

HZC-4080

High-voltage Switch Characteristic Tester



Huazheng Electric Manufacturing (Baoding) Co., Ltd

Dear user:

Thank you for choosing HZC-4080 High-voltage Switch Characteristic Tester.

We hope that this instrument can make your work easier and more enjoyable, so that you can get the feeling of office automation in the test and analysis work.

Before using the instrument, please read this manual, and operate and maintain the instrument according to the manual to prolong its service life. "Just a light press, the test will be completed automatically" is the operating characteristics of this instrument.

If you are satisfied with this instrument, please tell your colleagues; if you are not satisfied with this instrument, please call (0312) 6775656 to tell you to serve you at all times-Baoding Huazheng Electric Manufacturing Co., Ltd., our company will definitely make you satisfied !

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I. Technical Parameters

1.1 service environment

Enter the power supply 220V $\pm$ 10% 50Hz $\pm$ 10%

Atmospheric pressure 86~106kpa

Temperature -10~40℃

Humidity $\leq$ 80%RH

1.2 Safety performance

Insulation Resistance $>$ 2M Ω

Dielectric Strength 1.5KV power supply chassis work frequency withstand voltage 1 minute, no flashover and arcing.

1.3 The Basic Parameters

a. Time: range: 20000.0ms resolution: 0.1ms

word error: ① 200ms 0.1ms $\pm$ 2 word

② 2000ms 0.1% $\pm$ 2 word

③ 20000ms 0.1% $\pm$ 2 word

b. Velocity: range 20.00m/s resolution 0.01m/s

word error: ① within the limits of 0-2m/s $\pm$ 0.1m/s $\pm$ 1 word

② more than 2m/s $\pm$ 0.2m/s $\pm$ 1 word

c. Tips:

	span	resolution	error
Vacuum breaker	50.0mm	0.1mm	1%±1 word
SF6 circuit breaker	300.0mm	1mm	
Less oil circuit breakers	600.0mm		

d. Current: 10.00A resolution range 0.01A

e. Output power: DC0 ~ 300V digital adjustable / 20A

(instantaneous working), resolution 1V.

f. Dimensions: 360mm (L) $\times$ 280mm (W) $\times$ 300mm (H)

g. Weight: 9kg

II. Performance Characteristics

1. Function

a.time : The inherent points and closing time of the 12 breaks are the same period and phase.

b.reclosing : Each break combined-point, split-close, split-close-split process time: one time, one time, two time, gold short time, no current time value.

c.bounce : Jump time, bounce times, bounce process, bounce waveform; the rebound amplitude of each break.

d.velocity: Just score, rigid speed, maximum speed, time-stroke characteristic curve.

e.route or distance of travel : Total trip, open distance, over trip, over stroke, rebound amplitude.

f.current: Division and closing current value and current waveform diagram of the split and closing coil.

d.operation voltage : DC0~270V / 20A digital adjustable circuit breaker action power supply is provided in the machine to automatically complete the low voltage action test of the circuit breaker and measure the action voltage value of the circuit breaker.

2. Characteristics

a. All models suitable for domestic and foreign production of SF6 switchgear, GIS combination of electrical, vacuum switch, oil switch mechanical properties test

b. Super anti-jamming capability, 500KV substation the bypass bus charged case can easily test to accurately measure.

c. Universal speed sensor, straight line linear sensor, rotary sensor, extremely easy to install and simple.

d. Switching operation once obtained the switch mechanical properties testing of all data and the corresponding waveform Spectrum.

e. The host field test data, the machine can be stored in the real-time clock, easy to the archive save the test date, time.

f. Host big screen, wide temperature, direct perspective, backlight LCD Chinese display all data and maps, LCD contrast electronic adjustment, power and memory.

g. Chinese menu operation, easy to use. Instrument built-in printer, fast print all data and maps at any time.

h. The instrument with data analysis and management software, with PC online operation, the test results can be output to the various types of dot matrix, laser or ink-jet printer to print the test report, the field trials computerized.

III.Terminology Definition

a. Points (a) Opening time: Tripping coil of the points (a) power as the starting time to move, the static contact just points (a) time.

b. The same period: the same phase being, points (a) the maximum and minimum opening time the difference.

c. White year: Three-phase points (a) and the maximum and minimum opening time difference between.

d. Average speed: points (a) gate process, moving contacts total travel before, after removing 10% each, to take the middle 80%, the ratio of the moving contact sport trip time.

e. Maximum Speed : Gateway process in the points (a), the moving contact sport, take the moving contact sport every 10ms for a speedometer unit until the moving contact sport stop certain speed unit value, of which the largest unit The speed value shall be the points (a) the maximum speed of the gate.

