

Operation Manual

JYK-II Circuit Breaker Timer & Analyzer





1.1 Environment	3
1.2 Security	3
1.3 Basic parameters	3
2.the performance characteristics	3
2.1 Performance	3
2.2 Features	4
3.The definition of terms	4
4. Panel layout	5
5.Field Wiring	6
5.1 fracture signal wire	6
5.2 Closing and opening control wire	7
5.2.1 Internal trigger internal power control wiring diagram	7
5.2.2 External trigger external power connection diagram	8
5.3 Sensor installation	9
5.3.1 Acceleration speed sensor (Universal speed sensor, optional)	9
5.3.2 Rotation sensor	10
5.3.3 Linear Sensor	11
5.3.4 The laser sensor (optional)	11
6.Menu operation	12
6.1 Main menu【Set】	. 12
6.2 Main menu【Test】	15
6.3 Main menu【View】	. 18
6.4 Main menu【File】	20
6.5 Main meny 【About】	21
7.The matching equipment and service	21
8 .Field wiring and the matters needing attention	. 21
8.1 safety preparations	21
8.2 Field wiring	. 22
8.3 The test finished clearing	. 23
9.Common technical problems and approaches	. 23
9.1 A scene with the instrument control, open close gate operation	23
9.2 the switching mechanism exists to protect locking (such as Siemens, ABB switch)	24
9.3 the instrument to do a single open, a single close test, the switching action	24
9.4 the instrument together to do a single test	25
9.5 the printer can take the paper but cannot print text, graphics,	25
10.Technical Q & A	25
10.1 the instrument site grounded, why the first ground line	25
10.2 how to determine whether the normal instrument port?	26
10.3 what is just open (close) speed?	26
11. The instrument submission	27

1 .The product technical parameters 3

1.Technical Parameters

1.1 Environment

Input Power:	$220V\pm10\%$	50 Hz $\pm10\%$	Atmospheric pressure:	86 \sim 106kPa
Temperature:	-20∼45 ℃		Humidity:	≪80%RH

1.2 Security

Insulation resistance: $> 2M \Omega$ Dielectric strength: 1.5KV power on the chassis power frequency withstand voltage for 1 minute, no flash-over and arcing.

1.3 Basic parameters

- Time: 0.1ms; resolution range 64000.0ms; error \leq 0.1% read \pm 0.1
- ◆ Speed: Range 20.00m / s; resolution of 0.01m / s; error ≤ 1%read ± 0.1
- Range:

	Range	Resolution	Error
Vacuum Circuit Breaker	50.0mm		
SF6 Breaker	300.0mm	0.1mm	\leq 1%read \pm 1mm
Oil Circuit Breaker	800.0mm		

- Coil Current: Range 30.00A resolution 0.01A error $\leq 1\%$ read ± 1
- ♦ Output Power: DC0 ~ 270V digital adjustable / 20A Resolution 1V error ≤ 1%read± 0.5
- ◆ Size & Weight: 340mm (L) × 240mm (W) × 210mm (H) 10.3kg

2. Performance Characteristics

2.1 Performance

• Time: 6 fracture inherent points, closing time, with the same period of inter-phase period.

• **Reclosing:** Each fracture together close -open, open-close, open-close-open. Metal short time, no current interval time value.

• Bounce: Every fracture closing bounce time, number of bounces, bouncing process, bouncing waveform; each fracture break bouncing amplitude.

- Speed: Just minutes, just close speed, maximum speed, and time trip characteristic curves. Stroke: total trip, opening distance, overshoot, and overshoot stroke rebound amplitude.
- **Current:** Open, close gate coil current, resistance and current wave-forms.
- **Operating voltage**: DC0 ~ 270V/20A machine provides a digitally adjustable power circuit breakers, high voltage circuit breaker automatically complete action test, measuring the value of the operating voltage printed circuit breakers.

2.2 Features

- Instrument IPC architecture for domestic production of all models of metal contacts SF6 switchgear, GIS combination of electrical, vacuum switch, oil switch and column switches, contacts and so on.
- Sensor: Acceleration speed sensor, rotation speed sensor, linear stroke sensor installation is very easy and simple.
- Trigger: The trigger, external trigger, the sensor is triggered. Sensor can trigger the circuit breaker manually switching characteristic test, such as a manual column pole division switch.
- Host big screen, straight-through, wide temperate backlit LCD, contrast electronic adjustment. Perfect full Chinese menu prompts, switch action once all the data and waveform display maps. Host can store 100 groups live points, closing test results, real-time clock inside, easy to archive storage test date and time.
- Instrument has a powerful data analysis capabilities, to the circuit breaker parameters of the mechanical properties of the indicators for effective analysis. Built-in fast micro-printer, print all data and maps.

