Dear Client,

Thank you for purchasing our JFD-2000A Partial Discharge Detector System. Please read the manual in detail prior to first use, which will help you use the equipment skillfully.



Our aim is to improve and perfect the company's products continually, so there may be slight differences between your purchase equipment and its instruction

manual. You can find the changes in the appendix.

Sorry for the inconvenience. If you have further questions,

welcome to contact with our service department.



The input/output terminals and the test column may bring voltage, when you plug/draw the test wire or power outlet, they will cause electric spark. PLEASE CAUTION RISK OF ELECTRICAL SHOCK!

Company Address:

- T4, No. 1, High-tech 2 Road, East Lake High-tech Development Zone, Wuhan
- Sales Hotline: 86-27- 87457960
- After Service Hotline: 86-27- 87459656
- Fax: 86-27- 87803129
- E-mail: whhuatian@163.com
- Website: <u>www.whhuatian.com</u>

SERIOUS COMMITMENT

All products of our company carry one year limited warranty from the date of shipment. If any such product proves defective during this warranty period we will maintain it for free. Meanwhile we implement lifetime service. Except otherwise agreed by contract.

SAFETY REQUIREMENTS

(-)

Please read the following safety precautions carefully to avoid body injury and prevent the product or other relevant subassembly to damage. In order to avoid possible danger, this product can only be used within the prescribed scope.

Only qualified technician can carry out maintenance or repair work.

--To avoid fire and personal injury:

Use Proper Power Cord

Only use the power wire supplied by the product or meet the specification of this produce.

Connect and Disconnect Correctly

When the test wire is connected to the live terminal, please do not connect or disconnect the test wire.

Grounding

The product is grounded through the power wire; besides, the

ground pole of the shell must be grounded. To prevent electric shock,

the grounding conductor must be connected to the ground.

Make sure the product has been grounded correctly before connecting with the input/output port.

Pay Attention to the Ratings of All Terminals

- 2 -

To prevent the fire hazard or electric shock, please be care of all

ratings and labels/marks of this product. Before connecting, please

read the instruction manual to acquire information about the ratings.

Do Not Operate without Covers

Do not operate this product when covers or panels removed.

Use Proper Fuse

Only use the fuse with type and rating specified for the product.

Avoid Touching Bare Circuit and Charged Metal

Do not touch the bare connection points and parts of energized equipment.

Do Not Operate with Suspicious Failures

If you encounter operating failure, do not continue. Please contact

with our maintenance staff.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in Explosive Atmospheres.

Ensure Product Surfaces Clean and Dry.

Security Terms

Warning: indicates that death or severe personal injury may result if proper precautions are not taken

Caution: indicates that property damage may result if proper precautions are not taken.

Contents

1.	Model: JFD-2000A
2.	Brief introduction
3.	Structure
4.	Main specification
5.	Product Features
6.	A brief introduction of partial discharge Atlas
7.	Operation9
	➢ Boot interface
	Analysis Part
	Analysis of database
EX	TERNAL CALIBRATOR TYPE JFD-2000A27
1.	Brief introduction
2.	Technical specification27
3.	Operation
IN	PUT UNIT
1.	Introduction
2.F	rimary TechnicalSpecification29
3.I	nput Impendence Selection

1. Model: JFD-2000A

2. Brief introduction

Be suitable to measure and monitor the partial discharge of transformer of any voltage grade, generator, arrester, tube, GIS, capacitor, cable, switch, and other electrical–equipment which work in high-voltage.

3. Structure

- 3.1 Screen: 15' true-color TFT LCD screen, Industrial high brightness; Resolution: 1024×768; 4 bits LCD displays voltage.
- 3.2 Hardware interface: USB, Power Interface, 2-channel input signal terminal; to ground terminal; input outer trigger signal; RJ45; RS232;
- 3.3 Figure size: length × width × height (540×460×320) mm
- 3.4 Weight: 18kg.