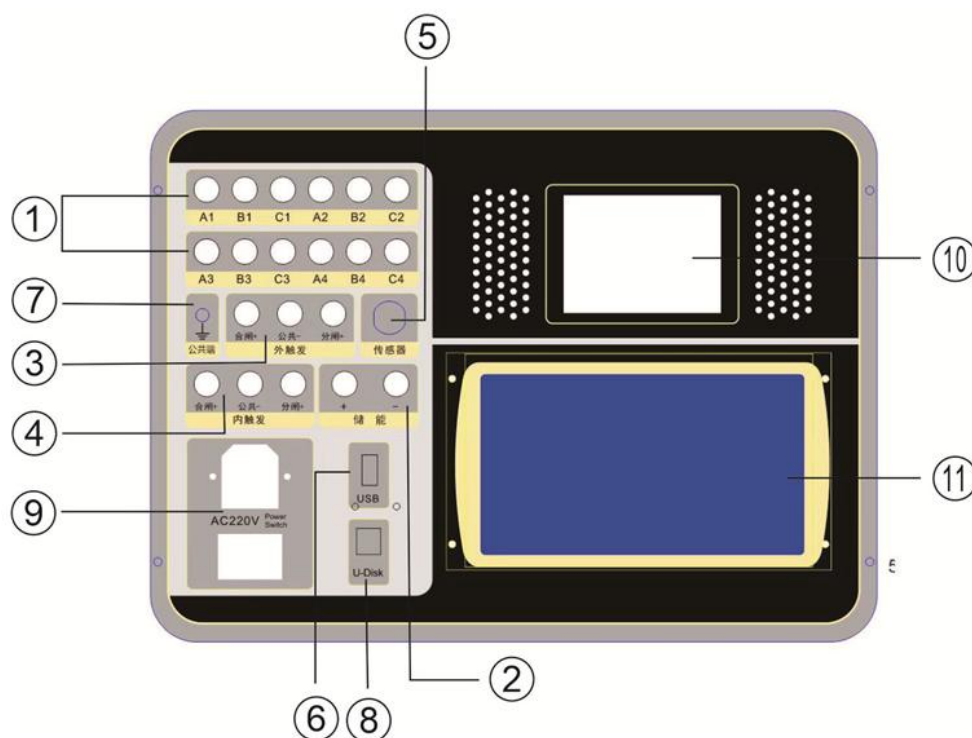
f. Just points (a) speed: different switch models depending on the measured switch factory, each manufacturer to define the different just now, just closing speed, the tester included various definitions section for The user's own choice.

ABB-HPL550B2:	ABB's 550KV SF6 switch;
And 10ms after the anterior separation:	Some oil switches and some SF6 switches;
5ms each before and after partition:	Part of the oil switch;
LW 6 type :	The LW 6 type SF6 switch;
The LW 8-35 type:	The LW 8-35 type SF6 switch;
10% To break the mouth:	Part of the SF6 switch produced by Xi'an switch factory;
Same average speed:	Part of the SF6 switch produced by Shenyang switch factory;

LW33—126	The LW 33-126 type SF6 switch;
And 10mm after the anterior separation:	Part of the 35KV vacuum switch;

If all the above definitions are not adopted, the user can define the velocity sampling section of the rigid and rigid speed on the curve according to the time travel characteristic curve measured by the tester (the travel is directional), and the instrument automatically calculates the rigid and rigid speed defined by the user (the travel and time ratio in the sampling section).

IV.The Layout Of Panel

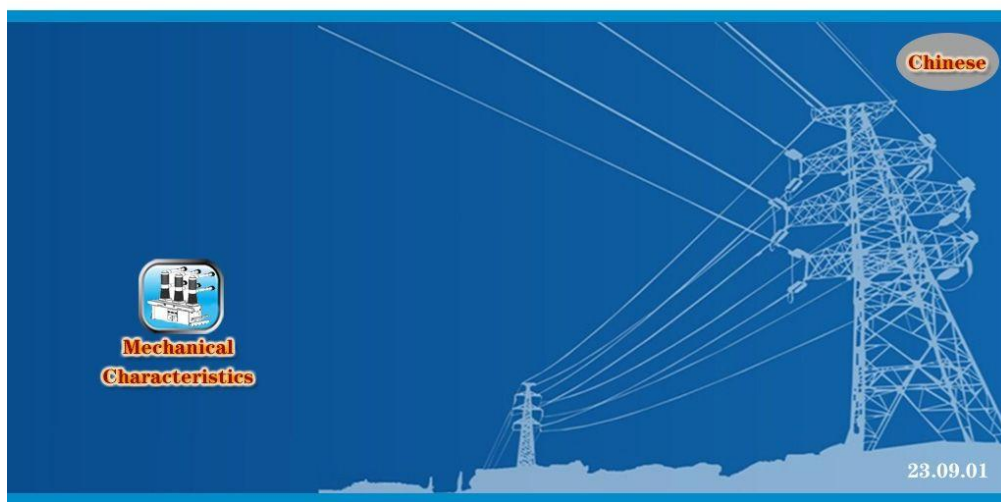


Number	Panel Signs	Function Description
①	A ₁ B ₁ C ₁ A ₂ B ₂ C ₂ A ₃ B ₃ C ₃ A ₄ B ₄ C ₄	The 12-way break time measurement channel
②	Energy storage socket	Provide the DC energy storage motor power supply,
③	External trigger socket	In the external trigger mode, directly connect both ends of the coil, and take the electrical signal on the coil as the synchronous signal.
④	Internal trigger socket	Lock control, provide switch control DC power supply
⑤	Speed-sensor socket	Signal input to the speed sensor

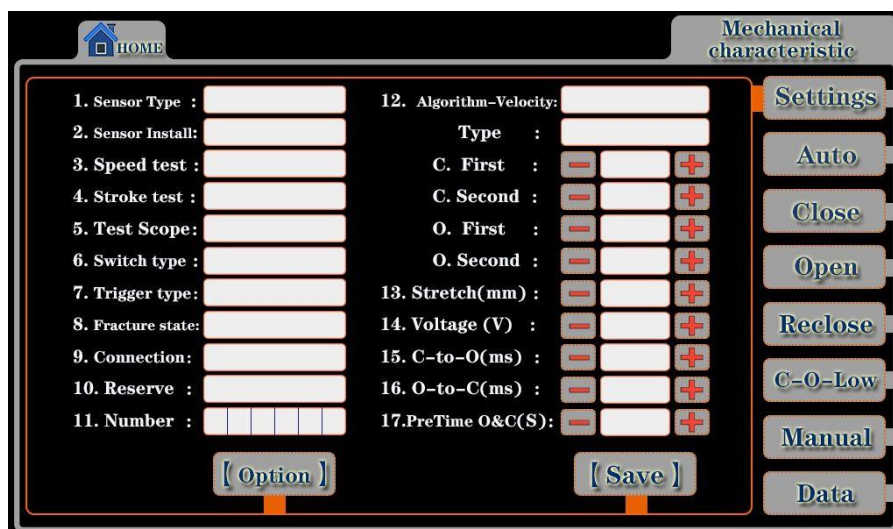
⑥	USB joggle	You can connect to the computer through this port.
⑦	Protect the ground end	Meet the earth
⑧	U-Disk	With this function, the U disk operation can be performed.
⑨	power switch	Input power supply 220V $\pm$ 10% 50Hz $\pm$ 10%
⑩	Panel printer	Print the test report and the map
⑪	liquid crystal display (LCD)	Large screen, wide temperature, background light liquid crystal, all Chinese display all data and map