3. The definition of terms

• Open (Close) gate time:: minute open(close) tripping coil power as the starting time, the dynamic and static contact just minutes open(close) of the time.

• With the same period: The same phase among the open (close) opening time difference between the maximum and minimum.

• Interphase period: Three among the open (close) opening time difference between the maximum and minimum.

• Average speed: Open (close) gate process, the moving contacts total stroke before and after each take 10%, to take the middle 80% of the moving contact sport stroke versus time.

• Maximum speed: Open (close) gate process, the moving contacts begin to exercise, take the moving contact sport every 10ms as a speedometer unit until stopped moving contact sport, get the value of a number of speed units, the largest unit speed value is the open (close) brake maximum speed.

• Just minutes open(close) Speed : According to the manufacturer the test switch different switch models, the various manufacturers define different just open(close) speed

O 10 ms before close or after open: IEC standard, part of the oil switch and some SF6 switch;

O Before and after open and close 5ms: Part of the oil switch;

O LW8-35: LW8-35 type SF6 switch;

- O 10% to fracture: Xi'an Switch Factory production part of the SF6 switchgear;
- O ABB-HPL245B1: ABB's 220kV SF6 switch;
- O LW6: LW6 type SF6 switch;
- O Average speed: Shenyang Switch Factory production part of the SF6 switchgear;
- O LW33-126: LW33-126 type SF6 switch;
- O Before close or after open 10mm: Part 35KV vacuum switch;
- O Before close or after open 5mm: Part 10KV vacuum switch;

As mentioned several definitions are not being used, the user can test the instrument in accordance with the measured travel time curve (stroke directional), Just minutes open(close) Speed, sampling rate segment, the instrument automatically calculates the user-defined Just minutes open(close) Speed(sampling period of time than the trip).

4. Panel Layout



No.	Panel logo	Description
1	Protective earthing terminal	contact with the earth (GND)
2	A1 B1 C1 A2 B2 C2 A3 B3 C3 A4 B4 C4	12 Roads fracture measurement channel
3	Internal trigger	connect "internal trigger" socket, the machine provides sub-gate control power;
4	External trigger	external trigger mode, directly and received points, co-ends of the coil, the coil taken as a signal synchronization signal
5	Energy St	Output DC0-270V
6	Sensor	speed sensor signal input

7	USB	USB			
8	power switch	power input 220V \pm 10% 50Hz \pm 10%			
9	printer	Print test reports and curve			
0	Function key	 Left and right to move the cursor move the cursor or increase, decrease the value at the current cursor oK select the current menu or confirm the operation Return return to the previous menu or cancel the operation Reset instrument reset 			
1	LCD display	large screen, wide temperate, backlight LCD, displays all data and maps			

5. Field Wiring

Special Safety Tips: Instrument to the scene, Please first instrument to protect the earth connection with the site, prior to all other wiring and operation after the test, turn off the power to the instrument, and then split the other line, and finally removed the ground.

5.1 fracture signal wire

Fracture wiring diagram (three fracture)

For the three fracture switch, the switch can be grounded at one end, a termination signal test taken fracture, but can not make the switch to ground at both ends, otherwise unable to complete the test. Fracture wiring diagram (six fracture)



For the six fracture switch, test, must ensure that the switch is not grounded at both ends phenomenon, otherwise unable to complete the test.

5.2 Closing and opening control wire

A closing and opening control mode switch test is divided into two kinds: internal trigger internal power supply mode and the external trigger external power supply mode. Test of two kinds of methods can only choose a way.

5.2.1 Internal trigger internal power control wiring diagram

Note: You must disconnect the measured control power switch in the control box (usually the control box is connected to control power and control bus insurance unplug), but do not cut off the power switch mechanism storage, or switch does not automatically store energy.



Tip: internal instrument can only provide DC power supply, with the internal trigger use of the internal power of the instrument. If ta switch is AC current operation mechanism, please use the external trigger mode.