4. Main specification

- 4.1 Measuring channel: 2 Independent channels
- 4.2 The capacitor range of test sample: 6pF~250µF
- 4.3 Test precision: 0.1pC

4.4 Sample precision: 12bit; Sample Rate: 20M/S

4.5 Display Mode

(1) Display Mode: Ellipse —— Sine —— Line

(2) Tigger mode: Inner trigger mode and outer trigger mode; Inner trigger mode is triggered by power, 50Hz; Outer trigger mode is to synchronize the power frequency, can be any value between $50 \sim 400$ Hz.

(3) The voltage range of outer trigger signal: 10~200V, Input power <1VA

(4) Distinguish the signal phase: Ellipse displays signal with the method of polar, Sine displays as the sine wave, it's start is the zero position of phase of test power, it's length is a circle of the test power, the system exactly displays the circle, phase of the test power in the outer trigger mode.

4.6 Time Base: you can select the phase dynamically, amplify the time base dynamically

4.7 Filter frequency band

(1)) On low frequency 3dB, f_L: 10, 20, 40kHz optional

(2)) On high frequency 3dB, f_H: 80, 200, 300 kHz optional

(3)) f_{L} and f_{H} can be freely combined to form any filter band

4.8 Amplifier

(1) Gain adjust: gross adjustment and fine adjustment, 5 grade in gross adjustment, Gain difference between grades is 20±1dB, fine adjusting range >20dB

(2) The Asymmetry of positive, negative polar response of amp: <1dB

4.9 Partial discharge measurement

it can measure in the continous and amplified mode, the deviation: $\pm 5\%$. (measured in full scale)

4.10 Data store and display。 It can print and generate standard test report

4.11 Work temperature: -10~45°C, Relative humidity: ≤95%

4.12 AC220V; Frequency 50Hz; 300W

5. Product Features

- 4 partial discharge measurement channels sample, process, display independently;
- Inner, Outer trigger mode for options. Have zero mark indicator and can distinguish phase;
- Display mode: Ellipse, Line, Sine;
- > Single partial discharge pulse wave analysis, to analyze it's character;
- Support to store test wave and data, playback and analyze the stored test record;
- Gain: Adjust each channel independently, it doesn't interfere other channels, and doesn't change the measurement result of other channels;
- Support capture some special or random wave and to have specific analysis;
- > Anti-noise, can get rid of the interfere noise which fixed in phase;
- Anti-noise with filter, can filter out the random noise which is not synchronized with power;
- Bandpass filter adopts analog and digital filter methods, the band can be freely combined to restrain any interferes;
- Freely select within 360° with single window mode, double window mode;
- Display test voltage while measuring the partial discharge;
- Support measure, time and wave analysis with the partial discharge record;
- > Display partial discharge figure in 2D, 3D.

Freely store, print partial discharge picture, data, and automatically generate test report;

6. A brief introduction of partial discharge Atlas

6.1.3 Different ways of connecting the measuring piece with the input unit(Fig.3).







Fig.3b. serial connection







Fig.3d. Bridge connection

In these figures:

Cx--measuring pieces; Ck--coupling capacor; Z--damping impedance; R3, C3, R4, C4- the balance impedance in bridge connection.

6.1.4 Connect the resistance divider or capacitive divider to testing voltage, then connect the output with "to high voltage resistance" outlet (31) on back panel by the cable.

6.1.5 The partial discharge measuring circuit. (Fig.4)



Fig.4, Standard connecting circuit of partial discharge measuring (parallel connection).

A—primary beginning of input unit;

C—central tap of input unit;

- B—primary end of input unit;
- E—ground of input unit

7. Operation

Boot interface

1. Basic function

After the software is started, you will see the following interface.



You can choose: creating tasks, data analysis, soft keyboard, and help.

1.1 Creating tasks

When using the digital database management system, users only need to open the directory, and select the appropriate database project files. This method provides convenience for video storage, analysis of more users and test records management of the product.

Click the Creating Task button to open the creating test task and create the dialog box for the current workspace, as the following picture:

DataBase:	123	
Path:	D:\我的文档	
Creator:	1234	
Create	2017-9-11 16-37	
Select Da [.]	taBase	
Select Da L.Select ex	taBase	Select

The software will automatically open the database which you selected last time.