V.Instruction Of Menu Operation

Turn on the power supply, and the instrument enters the opening interface:



Click "Switch Features" on the screen to go to the Settings main menu.



Before the test, the setting of the various operation states of the instrument.

5.1 Set Test

①Sensor type: linear resistance, rotating resistance, acceleration sensor and photoelectric sensor.

Make the corresponding setting according to the sensor used. If there is no sensor selection, no.

②Sensor installation: according to the sensor installation location, select different. Install a sensor three-phase linkage mechanism and select three-phase linkage; install three sensors and select three identical tests.

③Speed test: if the field is not a speed test, this shutdown can shorten the test time and reduce the test strength.

④Travel test: When testing with a linear sensor and a photoelectric sensor, this item can be opened to test the trip. This setting is turned off when using another sensor or when you do not want to test the trip.

⑤Test duration: refers to the length of the internal power supply output operating voltage.

200ms: general conventional switch single point, single combination test, choose 250ms time.

2000ms: When the switch is reclosing. Close-points, divide-close, divide-close-points.

20000ms: general contact switch, switch before the advance action, switch needs a long time.

⑥Test type: A, metal contact: conventional metal contact switch.

B. Closing resistance: (without this function)

C., Graphite contact: (without this function)

⑦Trigger mode:

Internal power supply trigger: use the internal DC power supply of the instrument to divide and switch on the operation;

External power supply external trigger: the internal DC power supply of the instrument does not work, using the field power supply (AC DC) switch operation. When

the instrument is closed (sub) gate, the "external trigger" wiring of the instrument is directly connected to the closed (sub) gate coil. When the switch moves, the instrument takes the voltage signal from the coil as the starting point of timing.

Auxiliary contact trigger: without the coil power signal, the test can be triggered by auxiliary contact mode.

Sensor trigger: manual switch, no electric control mechanism, there is no timing starting point. The sensor action can be used as the starting point of timing for measurement.

Manual switch: the measurement of the manual switch. Only need to connect the break line, and then do close, switch test. The instrument is in a waiting state. Manual split and close the switch can be again.

⑧Status detection: check whether the sensor is working and the installation is reasonable. And whether the switch splits status is correct. Ensure that the wiring is correct. Delete a user's own definition of speed.

⑨Common speed definition: the instrument has solidified several conventional speed definitions (note: this definition can be redefined and solidified on the instrument by PC as needed), and select the corresponding definition according to the switch model. If the corresponding definition cannot be found, the "time-stroke characteristic curve" is generally taken to measure and then the corresponding analysis on the curve to obtain the corresponding speed value.

Tender Settings: Enter the total travel value of the switch when measuring the speed with the rotating and acceleration sensors. When testing with the linear sensor and the photoelectric sensor, input the annotated travel value of the sensor.

output voltage : The output voltage value of closing, closing and reclosing is set according to the switch needs.

⑩Closing-closing interval: time interval during closing-closing interval

⑪Sub-closing interval: time interval during sub-closing

⑫Pre-split time: there is a switch that needs pre-energy storage, set this item. There is no general choice.

Tip: When all options are complete, click "Save" to complete all settings.

5.2 Option

HOME

Mechanical characteristic

1. Contact gap:		12. Closing bounce:	
2. Over travel:		13. Opening bounce :	
3. Rotation angle:		14. C. distance overtravel:	
4. Trigger Type:		15. O. distance overtravel:	
5. Magnify draw:		16. C.Rebound overshoot :	
6. Fracture time:		17. C.Rebound overshoot :	
7. Interruption:		18. C.&O.-V. :	
8. Fracture display		19. Max/Average V. :	
9. Reserve :		20. Coil current :	
10. Protection :		21. Coil resistance:	
11. Feedback :		22. Reserve :	

[Tuning] [Save]

Settings
Auto
Close
Open
Reclose
C-O-Low
Manual
Data

According to their own needs, choose whether to be displayed data items."transferSchool parameters " generally factory are adjusted, do not need to set.

Tip: After all the Settings are completed, click the "Save" button to save the settings items.

If the next test does not change, the instrument will still be tested according to this setting.

5.3 test

After the instrument is set up, conduct the test.

【test】 include 【automatic testing】 【Switch test】 【Zapping test】

Single close and single split test of the switch. Automatic test is based on A1 fracture as the judgment standard, if A1 points, automatic closing test, if A1 is combined, do the closing test.

5.4 Reclosing

Make a reclosing test on the switch.

① 【Together-points】

The "close-split" test of the switch, the set "close-t1-split" control time interval test, directly get the one close time, one point time, gold short time value of the switch.

② 【Divide-close】

The "split-close" test of the switch, the setting "split-t2-close" control time interval test, directly get the one point time, one close time, no current time value of the switch.

③ 【Points-together-points】

The "split-in-split" test of the switch, the set "split-t2-close-t-1-split" control time interval test, directly get the one minute time, one close time, two split time, gold short time, no current time value of the switch.