5.2.2 External trigger external power connection diagram

The control power supply external trigger external power is the use of field circuit breaker system itself for switching power supply. The panel internal trigger 3 core flight control power output not wiring plug. It will be 2 core boat is inserted in the opening or closing coil as follows the line of control:

The single open test switch (switch is in the closed state), external trigger two lines should connected with both ends of the brake coil;

The single close test switch (when the switch is in a closing state), external trigger two lines and ends in the closing coil;

Tip: use the external power supply operation, use external trigger mode. The external trigger mode regardless of switching mechanism is AC or DC can be tested. The use of external trigger, trigger line connected, instrument set external trigger mode, then operating instrument closing or opening, so that it is waiting for the signal state, appeared the following interface:



This time can operation of circuit breaker button electric closing and opening, switch, instrument will appear the measurement results.

5.3 Sensor installation

The instrument is equipped with three kinds of speed sensor, respectively, in different circumstances. Three kinds of sensors used in a sensor signal lines are connected to the instrument of the "sensor" socket.

5.3.1 Acceleration speed sensor (Universal speed sensor, optional)

The speed sensor typically used conventional slide resistance or photoelectric sensor (optical encoder sub-gratings and two kinds), which two types by the moving and stationary parts. Speed, the switches are respectively mounted on the moving part (the moving contact or the lift lever) and a stationary member (the cap base or switch base), but also with the better. Thus, for different switch on the need to produce a lot of different mounting bracket, on-site installation and removal is very difficult.

Our company after years of research, for the first time will be measured acceleration technology used in switching speed, the solution of the switching field speed sensor installation is difficult, with difficulty, testing difficulty technical problem, because on-site installation convenient, simple, easy to operate, so the acceleration speed sensor also known as Universal I sensor.

Universal sensor mounting tips:

The universal sensor fastened directly to the lift rod installed in the switch, or horizontal connecting rod, or other drive rod.

Installation Note:

- 1: universal sensor socket should be directed to the same direction of movement of the actuator rod, try to keep the lever parallel. If you pretend to skew may cause the measured data are not allowed.
- 2: Universal sensor mounting rod thickness should be based on different selection of cards corresponding radius of the sensor is firmly stuck in the moving rod, cannot shake. Switching operation, the sensor lever should immediately move together, not with lever between the relative shaking, or can cause the test data are not allowed.
- 3: The universal sensor installed in the switch movable lever, the switching operation, the sensor should be left up and down around a certain position space, does not cause the sensor during the movement and the surrounding switch part collision damage.



5.3.2 Rotation sensor

Universal sensors for linear motion sensor for tachometer, some switches, especially the import and joint switch, linear transmission parts are enclosed in a switch body inside, universal sensors cannot find the installation site. Switch manufacturer's factory doing speed tests, the switching division indicator or a test rotating shaft, in which case use a rotation sensor.



Installation Note: The axis of rotation sensor should be kept concentric with the axis of rotation switch, otherwise hinder the rotation sensor, the measured curve burrs heavy, affect the accuracy of the test data.

5.3.3 Linear Sensor

If you need to very accurately measure the stroke of the switch, you need to use the travel sensor. Also called linear sensor stroke sensor, commonly used in three models, namely 50mm, 200mm and 300mm.

50mm linear sensor for the measurement of vacuum switch; 200mm, 300mm stroke for SF6 switch, velocity measurements, and these two specifications for non-standard configuration. To a certain type vacuum switch, for example, as shown below. Linear sensor during installation, to ensure that the sensor axis of motion to linear motion, magnetic universal holder with fixed sensors. For SF6 switch, oil switch, install a similar way.

Tip: stroke sensor cumbersome nature of its on-site installation, this product is not conventional accessories. Users may need for different switch mounting bracket of their own design, keep the sensor lever and switch dynamic Parallel and synchronous movement of the contacts, can be very accurately Measure the movement of the switch and the corresponding travel speed.



5.3.4 The laser sensor (optional)

The laser sensor interface for 4 core air plug, use of internal 12V power supply, the output 4-20mA signal, and

then the computer processing, direct measurement of range of motion. Sensor ranges of 30mm, 80mm and 200mm. The laser sensor installation, select the appropriate reflector can be.