If you want to select a new database, you can click [Select existing workspace] button, and the following dialog box will be appeared:

打开					? 🛛
查找范围(I):	1 我的)文档	•	← €	r 🗐 🕈
CGP df2Wor Data Downloads Inventor QQPCMgr Tencent F:	iles C	WeChat Files Youku Files 美图图库 收藏夹 图片收藏 我的扫描件	把 前 初 频 世 新 的 形 状 世 我 的 音 乐 世 和 的 音 乐 □		
文件名 (M): 文件类型 (T):	P. D. Wor	kspace Files()	*. dsp)	•	打开 (0) 取消

Attention: the name of the selected database must be the one with .Dsp suffix. A database includes the following parts: (1) engineering database files

with .Dsp suffix; (2) database files; (3) Data directory of the test task

Click the [create new workspace] button and the following dialog box appears:

Select Vorksp	ace	×
Create Vorkspa	ice.	×
———— Create	Vor	
Workspace	123	
Work	D:\我的文档	Select directory
Creator:	123	
Note:		
		Cancel OK
	< 上一步 (B) 下一步 (B) >	取消

Fill in the name of the corresponding project, and select the directory where the database works, and then click the completion button. After that, click the [next] button to enter the test task interface.

20179111638 (2)	017-9-11 16-38)	Workspace Nam 123	e i	forkspace 2017-9-11	Crea 16-
<					>
Fill Task In Fill Task In	fo 1 fo				
Task Name: Address: Operator:			Auto (Gen.	
Test Time: Test Note:	2017-9-11 16-43		Refre	esh	

You can either select an existing test task or create a new task. Click the interface to select the existing task button, select a test task from the existing task list and double-click or click the completion button, the system will enter the measurement interface.

You can also choose to create a new task button, and then click the completion button, the system will create a new test task, and enter the measurement interface.

1.2 Data Analysis

1.3 Soft Keyboard

Click the keyboard button, you can open the software's auxiliary keyboard, as the following picture:



1.4 Help

Click the help button and you can open the help document.

Analysis Part

1. Introduction of the Software function

Open the PD measurement interface as follows:

Digital Part	int Discharge Detecto	x-20179111060 (2017-!	-11 10-50) (DataBaan:	1110		. 6
Hack CI 1	CH 2 CAL Setting	Report KeyBoard Belp	BP. : 20kHz-200KHz	@Stop	100	BP.: 40kHz-80KHz
h: 1 (√) [S Sef. valus: 0.00	imple] ipC		AEP.: range 7	ch: 2 [Sample] Ref. value: 0.60	рС 9С	AIP.: range 4
				$) \leftarrow$		< /
H : 1 Freq Tagger: Outer	Operations Mode: Ellipse ¥ Op. Normal ¥	Ref. Set Ref. I Show Ref Ref. Value: 0.00	To Set	CH : 2 Prog Tagger Outer	Operations Ref. Set Mode: Size V Op. Normal V Step: 2	7 Show Pat. .60 1 10 .00 Set
Camera Camera Start Video	Selection: Double - Zero T Show Zero : Clear Selection: Clear erase Rotation: Rotate 0 •	Calbrate CAL val. 50.0 pC Range V	Californite	Storage Common Start Video Story Video	Selection: International Calibrate Zero 77 Show Zero Clear Selection: Clear ense Rotation: Rotate 0	0.0 pC Calbrate mage: 4 v

Figure 1 the PD Test interface

The interface includes three parts: (1) discharge status panel; (2) waveform display form; (3) channel control panel.

1.1 discharge status panel

The panel includes: discharge display window, test voltage display window, [run] control button, [coarse] label, [bandwidth] tab, [limit] status button. [Limit] button only will be activated for users to click after the discharge exceeds the set limit threshold.

1.2 waveform display form

The window will display real-time partial discharge waveform. If using the calibration function, [calibration value] to describe the character will also be displayed.