Note: The control time interval t1 refers to the time from the closing coil to the switch coil, and the control time interval t2 refers to the time from the switch coil to the switch coil. For the operation of "close-t1-split", "split-t2-t2-close" and "split-t2-close-t1-t-split" operations, the control time interval t1 is set as the closing time, which is equivalent to the switch closing time, and the control time interval t 2 is set as the switching time, which is equivalent to the switch switching time.

5.5 Low voltage

Automatic low voltage action test, after entering the interface, according to the screen operation prompt of the instrument.

5.6 Manual control

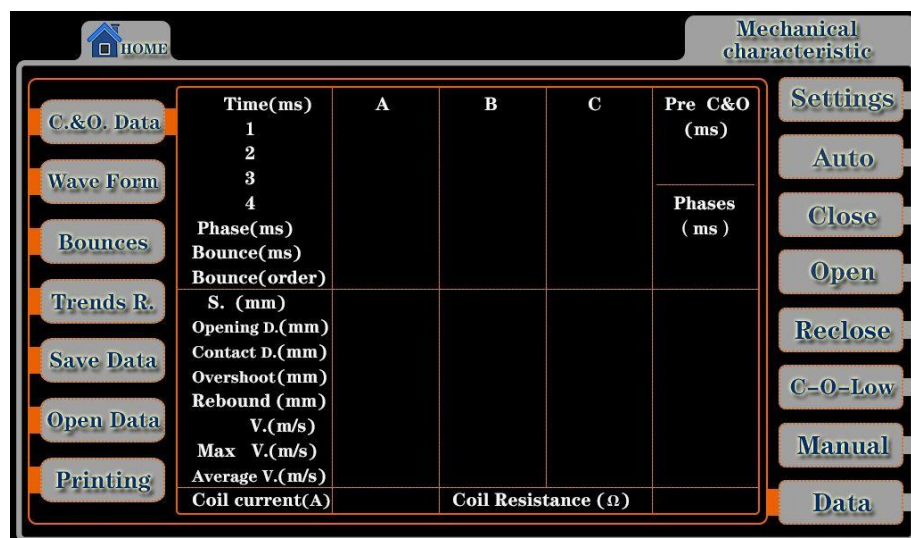
At multiple voltage voltage on the switch.in compliance with:

①At 30% rated voltage, operate the switch for three times, the switch should not act reliably, that is, with this function.

②Before the switch test in the switch plant makes the switch, at the rated voltage, the switch should be repeated, and then test, also use this function.

According to the prompt: adjust the voltage, press the left button, press the right button to switch, press the confirmation key energy storage output. Quit to return.

5.7 Data management



After the instrument completes the test, view, analyze and print the test results.

5.7.1 [Data all]

The results of the test show, press the upper and lower keys to switch the data table and the graphical display interface.

Comprehensive curve map, including the time waveform, bounce waveform, time-stroke curve, coil current waveform of each fracture, etc. These waveforms are all integrated map displayed in time on a coordinate map.

The measured result value is displayed in the form of a table, including the inherent separation time value of each fracture, the same period, interphase, rigid separation speed, maximum speed, coil current, total stroke, switch stroke, overstroke or rebound amplitude, etc.

5.7.2 【Jumping details】

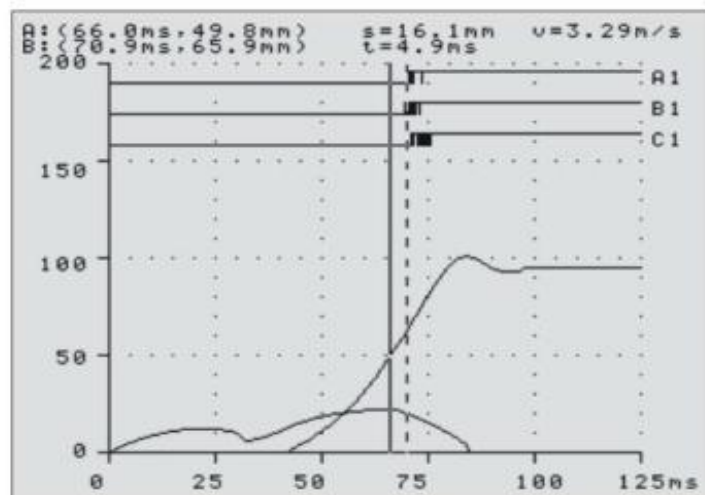
The time of jumping and the number of jumping times of each fracture are displayed. On the right, you can see the more detailed bounce process of each fracture, showing the first moment, the first minute, the second closing time and the second minute of the corresponding fracture. A more detailed jumping process. Press up and down, switch to select each fracture. If you want to print the bouncing results, press the return key, then move the cursor to [file] menu [print interface], OK.

5.7.3 【Dynamic resistance 】

There are closed resistance, graphite contact and other transition fracture waveform, can view its resistance waveform, generally without.

5.7.4 【Comprehensive waveform】

The analysis of the measured "time-stroke" curve can obtain the relevant data, of course, the most important is to obtain the rigid separation velocity data.(as illustrated in following figure)



Action tips:

Entering the "Speed Analysis" interface, there are two vertical lines and dotted lines on the "time-stroke" curve. The dotted line is on the rigid junction point of channel A. The solid line is the definition point of the rigid junction speed, and the upper left corner of the screen is the coordinate value of the intersection of the two coordinate lines and the stroke curve. The abscissa is the time, and the ordinate is the travel position point of the switch moving contact at the moment. The solid line can be moved left and right, and the coordinate point will change in real time when moving, and the dotted line cannot be moved.

Press  or  key to switch the solid and dashed lines.

"S=XX.Xmm" is the difference between the ordinate of the two coordinate points on the travel curve.

"t=XX.Xms" is the difference between the abscissa of the two coordinate points on the travel curve.