6. Menu operation

Turn on the power button, press [OK] key to adjust the LCD contrast until the best results. Press [OK] key

enter the main menu interface instrument.

View Test	: Set File About 11:36:40
Curve AllData Bounce Analysis TestInfo PrintAll Print	Welcome to use AJT-TP3 c characteristic testing rument circuit breaker
	VER:4.4.0

Top of the screen for the instrument operation main menu, from left to right [View], [Test], [Set], [File], [About] five main menu, Highlight Department said the location where the cursor is currently.

6.1 Main menu [Set]

Before the test, the instrument settings for various operating states.

6.1.1 **[**Test Set]

Trigger:

Inter Trigger: Instruments internal DC power supply control switch opening, closing operation;

External Trigger: DC power supply inside the instrument does not work, use the on-site power supply (AC-DC can be) operated switch action. Switching operation, the instrument taken from the coil voltage signal for starting time.

Sensor Trigger : Instrument sensor action as the starting time for the column switch or other manually open close gate operated switch earlier, speed and other parameters tested

Time Step: Operating voltage of an internal power supply output length of time.
 250ms: General switch single open, single close trial, the election 250ms duration;
 500ms: General switch single open, single close trial, the election 500ms duration;
 1000ms: Old generator outlet switch as SN4-10G, SN4-20G's closing time is generally greater than 500ms,

make this switch single open, single close test, choose 1000ms duration;

2000ms: Switch to do "open - close - open" operation, the election 2000ms duration; **4000ms and above:** Pressure isolation switch test or other application

- 2 **Sensor Inst:** According speed sensor mounted in different positions to select.
- ③ **Sensor Type:** Accelerometer, Rotation and linear sensors are three options.
- (4) **Stroke Test:** Linear sensor, if need be measured simultaneously switch trips, it must be this open; Accelerometer, Rotation sensor, it will be this close.
- (5) **Stroke Set:** Accelerometer, Rotation sensor, the input value of the total travel of the switch. Linear sensor test switch trip itinerary will be set to switch total stroke; linear sensor with speed, but also measuring switch stroke parameters, then the time to set the input sensor label stroke stroke value.
- (6) Speed Set: Several instruments have been cured 10 speed is defined (Note: This 10 several definitions may need to use a PC to redefine the instrument and cured), depending on the switch model, select the appropriate definition. If you can not find the appropriate definitions, general admission "before close after open 10ms" (IEC standard) measured "Time stroke characteristic curve" on the curve and then the corresponding velocity values corresponding analysis.
- (7)

The following options are expressedBehind C O 5ms:Behind close or open 5msB C A O 6mm:Before close or after open 6mmB C A O 10mm:Before close or after open 10mm

8 Line Number: Mainly used to edit a data directory, the test data stored in different directories.

Prompt: Press [OK] key enter submenu, then press [OK] key when under the sub-menu on the right shows the contents of the bars. At this time, we can use , key coordinate



key to change setting. When all setup complete, Move the cursor to the bottom of the screen

[Save], and then press [OK] key to complete all settings.

6.1.2 [Voltage]

According to the site need to set the operating voltage of the switch, such as DC220, DC110V. Specific methods of operation LCD screen interface reference text prompts.

— Storage Control —
Voltage :DC 220 V
press \leftarrow , \rightarrow button coarse voltage, press \uparrow , \downarrow keys to fine tune voltage; [OK] key storage output, [Return] key to return.

6.1.3 【Time Set】

Date and time the factory has a good tune. If needed, a key select the appropriate content. Then press [OK]key to save, [Return] key exit.

6.1.4 [Para Opt]

[•] selected, **[**] unselected, Shielding parameters.

6.1.5 [State]

Detecting rotation sensor is working properly, the installation is reasonable. Specific detailed LCD text



6.1.6 [Energy St]

Storage power 2 core flight inserted the red line connected to the positive electrode, the black line is connected with the negative pole. Instrument output adjustable DC power storage 0-270V, follow the on-screen prompts.



6.2 Main menu Test

After setting the instrument to carry out tests. Use down moves the cursor to the [test] menu, as shown below:



6.2.1 [Short]

Check closing opening control line is not good or not, there is no wiring circuit error or not.

