation is over or not from the condition.

There are two choices:

One is to judge from the ports state, if the port states have been changed , the test is over, so the operator must connect the ports lines of the circuit breaker to the

instrument.

Another choice is to judge from the coil's current state, so the operator must connect the open or close coil to the open, common and close of the panel.

The operator can only select only one at a time.

Notes:

DC110V coil, start voltage can be set to 30V, the end voltage can be set to 110V;

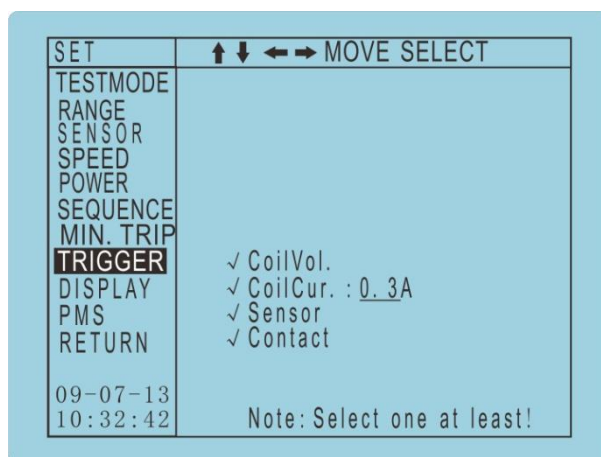
DC220V coil, start voltage can be set to 60V, the end voltage can be set to 220V;

If the steps is small, then the test time is much longer.

If the delay is large, then the test time is longer.

The test results table of the auto mode can be printed or saved, but the hand mode didn't support the save or print function.

SET--TRIGGER:

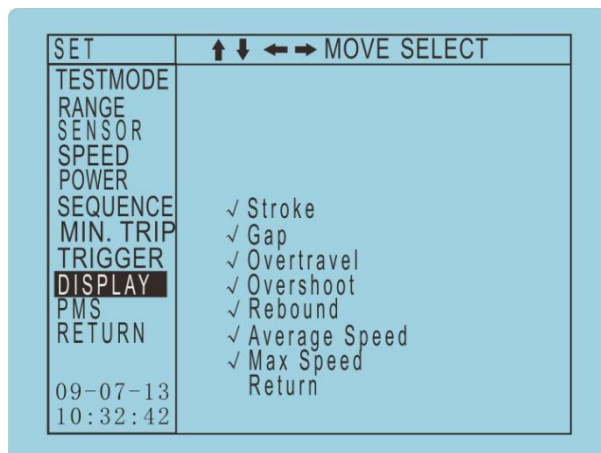


There are four choices for the trigger setting, such as the coil's voltage, coil's current, the sensor's state and the contacts' states. and the current's value can be set.

Notes:

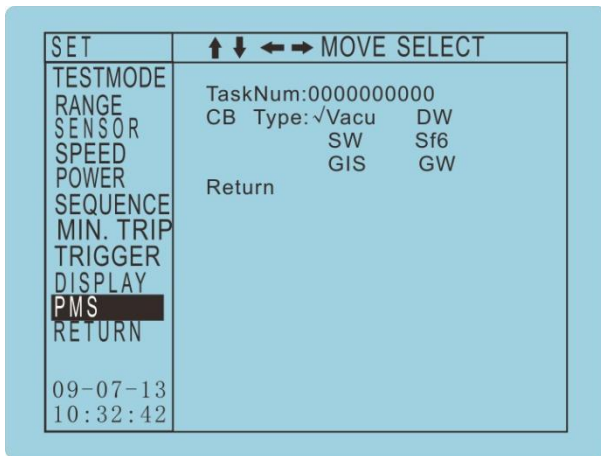
The trig set is based on the current test, so you should select as you need.

SET--DISPLAY:



The user can select the parameters to display or not display on test result table.