"V=XX.XXm/s" is the ratio of the ordinate difference to the coordinate difference, which is the average speed of the moving contact between the two points. If we set these two points according to the definition of the rigid separation speed of the switch manufacturer. Then V is the measured rigid velocity.

Of course, move the two coordinate lines to the corresponding position, check the difference between the longitudinal coordinates of the two coordinate points, you can see the opening distance, overstroke, overshoot process, rebound amplitude and other data. On the

curve, a series of "comprehensive data tables" such as the starting movement point of the moving contact can not be shown for analysis.

5.7.5 【Open the data】

Call up the test results already stored in the instrument.

5.7.6 【save data 】

Save the test data as tested.

Save the file with the date as the file name, and the saved results can be saved permanently as long as they are not refreshed. This instrument can store thousands of sets of data. File names are automatically added after saving. If there is no data, it is displayed as empty.

5.7.7 【Print interface】

Print the current data interface displayed on the screen.

5.8.Date time

Set the time of the instrument, when the main menu, click the time display bar above the screen to enter the time setting menu, generally the factory is adjusted, do not need to set.

VI.Field Wiring

Special security hints: after the instrument comes to the scene, please first connect the instrument protection ground to the site of the site, and other wiring and operation can be carried out; after the test, the instrument power is turned off, then the other lines are removed, and the ground wire is dismantled.

6.1 Ground Line And Fracture Line

See Appendix three: "connection diagram of fracture"

6.2 Dividing Line Control Line

(1) when the switch control power supply is provided inside the instrument, the control power in the control box is disconnected (usually the insurance that connects the control power supply with the control bus), but it can not cut off the energy storage power of the switch mechanism, and then the connection diagram of the appendix two "internal electric source control".

Note: the instrument can only provide DC current, and use the internal trigger of the instrument's internal power. If the field switch is an AC operation mechanism, please use the external trigger mode.

(2) when the external field power is used for dividing and closing control, the output of the control power is not connected.

When the switch is used for a single test, two lines are triggered externally and the ends of the brake coil are engaged.

When the switch is used for single point test, two lines are triggered externally and the two ends of the split coil are connected.

Tip: use external trigger when using external power. The external trigger mode can be tested regardless of whether the switch mechanism is AC or DC. When external triggering is used, the switching power is not connected.

VII.The Installation Of The Sensor

This instrument is equipped with three kinds of speed sensors, which are used in different situations. The three sensors are connected to the "speed sensor" socket of the instrument through a sensor signal line.

7.1General speed measuring sensor (optional)

Traditional speed sensor usually with a slide wire resistor or photoelectric sensor (sub-grating and photoelectric encoder two), these types by moving and stationary parts. Velocimetry, are respectively mounted on the movement of the switch member (movable contact or enhance the lever) and the stationary member (the cap seat or switch base) on, and with the better. In this way, for different switches need to produce many different mounting bracket, on-site installation and removal is very difficult.

My company after years of research, the acceleration technology applied to switch tachometer solve the switching field speed sensor installation difficult, with hard, testing the difficult technical problems, the universal sensor site is easy to install, simple and easy to operate.

Installation tips:

Universal sensor fastening installation even enhance pole switch or level Xuan on, or other transmission poles.

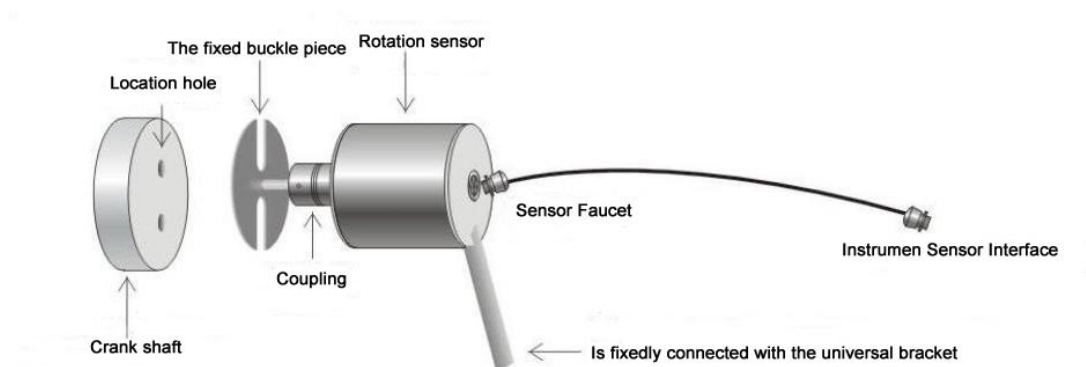
Installation Note 1: the universal sensor socket direction and the direction of movement of the moving Xuan, keep moving Xuan parallel, if you pretend skew may cause inaccurate measurement data.

Installation Note 2: Universal sensor installation should be based on the lever of different thickness optional, the corresponding radius of cards very firmly stuck in the moving rod, can not shake the sensor. Switching action, the sensor should bear bear lever movement together, can not be used in conjunction with the lever relative shaking, or can cause inaccurate test data.

Installation Note 3: the universal sensor installed in the switch automatically rod certain location space should be left around the sensor up and down when the switching action, does not cause the sensor to collide with the surrounding switch parts in the course of the campaign, causing damage.

7.2 Reel Sensor

Universal sensor suitable for sensors for linear motion of the gun, some switches, especially imports and joint venture switch, linear transmission parts are enclosed inside the switch body, versatile sensor can not find the installation site. Switch manufacturers factory do speed test, a test switch the division and indicator or rotating shaft, such choose the rotation sensor.



Installation note: rotation sensor axis should as far as possible and switch axis keep concentric, otherwise sensor rotating obstacles, measure curve of burr will be very heavy, impact test data is correct.