6.2.2 [Auto Test]

Instrument automatically determines the switching state of fracture do closing or opening test, the fracture line must be connected.

	est ·										
0、	vol	tage	e	:	220	V					
1、	Tri	ggei	r	:	Inte	erTı	rigę	jer			
Z١	Dura	atio	on	:	250r	ns					
3、	Sen	sor	Inst	t:	A						
4、	Sen	sor	Type	::	Rota	atio	on				
5、	Stre	oke	Test	t:	Clos	se					
6、	Str	oke	Set	:	50	. Omr	n				
7、	Spee	edSe	et	:	IEC	10r	ns				
8、	Line	eMun	nber	•:	L000	0000	90				
A:	1 B1	C1	AZ	BZ	CZ	A3	B3	C3	A4	B4	C4
0	0	0	0	0	0	0	0	0	0	0	0

Note: There is short circuit detection function default. If you don't like this function. Enter [About] menu, see the copyright information. Press key and key, release the button when prompted, then press [ok] key. Reset or shutdown, short-circuit detection function of automatic recovery. Following the same content don't explain!

6.2.3 C-Test], Open Test

Switch single close, single open test. Test results are as follows:



6.2.4 **[**O-C**]**

Switch "open - close" test, setting "open-t2-close" control interval after the test, the switch directly opening time, no current time value.



	U			no	1	
A1	5.	9	5 S	5	B.0	
B1	5.1		58.8		8.8	
C1	5.	4		5	9.2	
AZ	4.7			5	9.5	
BZ	4.8			5	9.3	
CZ	4.	9		5	9.1	
Re- spe	-C eed					

ι.

6.2.5 **[**C-O **]**

Switch "close - open" test, setting "close-t1-open" to control the time interval after the test, the switch directly closing time, the value of metal short. Test results are as follows:

6.2.6 **[**O-C-O**]**

Switch "open - close - open" test, setting "open-t2-close-t1-open" to control the time interval after the test, the switch directly opening time, metal short time, no current time value.

Note: The control interval t1 is the time from power on to play for closing coil opening coil power during this length of time, control the time interval t2 is the time from power-on to the opening coil power play to give the closing coil this length of time. For the "close-t1-open", "open-t2-close", "open-t2-close-t1-open" operation, the control switch is set to the time interval t1 proper time, with a considerable switch closing time, control time opening interval t2 is set to the proper time, and the switch opening time considerably.

6.2.7 【C Low Jump】、【O Low Jump】

Closing, opening automatic low-voltage action test, enter the interface, according to the instrument's screen operations to the prompts. Note: 【P-Width】 use ◀ key or ▶ key to set We must ensure that more than 200ms.

Low jump Test
1.jumpType: Open-LJ
2.P-Width : 200 ms
3.V-Step : 3 V
4.0ff-v : 037 v
(OK) Ad just pulse width according to open and close time of the switch Off voltage is selected, press the \leftarrow , \rightarrow button coarse voltage, press \uparrow , \downarrow keys to fine-coarse voltage.

6.2.8 [M-SW]

In a setting voltage, the switching of the switching experiment was repeated several times. Such as:

- (1) In 30% of the rated voltage, continuous operation of the switch three times, the switch should not operate reliably, which uses this function to complete.
- (2) Before the test switch factory to make the switch at the rated voltage, the need for repeated switching of the switch, and then test, also used this feature.
- ③ Internal voltage calibration: with a multi meter quantity "inter trigger" three core aviation plug, control the

power output of the close gate terminal or open gate terminal. Press or boot to output the test comparison..

6.2.9 Life Test

Instrument settings close open gate test interval and the number of tests can be run on the switch test. Also can be used as instruments aging test before shipment.

6.3 Main menu [View]

After the instrument has completed the test, view, analyze, print test results.

6.3.1 [Curve]

Integrated line pattern of test results, including the fracture time waveform of the waveform bounce time - stroke curve, the coil current waveform, these wave-forms are time as abscissa on a graph show the comprehensive map.

6.3.2 [All Data]

Displayed in tabular form the results of the measured values, including the inherent division of the fracture time value with the same period, and white the same period, just opened minutes just closed speed, maximum speed, the coil current, switching total, over travel, overshoot, bouncing amplitude and other parameters.

6.3.3 **[**Bounce**]**

Showing the fracture bounce time, bounce times. If you want to see every bounce fracture process in more detail. In the "detail" under the cursor, press [OK] key, A first fracture can see the corresponding c o moments of time the first and second co time, a second of time Bounce more detailed process.