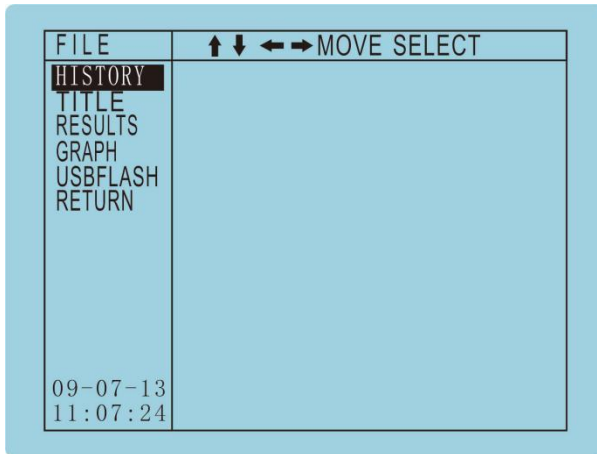
SET--PMS:



The PMS is for the ZheJiang Province' s Power System use, to send the test results to the pc terminal through Bluetooth communication.

FILE: the operator can see the history , results table , graph and so on .

FILE--HISTORY:



The operator can find , open and delete the history test results.


FILE--TITLE:

TEST REPORT	
Breaker type	
Manufacturer	
SerialNumber	
Breaker ID	1901-01-01
TestLocation	
Company Name	
Operator	
Instrument	
Reference	


this table supports the edit of the characters, numbers .

FILE--RESULTS:

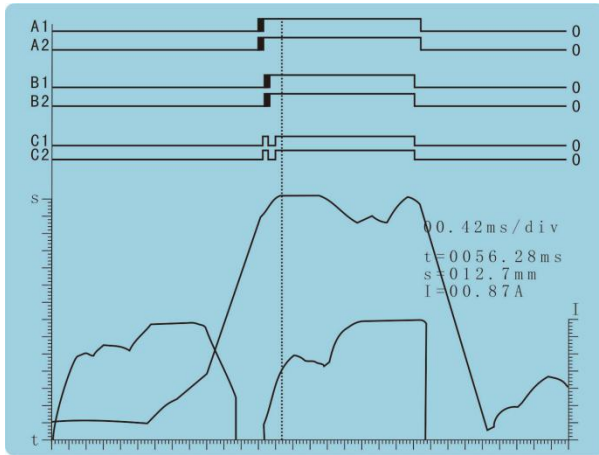
Test Time: 2009-07-08 08:59:52 (C)				
CHA.	C Time	Bouc.	Cyc.	
A1	0085.66	00.85	01	ΔA000.00
A2	0085.66	00.85	01	ΔB000.00
				ΔC000.00
				ΔABC001.00
B1	0086.08	01.66	01	Cur. Len. 065.70
B2	0086.08	01.66	01	Stroke 012.3
				Gap 011.5
				Overtra. 000.8
C1	0086.66	02.26	01	Oversho. 001.5
C2	0086.66	02.26	01	Rebound000.8
				Velocity 00.69
				MaxVelo. 00.80
Note: base ms;mm;m/s. ↓ to Graph				

Press key  , can print the test results table.

Press key  , can enter into the graph.

Press key  , can return to the upper menu.

FILE--GRAPH:



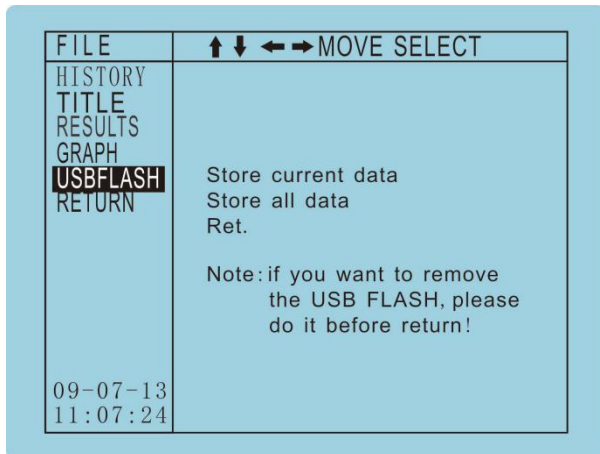
the operator can analyze on the graph:

☆ press →、← to move the first cursor , and the current cursor' s time and s are displayed on the screen; if press the enter , the first cursor is been locked; then press→、← to move the second cursor, and this time the delta time and delta s are displayed on the screen ,and the velocity is

displayed on the screen too.