1.3 channel control panel

The panel display modules include: [display mode], [mode of operation], [window selection], [display properties], [clear window selection], [clear blanking], [rotation angle], [calibration settings], [storage management].

[Display mode]: There are three ways to show: elliptic model, sine model, linear model. The real-time current time base frequency will be displayed in the system parameter panel.

[Mode of operation]: There are four modes, namely conventional mode, window selection mode, amplification mode, blanking mode.

[Window selection]: This option is valid only in the windowed mode, and in other modes it is not clickable. You can select a single window, double window, or multiple windows.

[Display properties]: It indicates whether the zero mark on the display. The zero mark represents the display time of 0 degrees; 180 degrees under the zero mark represents the position of time.

[Clear window selection]: If the [Clear window selection] was selected in the current window, the operation will remove it. The window selection operation of the current channel is canceled.

[Clear blanking]: If the [Clear blanking] was selected in the current window, the operation will remove it. The previous blanking settings will be canceled

[Rotation angle]: For rotating the display part of the signal, the signal and the zero mark will rotate clockwise together, as shown in Figure 2.

[Calibration settings]: To set the calibration value, and move the calibration line.

[Storage management]: To grab the video and the current window of the discharge graphics. The graphics is stored in the form of JPG in the current task directory.

Digital Partial Discharge Unincise-20170111050 (2017-9-11 10-50 (DataManne 1111) /ls/) /set/press) 0.100 0.201 habit ha	
ch: 1 (√) [Sample]	BP.: 40kHz-80KHz ARP.: range 4
Ref. value: 0.00 pC	Ref. value: 0.60 pC
CH : 1 Operations Raf. 54. Freq:	CH : 2 Mode: Size Tegge: Outer Storege Cater Start Video Start Video Start Video Start Video Start Video Start Solone Part Part Solone Part Solone Part Part Solone Part Solon

Figure 2

2. Adjustment

When carry on the PD Test measurement, connect the external test circuit and the hardware module correctly,

Calibrate	Measure Range:
Channel: ch: 1 💌	range 1
	range 2
	range 3
CAL. Value Jour PC Calo	range 4
	range 5
J Success and Finish	range 6

Figure 3 Adjustment panel

The system corrects the correction value automatically. The operation is as following:

2.1 The calibration pulse generator is connected at both ends of the PD test circuit.

2.2 Select the test channel which needs correction. The display window of the selected channel will display the symbol "V" (Note: the correction channel must be the current acquisition correction pulse generator channel).

2.3 Start the selected channel. In the upper panel of the channel display, click the stop button, and if the device is connected properly, the button will

become the run button. The icon on the left will become green, indicating that the channel is in the acquisition state; if the button displays the contents of [wait], indicating that the system is finding the digital substation hardware devices. If the device cannot be collected, you must find the problem, or the next step cannot be carried out.

2.4 Select the correction button from the toolbar and fill in the value in the correction value input box of the correction panel according to the input amount of the external correction pulse generator.

2.5 Press the [auto correction] button to correct automatically. After 3~4 seconds, the correction will be ended. If the communication fails, or the correction timeout occurs, you can click the [auto correction] button again to complete the calibration.

2.6 When calibration is done, be sure to disconnect the calibration pulse generator.

In the correction process, it should be noted that: It needs to take a series of measures to remove interference; at least the signal should be greater than the interference significantly, otherwise it will affect the results of system correction. Select the appropriate filter to filter out the obvious interference signal. Low frequency is 20kHz, high frequency is 200kHz by default. You can also use software windowing, blanking method to get stable, reliable calibration pulse generator signal.

3. Setting system parameter

In the PD test, you sometimes need to set the scope of the filter, the display effect and so on. Click the [parameter settings] button on the toolbar to open the system parameter settings panel as shown below:



3.1 System trigger mode

The system provides two trigger options: internal trigger and external trigger. Selecting here will be valid for each channel of the system. Internal trigger: the trigger frequency is the power frequency of the instrument, usually 50Hz. External trigger: The user access to a frequency of power, to control the system display cycle frequency.