Frac	Stau	Bounce Co	ut Pr	ocess
A1:	С	1.1mw	1	More
B1:	С	1.4mw	2	
C1:	С	7.4mw	4	



If you want to print bouncing results, "details" under the cursor, press 🛋 🕨 key left, "detail", then call up the [View] menu, select [print] to print results.

A1:BounceTime:	1.1ms Bo	unceCount:1
13.6H	13.7F	14.7H

Press[\uparrow][\downarrow] key to change next!

6.3.4 Analysis

Of the measured "time - Stroke" curve can be represented by the associated data analysis, of course, the main data analysis is obtained just open and just close data. (As shown below).



Operation Tip:

Enter the "velocity analysis" screen, in the "time - trip" curve on solid, dashed two coordinate vertical, dashed lines in the A channel just now just close point, the solid line is just the definition of just closing speed point, the screen coordinates of the upper left corner for the two lines intersect with the stroke curve coordinate values . The abscissa is time and the vertical coordinate of the moving contacts in the switching time point of the stroke position carved solid line can move around, move the coordinate point will change in real time, the dotted line does not move.

Press 🛕 or 🔻 key ,The solid and dotted lines can be switched.

"S = XX.X mm" for the trip two coordinate points on the curve ordinate the difference;

"T = XX.X ms" for the trip two coordinate points on the curve abscissa difference;

"V = XX.XX m / s" end points difference and the ordinate the ratio of the difference of the abscissa, ie moving contacts at this average speed between two points. If we just press the switch manufacturers combined speed of just define the settings for this two o'clock, then V shall be measured in just open just closing speed.

Of course, Keys to move the two coordinate lines to the appropriate location, View ordinate two coordinate points difference, you can see the open distance, over travel, overshoot stroke, bounce amplitude and other data. Can also be seen on the curve starting movement of the moving contact point in time series, "Print All" is not displayed in the data for analysis.

6.3.5 Test Info

Look back at the end of the test when the choice of the parameters of the test set.

6.3.6 [Print All] [Print]

[Print All] Print all test parameters.[Print] Print the contents of the currently displayed screen.

6.4 Main menu [File]

After the instrument has completed the test, the test results are saved and subsequent access to.

6.4.1 [File Open]

Recall Instrument has been saved test results.

6.4.2 Save File

The measured results are saved to the instrument memory at line number as a folder, the same number the test results can be stored in the same folder, in order to distinguish between different times. The result they do not delete them, can be permanently stored.

6.4.3 [Del File]

[Del File] You must specify the appropriate directory folder, select the appropriate files into the post only to delete the data.

6.4.4 D-Folder

Dlete folder: You must specify the appropriate directory folder, press [OK] key to delete the directory and the directory of all the data.

6.4.5 [U_Save]

Save data to U disk. Generally use the 4G brand U disk operation.

6.5 Main menu 【About】

Ownership of IPR instruments, software version number, the instrument's factory serial number, Website, email, address, telephone and other sales related information.

7. The matching equipment and service

Dynamic characteristic testing instrument circuit breaker Host	1	Set
Rotation Sensor	1	Set
50mm Linear Sensor	1	Set
Aluminum alloy wire box	1	Set
Internal trigger open close gate control line	1	Set
external trigger control line	1	Set
Fracture line	12	Set
Ground Line	1	Set
Short wires (length + short)	4	Set
Power Cord	1	Set
Paper	2	Roll
Certificate	1	сору
Factory inspection report	1	Сору
User Manual	1	Сору

8. Field wiring and the matters needing attention

8.1 safety preparations

First of all to ensure that subjects switch in the pre state overhaul, both ends of the knife switch connected ground, the switch is closed, cutting off the power operation of high voltage circuit breaker, avoid and instrument internal DC "collision", a simple approach is to take control of insurance.

8.2Field wiring

1 Instrument grounding must be reliable metal columns connected with the ground;

2 With the test line will be moving contact short circuit of three phase circuit breaker, and then is connected with the instrument metal grounding column is reliable, then the switch fracture line connected. For the inductive electric strong 220 KV, 500 KV high voltage circuit breaker wiring to bring the best insulating gloves. The fracture line wiring diagram in Figure below.