☆ during the cursor moving mode ,if press the key named cursor ,then enter to the graph' s zoom mode ,so this time the operator can press the zoom in ,zoom out key to view the details of the graph ,and also the operator can press the left or right move key to move the content on the screen. If the operator press cursor key another time ,then the operation mode of the graph returns to the cursor moving mode again.

File--USBFLASH:

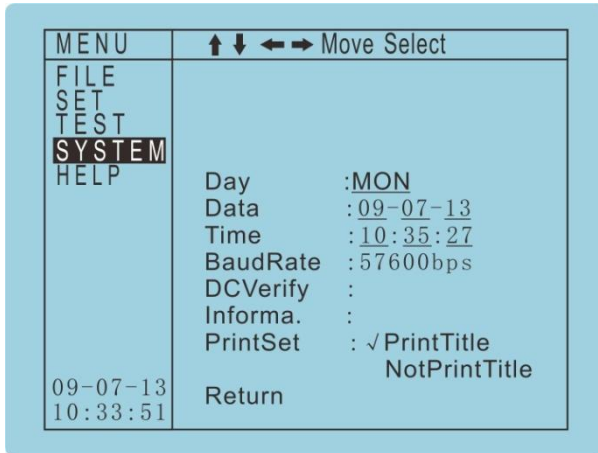


Store current data: store the current test data to the usb flash ,then on the pc software ,this test data can be opened.

Store all data: store all data in the instrument' s memory to the usb flash disk.

Return: return to the upper menu.

SYSTEM:




Day: set the day of week.

Data :set the year ,month and data.

Time :set the hour ,minute and second.

Baudrate: the baudrate is 57600bps.

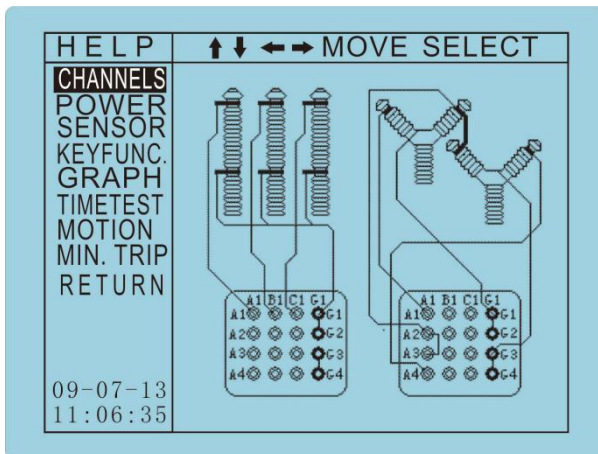
DCVerify: Press key , enter into the verification of the voltage.

Information: this is used for the debug in the factory.

Printset: this is a choice between print the title or not print the title.

HELP: this is the help topic.

HELP—CHANNELS:

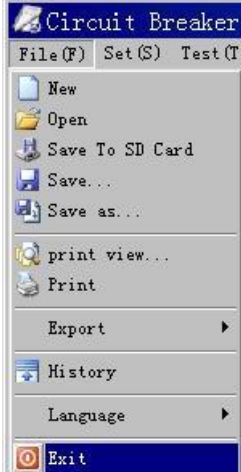


As show on the screen , the help menu displays the port connect way.

FOUR、 PC SOFTWARE SPECIFICATION

1. PC SOFFWARE MENU:

1. FILE

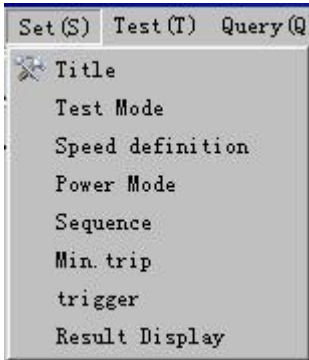


- New : create a new test.
- Open : open a test results.
- Save to SD card: give a command to the instrument to save the current test results to the internal SD card .
- Save :save the current test to the hard disk of PC.
- Save as :the function is similar to the save .
- Print preview: take a preview of the test results.
- Print : print the test results on the printer directly.
- Export : export the test results to the word or excel format.

History : can view the sd card’ s storage status and can upload or delete the results.

Exit : exit the pc software of circuit breaker testing.