7.3 Linear travel speed sensor

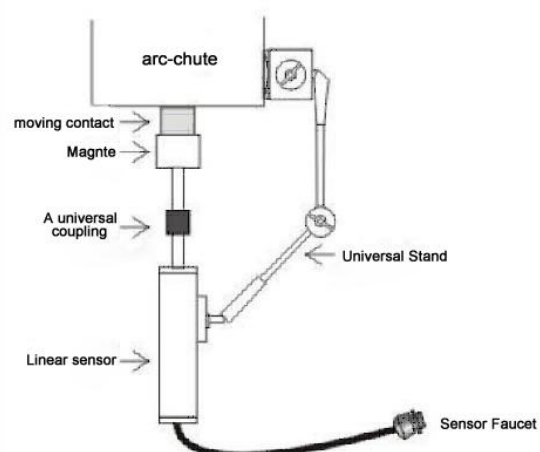
If you need very accurately measure, switch action stroke, need to use linear sensor.

Linear sensor has three specifications, respectively is 50 mm, 200 mm and 300 mm.

50 mm linear sensor used for vacuum switch stroke velocity measurement;

200 mm and 300 mm for SF6 switch stroke, speed measurement, the two kinds of sensors

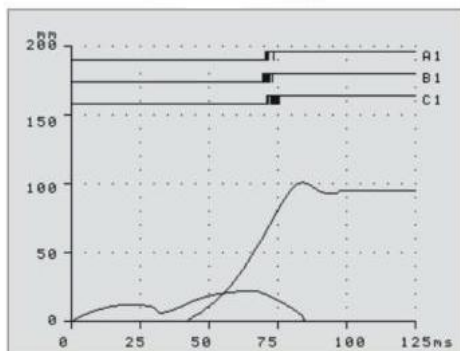
is a standard configuration.



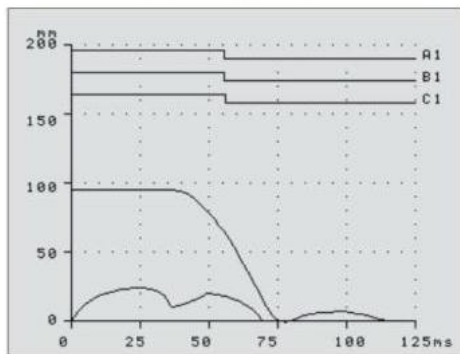
To a certain type of vacuum switch as an example, in the following figure. Linear resistance sensor in the installation, to ensure the sensor motion shaft to linear motion, with magnetic universal support fixed good sensor. For SF6 switch, oil switch, similar to the way.

Tip: The linear sensor, due to the cumbersome installation of the site, which is not the conventional accessories of this product. Users can, according to different switches, design the installation bracket, keep the movement of the pull rod of the sensor and the switch contact parallel and synchronous, and can accurately measure the movement stroke and corresponding speed of the switch.

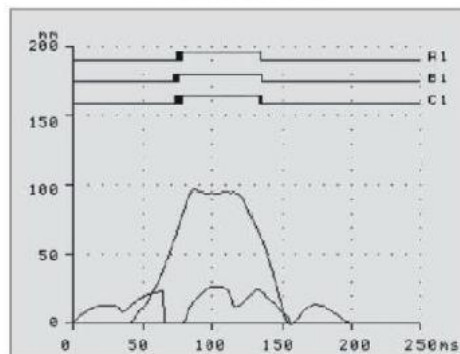
Appendix 1. Use Instrument Some Measured Graphics And Text Results



Close	Pole A	Pole B	Pole C	
1	69.9	70.9	71.0	
2				
3				Inter.
4				
Inter.	0.0	0.0	0.0	1.1ms
V.				
S.	106.2mm			
V.Max	4.15m/s	V.Ave.	3.75m/s	
I.coil	2.27 A	R.coil	100	



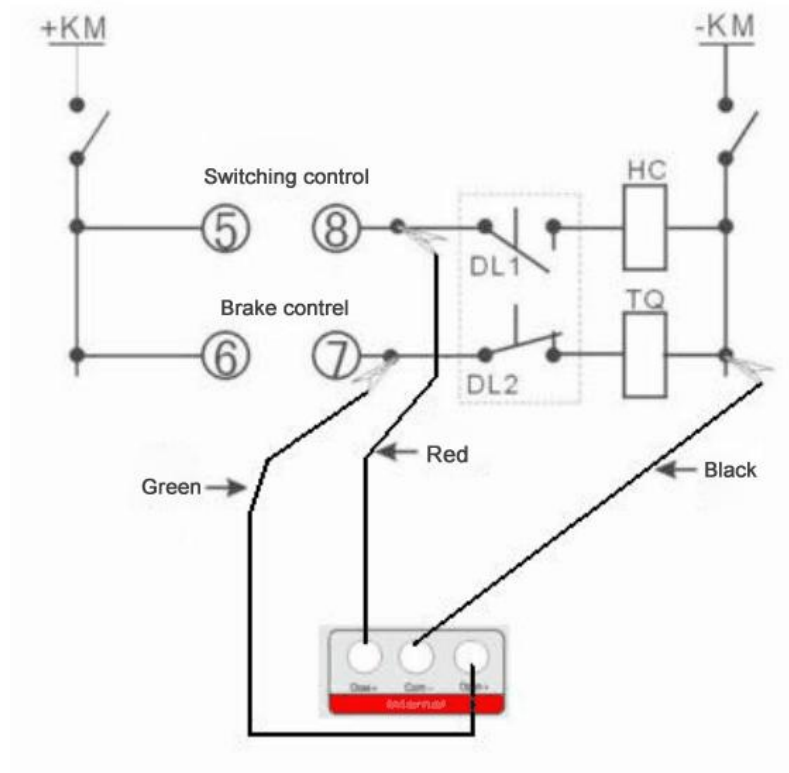
Open	Pole A	Pole B	Pole C	
1	55.6	55.8	56.4	
2				
3				Inter.
4				
Inter.	0.0	0.0	0.0	0.8ms
V.				
S.	106.5mm			
V.Max	5.23m/s	V.Ave.	4.74m/s	
I.coil	2.41 A	R.coil	98	