3 Install sensor.

4 Additional information

① Operation power is DC or AC. If the DC can use the internal power of the instrument, if not DC must use power instrument besides the external synchronization signal trigger (External trigger) test.

2 Operation power is DC220V or DC110V must be set before the test, adjustment.

⁽³⁾ Closing and opening control line connection method. For hydraulic or spring mechanism, the closing coil current is less than 20A, the instrument internal DC power supply can directly drive. Switching control can directly engage brake coil, but the best assistant node level string into the coil former. For the electromagnetic coil current is greater than 20A, the instrument internal DC power supply cannot be directly driven, must the front stage contactor coil instrument closing control received the closing coil's test.

(4) For the field switch locking time, may meet cannot move the test operating instruments within the power switch, you must unlock can test. Or by external trigger test.

(5) The two ends of the knife switch is opened, the next step will be to test.

8.3 The test finished clearing

Operating instrument for mechanical properties test on switch. The test finished off the instrument power supply, switch on the two ends of the knife. Remove instrument switching control line, fracture line and the speed sensor and its signal line, and then can remove switch moving contact short wires, final demolition wire. Then there storation of the site, the end of the test work.

9. Common technical problems and approaches.

9.1 A scene with the instrument control, open close gate operation, the switch does not operate.

9.1.1 Live open close gate control wiring is incorrect or control loop problems.

Approach: Find the site control cabinet control wiring diagram, ask the relevant conservation professionals find out open close coil and switch auxiliary contacts, see Appendix II of this manual control wiring diagram and instructions re-wiring. Check the control circuit, to ensure smooth flow loop.

9.1.2 the instrument prompts "output short circuit or load is too large,

please turn off check the control wiring."

- System wiring errors, cause the instrument to output short circuit, resulting in short-circuit protection function is activated, the instrument "close open gate control power" no output. Approach: the first after shutdown see above re-check the wiring.
- (2) Field coil load is too large, the instrument cannot properly drive.

Approach: For the electromagnetic mechanism of the switch, the switch closing coil as required drive current is large (up to 100A or hundreds of security), while the maximum operating power equipment with a carrying capacity of 20A. Resulting load is too large, the instrument cannot be properly driven.

The closing scene are generally connected to the control line in the closing stage before closing coil contactor coil, and with the instrument control switch contact is closed, with the closing coil contactor driver switches to make switching action. Or the use of "external trigger" operated switch closing.

9.1.3 check whether the instrument operating power supply with DC

output

Provided internally with a multi-meter instrument operating power supply voltage calibration check. (See section 5.2.8 of this manual ③ items). Such as voltage output is normal, perform other tests; such as no voltage output, then:

- Instruments Thermal Protection
 Approach: Shutdown, and then wait 5 minutes before turning test.
- (2) Instrument's internal power supply is damaged Approach: using live switchgear operating power, the use of "external trigger" operation. (Refer to the manual 6.2. 2) description of operation). The same time notify The Company Depot Repair or provide an alternate dryers.

9.1.4 the switching mechanism exists to protect locking (such as Siemens,

ABB switch)

Approach: (1) use of instruments available within the power operation switch, close open gate test must be lifted atresia, please scene technician or switch manufacturers officer under the control of site control cabinet wiring diagrams to help lift lockout.

(2) with site operation power supply, with "external trigger" tests.

9.2 the instrument to do a single open, a single close test, the switching

action, but no data show.

9.2.1 the ground is not completely connected

Approach: carefully check the ground, re-tighten the ground.

9.2.2 Closing no data, then closing the control loop is damaged, open

no data, then the open control circuit damage.

Approach: on-site with a good way power control channel that temporary test. Such as closing no data, then use the open gate channel test switch, Method is to open gate control lines (green, black line) connected to the closing coil, and with the open gate control to operate the switch closing the testing process. After field testing returned for repair or notify the Company provide backup machine.

9.3 the instrument together to do a single test, the switch is closed, they immediately separated.

9.3.1 the switch control circuit in question

Approach: carefully check the switch control circuit troubleshooting.

9.3.2 open gate control channel damage

Approach: Remove the open gate control line, just switch on the control channel with a test (see the second, three treatment approaches), the test is completed Depot Repair.

9.4 the printer can take the paper but cannot print text, graphics

9.4.1 printing paper installed upside down

Approach: re-installed correctly thermal paper.