2. SET MENU



- Title: the title is a test information ,it’ s editable.
- Test mode: this part has the time length , sample frequency ,test mode and sensor.
- Speed definition : it has the channels ,max speed , and the speed definition.
- Power mode : set the power mode of the test.
- Sequence : set the open , close ,open-close , close-open ,close-open-close and open-close-open .

Minimum trip voltage : set the information of the minimum trip voltage test .

Trigger : set the trigger of the test plan .

Results display : set the parameters show or not show in the results table .

2.1 Title

the operator can edit the circuit breaker' s information and the tester' s information ,these information can be stored on the pc .

title write : this means that the information can be send to the instrument ;

title read : this means that the information can be read to the software and display here .

2.2 Test mode

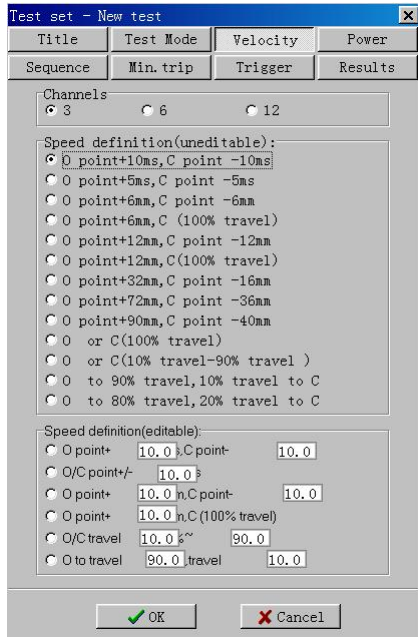
Time length : the recording time length ranges from 0.1s to 20.0s .

Sample frequency : we offer two types of instrument ,one is 10ksps ,another is 100ksps.

Test mode : the instrument has four types of test modes ,time test, time motion test ,time motion test (3), minimum trip voltage test .

Sensor : the sensor length means that the total electrical length of the linear transducer. The verify length means that using the rotary transducer(resistive), the operator should enter the stroke of the circuit breaker here .

2.3 Velocity

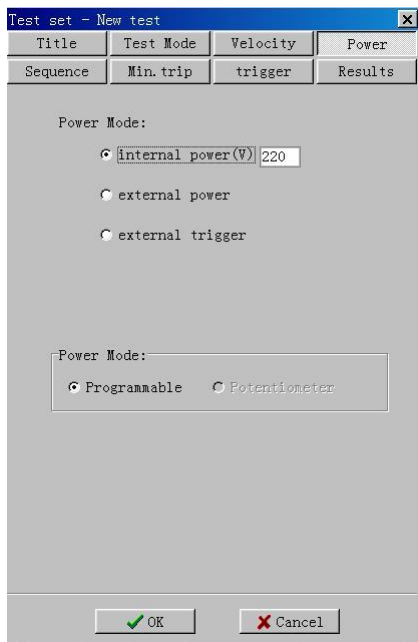


Channels : the instrument offer 3 choices ,3 ,6,12 .

The operator should select the right channels of the test .

Speed definition : the speed definition has the editable part and the un-editable part, the operator can select the speed definition of the test .

2.4 Power

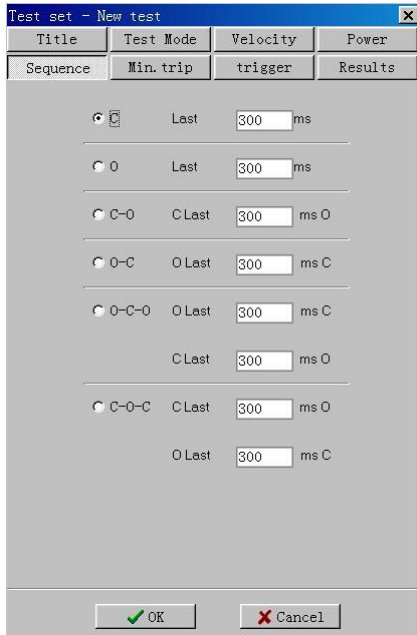


Internal power : the internal power can ranges from 15V to 250V.

External power : if the operator select external power, then internal power is turned off automatically, the operator can connect the external power to the +、 - part on the face.

External trigger : if the operator select the external trigger ,then the internal power is automatically turned off , the operator can only connect the lines from the close coil and open coil' s voltage to the face' s open ,common and close ,then the instrument can be trigged from the open or close coil' s dc or ac voltage.