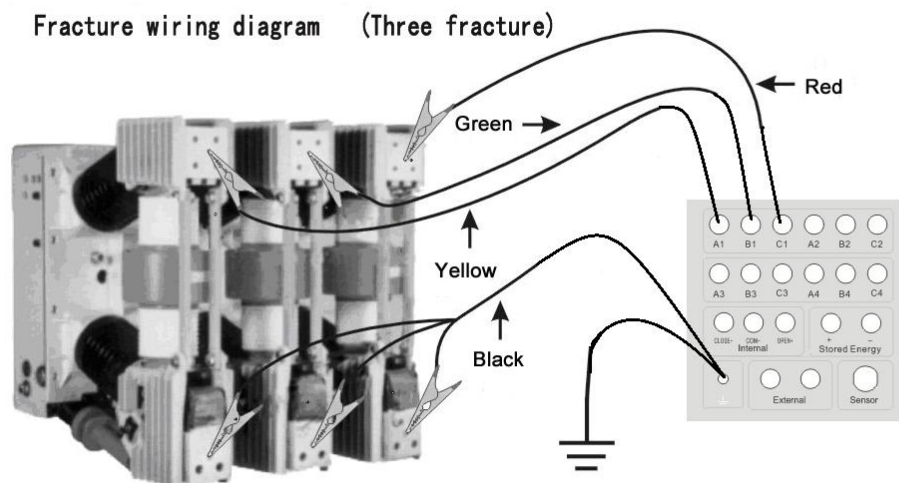
Redclose	O	C	Gold short	
A1:	74.2	54.4	60.3	
B1:	72.0	54.9	63.0	
C1:	73.9	55.6	61.8	
A2:				
B2:				
C2:				
A3:				
B3:				
C3:				
A4:				
B4:				
C4:				

Appendix 2. Internal Control Power Wiring Diagram

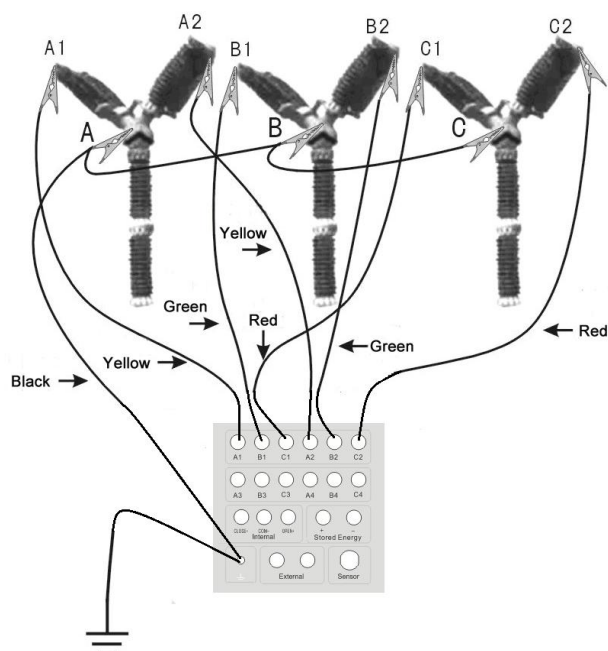
Note: must disconnect measured switch control box control power (usually will control the control power supply and control bus linked insurance dial the off), but can't cut off switch mechanism of stored energy power supply.



Appendix 3 Fracture Line Diagram



Fracture wiring diagram (Six fracture)



Appendix 4. Testing Field Common Technical Problems And Treatment Measures

A. Field use instrument control together, break-brake operations, switch not action

1. Field close, points brake control wiring is not correct or control circuit problems

Processing method: find the control cabinet control wiring diagram, ask relevant protection professionals, respectively to find close, points brake coil and switch auxiliary contact, see appendix 2 this manual control wiring diagram and instructions rewiring. Check control circuit, ensure smooth loop.

2. Instrument hint "output short circuit or load is too big, please shut down check control wiring"

(1) The control wiring error, cause instrument output short circuit, the short circuit protection function start, instrument "close, points brake control power" no output.

Processing method: shutdown after see the above first, 1 to test connection.

(2) The field coil load is too large, the instrument can't normal drive

Processing method: (1) for electromagnetic mechanism of switch, due to the switch closing coil requirements of the drive current very large (up to 100 a or hundreds of Ann),

and the instrument operation power the maximum loading capacity of 20 a. The load is too large, the instrument can't normal drive.

Site is usually the switching control line up in closing coil former level switching contactor coil, use instrument control switch contactor close, with the contactor drive switch closing coil, make the switch action. Or use "external trigger" mode of operation switch switching.

(2) For hydraulic and spring mechanism of the switch, due to the instrument to output current is greater than 6 when a default "load excessive". Please have a look at or using a multimeter to measured the closing coil resistance tolerance of the elements and confirm closing coil current is heavy. Then please carefully check the wiring, confirm closing output no short circuit, then cancel instrument short circuit protection function test. (note: instrument short circuit protection function was cancelled, "close, points brake control power" output will not have protection function, if the control power output is really short circuit state, it may cause instrument control power damage! Please careful operation)

The specific method is: shutdown - hold button and hold it down to boot, until you reach the "release button" screen prompt to loosen the key, short circuit protection function to cancel.

Note: instrument as long as to shutdown or reset, short circuit protection function and restart.