9.4.2 thermal printer thermal head is broken

Approach: Depot Repair thermal printer thermal head.

10. Technical Q & A

10.1 the instrument site grounded, why the first ground line, and then followed by the fracture line?

A: The field test, since the high voltage switch (especially 220Kv above) between the ground and tend to fr acture a high induced voltage, this voltage value is large, energy is small, but enough to threaten the safet y of the instrument itself. Inside the instrument, the fracture signals are input to the indirect discharge circ uit. First ground wire connected to the discharge circuit real priority, then connect the signal line fracture, ev en when a high voltage is induced fracture, but also through the bleeder circuit vent into the earth, thus ensuring the safety of the instrument channel fracture.

10.2 how to determine whether the normal instrument port?

A: Select the [Test] - [C-Test] switch on the instrument at the bottom of the LCD screen with 12 real-time status display fracture. Screen display as shown below:

r Tes	st —									
0	oltag	e	: 2	220	V					
1.1	Trigger : InterTrigger									
Z I)urati	on	: 2	250r	ns					
3、5	Sensor	Inst	t: 1	A						
4、SensorType: Rotation										
5、StrokeTest: Close										
6、StrokeSet : 50.0mm										
7、SpeedSet : IEC 10ms										
8、 LineMunber: L0000000										
A1	B1 C1	A2	BZ	CZ	AЗ	B3	C3	A4	B4	C4
0	0 0	0	0	0	0	0	0	0	0	0

In this interface can detect instrument fracture channel is not intact, the fracture input if it is vacant, should show "O", if shorted to ground, it should display "C." So were the various fracture short to ground it, observing changes in the status display, the passage of time to determine whether the normal instrument fracture.

10.3 what is just open (close) speed? What is the difference

between with time and distance section defines the switch

just open (close) Speed

- A: The so-called just open (close) speed is a high speed switch just open (just close) period of time (or a distance) the average speed. If time is defined in the standard, IEC standards and our national standard is generally defined as before close after open 10ms the average speed. For some countries or some switch manufacturers define the different instruments can my company through data analysis functions redefined. Both can be defined as the time period, it can be defined as the distance segment, the flexibility to easily provide high-voltage switching speed test. For example a vacuum switch, 10KV switch ON distance is generally S = 11mm or so, It's just close (open) speed is defined as t just close (just open) 6mm average speed. Some manufacturers also defined as the following:
 - (1) Take full average closing, opening just minutes after taking the average speed of 6mm;
 - (2)Closing to take full average, average speed throughout the open to take;

With data analysis, but also easy, depending on the vacuum switch speed test. In addition, the vacuum switch speed test, due to the open gate process buffering mechanism works, the whole open gate process, and the average speed is very low. General definitions of the vacuum switch buffer mechanism during open gate function before the average speed, the average speed of the entire process, i.e. taking full average closing, opening just minutes after taking the average speed of 6mm is closer to the true value. 35KV vacuum switch to open away from the generally S = 22mm or so, so all of the above for the definition of 10KV vacuum switching speed value 6 to 10 or 11 can be.

11. The instrument submission

- 11.1 There are two rows of fracture 1, socket panel, A1B1C1 and A2B2C connected to ground together (The upper end of the metal grounding columns). A3B3C3 and A4B4C4 connected to ground together, Virtual ground
 If the time, over the same period, jumping and other parameters to simultaneously test 12 fracture, must be ground pole and virtual connected, then the detection device of black earth column.
- 11.2 Time synchronization bounce time test and related parameters, Instrument [Test Set] menu must choose a different test time, must ensure the output test time is not less than the standard time generator pulse duration.
- 11.3 calibration, instrument calibration device to prevent false triggering, must cancel short-circuit protection function. Enter [About] menu, see the copyright information. Press key and key, release the button when prompted, then press [ok] key. Reset or shutdown, short-circuit detection function of automatic recovery.
- 11.4 If you want to test the speed of the definition of speed, select the corresponding speed definition. If the average speed, then speed is defined "the same as the average speed". Straight stroke sensor standard for the 50mm linear sensor, please do not go beyond its pull stroke, so as to avoid damage to the sensor.
- 11.5 the instrument settings menu [Para Opt] some omitted parameters, if necessary,please select the instrument,test results will be displayed,or to omit.