2.5 Sequence



O/C: the open or close operation' s voltage lasts XXXX ms

O-C: the open operation' s recording lasts XXX ms, and then output the close coil' s voltage.

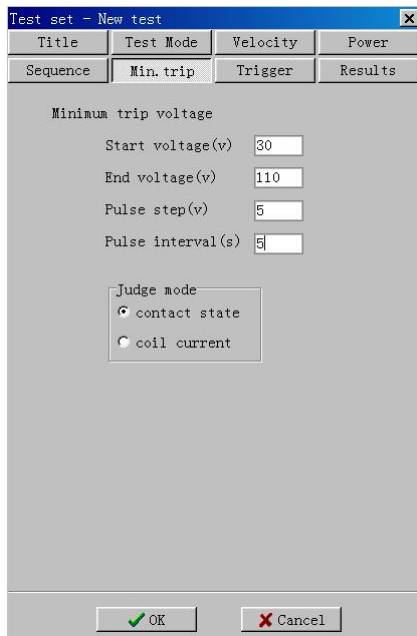
C-O: the close operation' s recording lasts XXX ms, and then output the open coil' s voltage.

O-C-O: the open operation' s recording lasts XXX ms, and then output the close coil' s voltage, the recording time length lasts XXX ms, and then output the open voltage .

C-O-C: the close operation' s recording lasts XXX ms,

and then output the open coil' s voltage, the recording time length lasts XXX ms, and then output the close voltage .

2.6 Minimum trip voltage



Control Mode: if the operator select the auto mode, then the following parameters can be set , if the hand mode, the following parameters can not be set ,the voltage can range from 15V to 260V from the panel' s keys.

Start Voltage: this is the start voltage that been added to the open or close coil.

End Voltage: this is the end voltage of the minimum trip voltage test .

Pulse Step: this is the increase step of the voltage .

Pulse Delay: this is the delay between the steps of the voltage .

Judge Mode: the instrument judges if the operation is

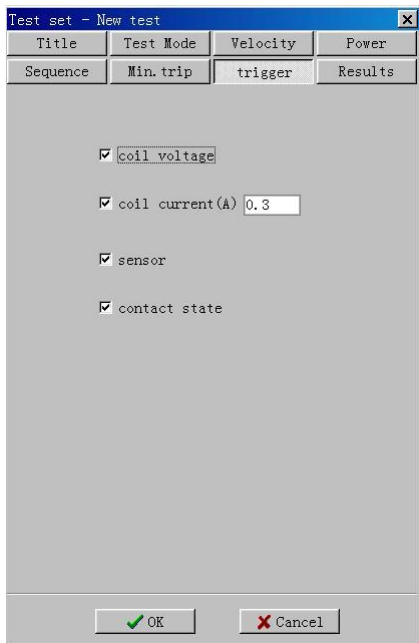
over or not from the condition.

There are two choices:

One is to judge from the ports state, if the port states have been changed , the test is over, so the operator must connect the ports lines of the circuit breaker to the

instrument.

2.7 Trigger



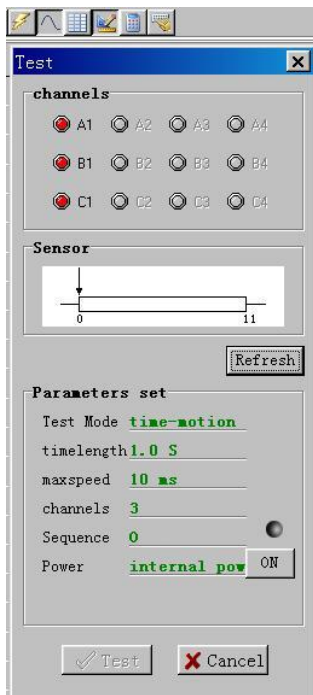
There are four choices for the trigger, such as the coil's voltage, coil's current, the sensor's state and the contacts' states. and the current's value can be set.

2.8 Results



set the parameters display or not display in the test results table .the parameters includes the following parameters, current length , stroke ,gap(contact separation), overtravel(contact separation), overshoot, rebound ,average velocity ,max velocity .