3.2 Threshold of limitation

The amount of discharge displayed by the system is the peak of all discharge values in the whole trigger period. Set a limit of pC. When the discharge peak is bigger than the limit threshold, the limited lights will be flickered on the window of the corresponding channel. When the discharge peak is lower than the limit threshold after 3~5 seconds, the limited lights will stop flickering.

3.3 Range switching

In the PD test, due to the change in the discharge, the current magnification cannot meet the requirements of the measurement, or the signal becomes smaller. It needs to amplify to observe the signal in detail. **Note:** The peak value of the discharge is not directly related to its height. It is different in different ranges; so the amplitude change caused by the range conversion is normal.

Selecting the [auto switch] button, it will make the current choice of the channel into the automatic switch. If the current value is higher than the maximum value of the switching range, the system will automatically be down one step; if the minimum value is lower than the current switch range, then the system will automatically be up one step. If the "manual switch" button is selected, the system will measure all the values in the current range regardless of the amount of pC input.

3.4 Fine location

Fine tuning refers to the current position within the system to enlarge the number. When the automatic correction is completed, the fine location will be updated. The system will automatically adjust the tuning up to the appropriate location, so we do not recommend the user to set the first position here. If the user fails to set the fine position, the fine interface will automatically switch to the last fine position.

3.5 Filter

Filtering is mainly used for anti-jamming. Before correcting, we can select the filtering bandwidth to filter the current noise to get a relatively clean discharge signal.

4. System display mode

Three modes: sine mode, ellipse mode, line mode.

Digital Partial Bischarge Detector-20179111638 (201 911-09) Viec09 Configure 55 Ch 1(k) Ch 2(8) Tasket09 Tasket0 Tasket09 Task	7-9-11 16-38) (DataBase: 123) ApOD		2
Here Hart CH 1 CH 2 CH. Setting Report KeyBoard Help	A Eat		
000	BP. : 20kHz-200KHz	000	BP. : 40kHz-80KHz
UUU _{PC}	ANP.: range ?	WWU _{pc}	ANP.: range 4
ch: 1 [Sample] Ref. value: 0.00 pC	ch: Ref.	2 (√) [Sample] value: 0.60 pC	
			-
CH : 1 Certain Ref. Set Ref. P Show Ref.	CH	Coperations	Ref. Set Ref. 🗭 Show Ref.
Freat Ref Value: 0.00	To	Freq:	Ref Value: 0.60 To
Op. Normal -		op semat	
Trigger. Outer Storage Storage Storage	Set I	ingger. Outer Selection: Multi +	Step: 5.00 Set
Trigger: Outer Storege Statesien: Dauble Storege Camera Zero Show Zero. CAlbrare CAL val. 30.0 r	Ser T Stor	Opp Cernal ✓ Selection: Multi ✓ Camera Zero ✓	Step: 5.00 Set Calibrate CAL val. 30.0 pc Calibrate
Tragger. Outer Seneral Y Storage Camera Zero Store Zero Start Video Clear Solection Clear rease CAL val. 50.0	Ser I Stor	ringen: Outer Selection: Multin → Camera Zero ♥ Show Zero Start Video Clear Selection: Clear enase	Step: 3.00 Set Calibrate Calibrate D.C. Calibrate Range: range: 4 •

Sine mode



Ellipse mode

Digital Partial Discharge Detector-20179111638 (2017-9-11 16-38) (DataBase: 12 7(1)(7) -Vjer(V) Configure(S) Ch.1(0) Ch.2(0) Taik(0) Teal(T) Majo0	0	-0>
😓 🧾 😰 🧼 🗶 🗋 📟 🚱 🞉 Rock (11.1) (11.2) (21. Sorting Report Koylbard Boly Filt		
BP. : 20kHz-200KHz	000	RP. : 40kHz-80KHz
ALP.: range ?	WWU _p c	AIP.: range 4
eh: 1 (√) [Sample] Ref. value: 0.00 pC	eh: 2 [Sample] Ref. value: 0.00 pC	
CH 1 Freq. Mode: Trigger: Outer Starty Solection: Start Video Clair Selection: Start Video Clair Selection: Starty Video Clair Selection: Starty Video Clair Selection: Starty Video Clair Selection: Starty Video Clair Selection:	CH : 2 Freq. Operations Trigger Outer Starger Canna Start Videe Start Start Canna Start Start Start Start Canna Start S	ew Ref To Set pC Calibrate aread @ Auto

Line mode

5. Calibration function

The digital discharge window on the panel shows a discharge waveform. It shows the discharge peak in the period of the current discharge trigger above the panel. If you want to see the detailed discharge value, you can use the calibration function to achieve.