3. Inspection equipment operating power if there is a dc output

Using a multimeter to instrument internal provide operating power for voltage check check (see this manual article 5.1.1 the first 9 items). Such as voltage output normal, the other inspection; If no voltage output, then

(1) Operation line of insurance tube burned or line damage.

Processing method: replace new insurance tube or to meet good line.

(2) Instrument internal power damage

Processing method: use the switch cabinet operating supply, adopting the "external trigger" way operation. (see this manual 6.2. (2) introduced the operation) and notify the company return factory maintenance or provide spare machine.

4. Switching mechanism exist to protect atresia (such as Siemens, ABB switch)

Processing method: (1) the use of instruments to provide inner power operation switch

close, points brake test, to dissolve atresia, please on-site technical personnel or switch factory personnel according to the control cabinet control wiring diagram, help remove atresia.

(2) Use site operation power, with "external trigger" means test.

Second, the instrument do single joint, single points test, switch action, but countless according to display

1. Ground not completely meet good

Processing method: carefully check the ground, retighten ground.

2. Closing coil or points brake of coil resistance is too big, so that the load is too small (general coil current less than 1 a, is easy to appear this kind of circumstance), makes the instrument to trigger the, not the collected data.

Processing method: cancel the short circuit protection function to test. (see first, 2 (2) how to cancel the short-circuit protection function)

3. Closing out data, the switching control loop damage, points brake out data, then points brake control loop damage.

Processing method: field with the good all the way power control channel temporary test. Such as closing out data, then use points brake channel test closing, the method is, the points brake line (green, black line) joint in the closing coil, with points brake control to operate switch closing test process. The field test after completion of the return factory maintenance or notify the company provide the backup machine.

Three. instrument do single joint test, switch is closed, and separate immediately.

1. Switch control circuit has a problem

Processing method: carefully check the switch control circuit and remove the faults.

2. Switching control channel damage

Processing method: take the points brake line, use switching control channel do test (see the second, three processing way), when the experiment is complete return plant maintenance.

Four. printer can walk paper but can't print text, graphics

1. Printing paper installed backwards

Processing method: to properly installed thermal printing paper.

2. Thermal printer heating head is broken

Processing method: return factory maintenance thermal printer heating head.

Five. the instrument speed test, test results appear full screen vertical stripe

The sensor options wrong (such as general sensor with linear or rotary, linear or rotary with general options).

Processing method: the sensor choose to set up.

Technology Answer

1. Instrument field ground, why must first ground line, and then pick fracture line?

Answer: the field test, due to high voltage switch (especially 220 kv above) to the fracture between often have high induction voltage, the voltage value is very big, energy is lesser, but enough to threaten the safety of the instrument itself. Internally, fracture signal input to the indirect have bleeder circuit. First ground line, the actual priority on the discharge circuit, the connection fracture signal line, even fracture induced a high voltage, also can through the discharge circuit drain on the earth, so as to ensure the safety of the instrument fracture channel.

2. How to judge the instrument port is normal or not?

Answer: choose the test **】** - the closing test **】** , instrument of liquid crystal display the bottom there are 12 fracture real-time status display. Screen are shown in the following graph:

In this interface can detection instrument fracture channel is in good condition, fracture input if it is impending, should display "points", if on short circuit, it should display "close". So the respectively each fracture on short answer it, to observe the change of state display, to determine the instrument fracture time channel is normal or not.

Current : ✓	Travel : ✓
Velocity: ✓	Voltage : 219
Senor Pos : Pole A Time Scope: 250ms Prep. Time: 0ms Tigger : Internal Senor Type: Linear Resister Velocity : Genaral 10ms Travel : 50.0 mm	
A1 B1 C1 A2 B2 C2 A3 B3 C3 A4 B4 C4	
0 0 0 0 0 0 0 0 0 0 0 0	

3. What is just points (\$) speed? With time and distance section definition switch just points (\$) speed have why to distinguish?

Answer: the so-called just points (\$) speed is refers to the high voltage switch just minutes (just before points) for a period of time (or a distance) average speed. If the time is defined standards, IEC standards and China's national standards generally defined as \$10 minutes before the average speed of ms. For some countries or some switch manufacturers definition is different, my company instrument can through the computer and matching speed definition add degree redefined. Both can be defined as time, also may be defined as distance section, but is flexible and convenient for high voltage switch provides speed test. In vacuum switch for example, 10 kv switch open distance is commonly $S = 11$ mm or so, its just \$(points) speed is defined as just before the close (just minutes) 6 mm average speed. Also some manufacturer defined as the following kinds:

- (1) Switching take the average, points brake take just points 6 mm average speed;
- (2) Switching take the average, points brake take the average speed;

Given the speed definition add program function, also can convenient according to specific vacuum switch on speed test. In addition, the influence of vacuum switch on speed test, because points brake process buffering mechanism of action, the whole points brake process average speed is very low. General definition vacuum switch points brake process buffering mechanism of action before the average speed for the whole process of the average velocity, namely switching take the average, points brake take just points 6 mm average speed is relatively close to the true value. Because of 35 kv vacuum switch

open distance is commonly $S = 22 \text{ mm}$ or so, so all for the 10 kv vacuum switch speed in the definition numerical 6 to 10 or 11 can.

VIII. Packing List

No.	Item	Qty
1	Main engine	1
2	Three core test line	1
3	Two core test line	1
4	Four core test line	1
5	Test line (3 black 1 red 1green 1 yellow)	6
6	The universal bracket	1
7	Rotating sensor	1
8	Line sensor	1
9	Sensor wiring	1
10	Double test line	2
11	Power line	1
12	Ground lead	1
13	Alligator clips (4 black 2 red 2green 2 yellow)	10
14	Fuse pipe	4
15	Print paper	2
16	Small clip(3 black 1green 1red)	5
17	Needle joint(1 black 1green 1red)	3
18	Allen wrench	1