3. Test Menu



Channels :

● indicates the very contact is closing ;

○ indicates the very contact is opening.

Sensor : this cursor indicates the location of the transducer.

Parameters set :

Testmode : indicates the current test program' s test mode.

Time length : this is the recording time length.

Maximum Speed : the time interval for the speed calculation, the interval is 10ms.

Channels : indicate the test program' s channels number.

Sequence : set the operation mode , such as single close , single open or multi-operation .

Power : indicate the power mode in the test program.

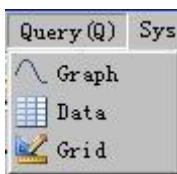
Refresh : refresh the status of the channels and the sensor .

ON : Press ON/OFF to turn on or turn off the internal dc power .

TEST : Press the test to start the test process.

CANCEL : cancel the test window.

4. Query

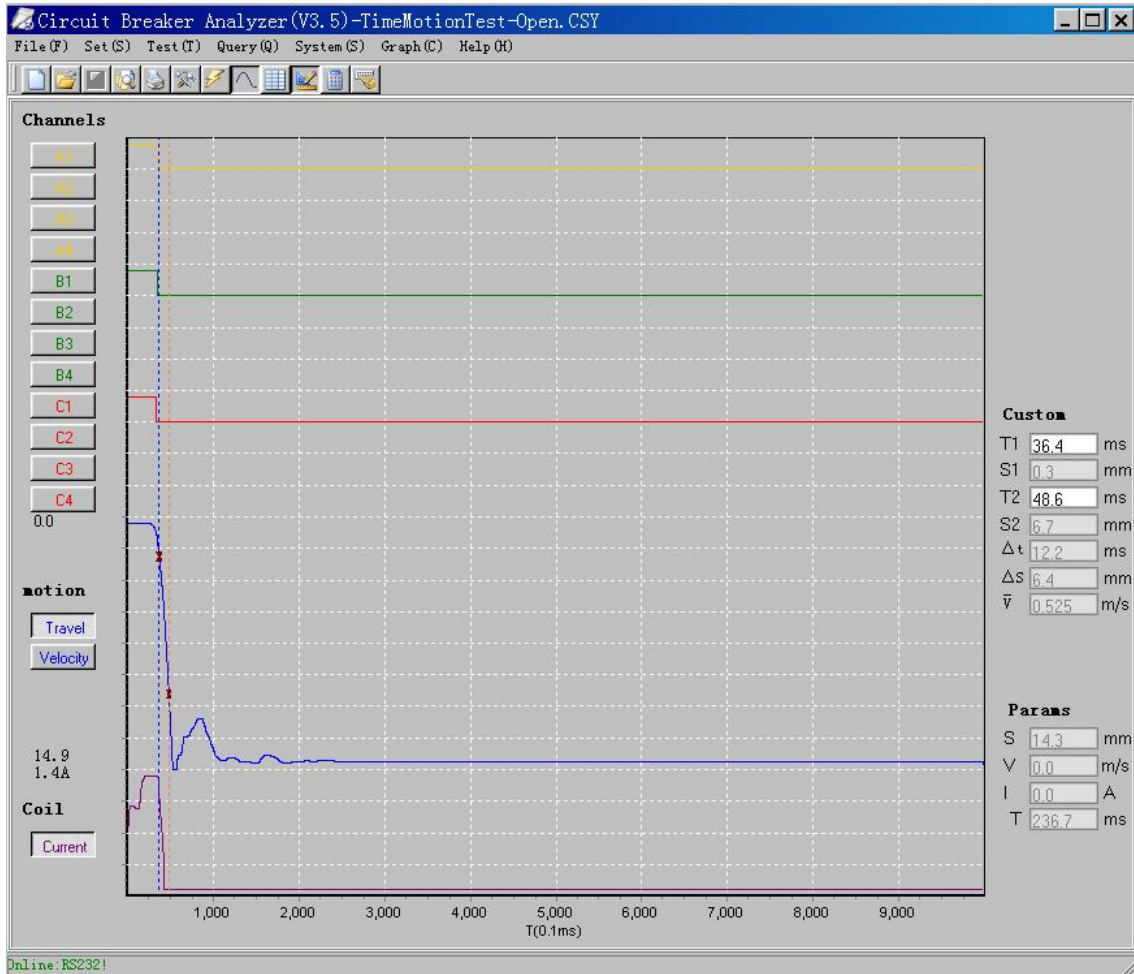


Graph : Press graph to view the graph with channels , transducer curve and the parameters.