The calibration function is located in the right control panel.

	定设置 ——— ▼ 显示标定		
标定值:	27.01	*	标定到
步长值:	1.21		设定

Specific operations are as follows:

5.1 Before using the calibration function, select the current channel first.

The current channel which is selected in the display window will be with a " $\sqrt{}$ " symbol.

5.2 Select [show] button, calibration value: 27.5pC will be showed at the top of the window to specify the current calibration value. The calibration value is the same as the value shown in the calibration option of the right panel. If the calibration value is too large or too small, it will not be visible beyond the display range of the measurement window, but it is displayed.

5.3 Set the calibration value: users can enter the value directly from the right panel. Then click [calibration] button, the channel display window calibration line will be displayed in the current position of the calibration value.

5.4 Modify the calibration value: Fine calibration value can adjust the display window position calibration, and the calibration value will be changed. The change step of the calibration value is set according to the [step size] button.

5.4.1 Using the mouse wheel to move the display window calibration position.

5.4.2 Using the arrow button on the right side of the [calibration value] button in the right panel to change the calibration value.

5.4.3 Using the upper and lower keys on the keyboard to change the calibration position.

Note: When the calibration value shows negative value, it indicates the negative direction of the discharge value.

6. Test report

If you need to print the test report in the PD Test, you can click the toolbar to open the edit window of the test report, as the following picture:

Company:			
Report No.:			
Test Place:			<u> </u>
Temp.		- Equipment	
Temp.:		PD Detector:	
RH:	%RH	Calibration Device:	
Test			
Prod. Name:			
Prod. Type:			
Prod. No.:			
Others:			
Test Time: 2017- 9-11	•	Tester Name:	
Test Dept.:		Review:	
Manager:		1	
PD picture:			
		All All marked p	
			<u> </u>
Refresh(ch	1)	Refresh(ch	2)
Conclusion:			- 22

The report will be kept as a Word document.

6.1 Screenshot refreshing function

Users can click [refreshing picture] button to refresh the screenshot of any channel.

6.2 Storage

Users can put some parameters in the form of a file on the hard disk. When fill in the test report, users can choose the previous parameters through the [import parameters] button.

Click the [generate WORD report] button to create the WORD report:

Partial Discharge Test Report

Test No.:			
test department:			
Test man:		Test Date:	2017-9-11
department:			
review:		manager:	-
test object:			
product name:		product type:	
product no.:			
test enviroment condit	ions:		
test place:		temp. :	°C
humidity:	%RH		
test enviroment condit	ions:		
pd measure device:		CAL. pulse generator:	
ch 1 test record:			209
试验电压:	0.00 kV	pd value(pC):	0.00
CAL. pC:	50.00	range:	range -26851
lowpass FL:	20kHz	highpass FH:	200kHz
synchro-type:	Outer	synchro-freq:	50000
ch 2 test record:			
试验电压:	0.00 kV	pd value(pC):	0.00
CAL. pC:	50.00	range:	range 4
lowpass FL:	40kHz	highpass FH:	80kHz
synchro-type:	Outer	synchro-freq:	

Analysis of database

1. Test database inquiry

Click the query button on the toolbar to open the database query interface.

.1 workspace:				Inquery Works	space:			
Workspace Name	Creator	Crea	1	Workspace Na	ame	Creator		Create
123	1234	2017	Open					
			Delete					
			Right >					
	打开					? ×		
<	查找范围(I):	🕒 我的文档		• + 6	È d'	-		
)
Condition	CGP df2Word	. 🗀 WeCha	t Files 📕	我的视频				2
Condition	CGP df2Word	. 📄 WeCha Couku	t Files 🖡	我的视频 我的形状				
Condition	CGP df2Word Data Downloads	 □ WeCha □ Youku □ 美图图 	t Files 🔮 Files 🔮	我的视频 我的形状 我的音乐			_	
─────────────────────────────────────	CGP df2Word Data Downloads Inventor		t Files (Files (日库 (そ) 短期	我的视频 我的形状 我的音乐 123. dsp			Quer	y
Condition Cine Span 20 Cine Spa	CGP df2Word Data Downloads Inventor QQPCMgr Tencent Fi	→ WeCha → Youku → 美智智 ☆ 收藏尹 	tFiles Files 日库 G 反 液 司 苗件	我的视频 我的形状 我的音乐 123. dsp			Quer	у
Condition Cime Span ²⁰ Ciask Name Query res ask Name	CGP df2Word Data Downloads Inventor QQPCMgr Tencent Fi	 □ WeCha □ Youku □ 美图图 ☆ 收藏身 □ 图片收 1es □ 我的打 	t Files Files 日库 在 医 政藏 日描件	我的视频 我的形状 我的音乐 123. dsp			Quer Bate	y . Task
Condition C Time Span ²⁰ T Task Name Query re: ask Name	CGP df2Word Data Downloads Inventor GQPCMgr Tencent Fi 文件名(N):	□ WeCha □ Youku □ 美图图 ☆ 收藏列 ── 美图 りけい les □ 我的打	t Files Files 日库 在 支藏 日描件	我的视频 我的形状 我的音乐 123. dsp	打	开 (0)	Quer	y . Task
Condition Time Span 20 Task Name Query re: ask Name	CGP df2Word Data Downloads Inventor QQPCMgr Tencent Fi 文件名 QN): 文件类型 (T):	WeCha ○ Youku ○ 美智慧 ☆ 收藏身 經 图片收 les ○ 我的打 P. D. Workspace	t Files Files 日库 € 登 報 日描件	我的视频 我的形状 我的音乐 123. dsp	<u></u>	开 (0) 取消	Quer Bate	y . Task
Condition Time Span 20 Task Name Query re: ask Name	CGP df2Word Data Data Dwnloads Inventor QQPCMgr Tencent Fi 文件名 (M): 文件类型 (T):	→ WeCha → Youku → 美智問 → 收藏灵 ④ 图片中 les → 我的打 F. D. Workspace	t Files Files 日本 を 文確 日描件	数的视频 数的形状 我的音乐 123. dsp		开 (0) 取消	Quer	y Task
Conditio Time Span 20 Task Name Query re: ask Name	CGP df2Word Data Downloads Inventor QQPCMgr Tencent Fi 文件名 (M): 文件类型 (T):	· · · · · · · · · · · · · · · · · · ·	t Files Files 日庠 在 文藏 日描件	我的视频 我的形状 我的音乐 123. dsp	<u>1</u>	开 (0)	Quer	y . Task
Conditio	CGF df2Word Data Downloads Inventor QQFCMgr Tencent Fi 文件名 (M): 文件类型 (T):	· · · · · · · · · · · · · · · · · · ·	t Files Files 日库 在 文藏 日描件	我的视频 我的形状 我的音乐 〕123. dsp	I	开 (0) 取消	Quer	y
Condition	CGP df2Word Data Downloads Inventor QQPCMgr Tencent Fi 文件名 (M): 文件类型 (T):	· · · · · · · · · · · · · · · · · · ·	t Files Files 日库 そ 定 液蔵 日掛件	我的视频 我的形状 我的音乐 〕123. dsp	1	开 (0)	Quer	y . Task
Condition Time Span 2 Task Name Query re: ask Name	CGP df2Word Data Downloads Inventor 99PCMgr 了Tencent Fi 文件名 00): 文件类型 (T):	· · · · · · · · · · · · · · · · · · ·	t Files Files 日年 臣 王 王 田 王 田 田 田 田 田 田 田 田 田 田 田 田 王	我的视频 我的形状 我的音乐 123. dsp	I	开 (0)	Quer	y . Task

Figure 6 the database query interface

Steps:

1.1 Add database to the database query module.

Select [add] button, it will open dialog box of the DSP database. Then select the correct database files to the left of the database file list, as shown in Figure 6.