Data : display the test results .

Grid : press it to turn on or off the cursor .

4.1 Graph



Operation of the graph

Zoom in : put the cursor of the mouse in the very area ,then drag from top-left to right-bottom.

Zoom out : put the cursor of the mouse in the very area ,then drag from right-bottom to top-left.

Cursor on :press the left key on the mouse once to put the cursor on .

Cursor off :press the right key on the mouse once to cancel the cursor .

Channels : display the selected channels' s graph.

Motion : the demo display is the time-motion graph,press **Velocity** to the graph of the velocity, press **motion** to the motion graph.

Coil current: display the current of the coil .

Time base : the time base of the x - axis .

Analysis :

Move the cursor , press the left key of the mouse once to put the first cursor(blue),then move the mouse put the second cursor(orange).so on the right of the window , the results are displayed .

4.2 Results Table

Circuit Breaker Analyzer (V3.5) - TimeMotionTest - Open.CSY

File (F) Set (S) Test (T) Query (Q) System (S) Graph (C) Help (H)

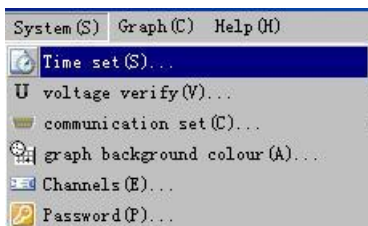
Breaker type: Company name:
 Manufacturer: Operator:
 Serial number: Test instrument:
 Breaker id: 1901-01-01 Date of test: 2012-6-21 10:40:56
 Test location: Reference:

Remarks: Time(ms), Velocity(m/s), Stroke(mm).

Open	Open Time	Bounce	Cycle		
A1	36.8	0.0	0	delta A	0.0
A2				delta B	0.0
A3				delta C	0.0
A4				delta ABC	2.9
B1	35.2	0.0	0	Current length	44.9
B2				Stroke	14.4
B3				Contact sep	14.0
B4				Contact length	0.4
C1	34.0	0.0	0	overshoot	0.5
C2				rebound	2.6
C3				velocity	0.5
C4				Max velocity	1.0

Online: RS232!

5. System



time set : set the time of the instrument or read back the time from the instrument.

Voltage verify : the verification of the internal power.

Communication set : set the communication mode (usb or rs232 , and the 232 port number).

Graph background color : set graph' s background color.

2. Short Keys



Create a new test



Open a test of history



save a test



preview of the test report



print the test report with the results table and the graph



set



test



display graph



display the results table



cursor on or off



open the calculator



open the keyboard

Five、 Technical specifications

Test channels: 12 channels with 25V, the current is 50mA

Transducer: one analog transducer .

TIME:

Recording time length : 0~20.0s
Time accuracy : $\pm 0.1\%$ reading ± 2 LSB
Resolution : 0.1ms

Motion:

Range : 0~1000mm
Accuracy : $\pm 1\%$ reading ± 1 LSB
Resolution : 0.1mm

Velocity :

Ranges : 0.01~20.00m/s
Accuracy : $\pm 1\%$ reading ± 1 LSB
Resolution : 0.01m/s

DC POWER :

Ranges : 5~260V
Max current : 20A
Accuracy : $\pm 1\%$ reading ± 1 LSB
Load change : $\leq 1\%$

TRIGGER:

Voltage : 15~260V
Current : 0.1-20A
Tranducer : the transducer states changes
Channels : channels states changed

DIMENSIONS : 380mm×262mm×120mm

WEIGHT : 8kg

OPERATION TEMPERATURE :-10℃~50℃

HUMIDITY : $\leq 80\%$ RH

POWER SUPPLY :

Voltage: AC 220V $\pm 10\%$
FREQUENCE: 50Hz $\pm 10\%$
OR(240V60Hz) Customizable

SAFETY :

Insulation resistance $> 2M\Omega$
Leakage current $< 3.5mA$
Immunity :AC 1500V 50Hz, 1min.