1.2 Add the database file which needs to be queried from the database that has already been added.

The conditions of the query database file can be selected: (1) the time of creation; (2) the name of the task; (3) the task executor

1.3 Fill in the database query conditions, and then click the [query], the current selected database files will be queried one by one, the resulting database records will be displayed in the list below.

I WOIKSpace.	1			Inducty wo	respace		1-
Workspace Name	Creator	Crea	Open	Workspace	Name	Creator	Create
123	1234	2017	open				
			Delete				
			Right >				
			Left <				
<		>		<		1	>
Condition Cine Span 201 Cines Name Query rest	7- 9-11 💌	-> 2017- 9-11	eato		J.	ead All	Query
Condition Time Span 201 Task Name Query resu	.7- 9-11 <u>-</u>	-> 2017- 9-11 Task Cre Workspace Nam	eato me Work:	space Dreat	F e Date	ead All	Query te Task
Condition Time Span 201 Task Name Query resu ask Name	7- 9-11 <u>▼</u> ult	-> 2017- 9-11 Task Cre Workspace Nam	eato me Work:	space Dreat	F e Date	ead All	Query te Task
Condition Time Span 201 Task Name Query resu ask Name	7- 9-11 <u>-</u>	-> 2017- 9-11 Task Cre Workspace Nam	ne Work:	space Dreat	F e Date	ead All	Query te Task
Condition Time Span 201 Task Name Query resu ask Name	7- 9-11 💌	-> 2017- 9-11 Task Cre Workspace Nam	eato me Work:	space Dreat	F e Date	ead All	Query
Condition Time Span 201 Tiask Name Query resu ask Name	7- 9-11 💌	-> 2017- 9-11 T Task Cre Workspace Nag	eato me Work:	space Dreat	F e Date	ead All	Query
Condition Time Span 201 Tiask Name Query resu ask Name	.7- 9-11 💽	-> 2017- 9-11 Task Cre Workspace Nat	me Work:	space Dreat	e Date	ead All	Query
Condition Time Span 201 Task Name Query resu ask Name	.7- 9-11 💽	-> 2017- 9-11 Task Cre Workspace Nat	ne Work;	space Dreat	e Date	ead All	Query

Figure 7 Query results

1.4 Select a test task record from the query's list; then double-click to open the dialog box for the test task to record details.

工作区名称	创建者	创建时间	Π	工作区名称	创建者	创建时
			添加	12345		2010年
	当前任务文件管理			139010	×	2010年
			付付信息。			2010年 2010年
	视频文件	12 時	11劳1百息:			
	y2010-m12-d5-h1	1.5 帧	任务名称:	201011221032 (2010)年-11月-22E	
			创建日期:	2010-11-22 10:32:2	21	
查询条			创建者:			
匚 时间条件			在发世诗:			
1 cal-autor			11.26.18945			
厂 任务名称						
						查询
nter Mit Are						
—— 查询性						At Automatic
主务·石称 01011221341						分別建省
01011221345				1		
01011221032	-					
01011191444 0101119147		2				
01011191348	任务目录: C:\Docum	ents and Settir	ngs\Owner\桌面\亲	f建文件夹 (5)/Data/2	2010: 打开目录	
	VIDEO路径:				打开录像	
						1

Figure 8 Page of record

The list on the left is a list of stored video files, double click, and the following information will be displayed in the current path of the selected video files. Click on the right of the [Open Video] button, it will be placed in the video playback screen.

2. Analysis of two dimensional, three dimensional

Digital PD test system provides the functions of test record database management and analysis

Open the video analysis, as the following picture, and take the detailed method of operation test.



Blanking part cannot be included in the discharge value; the window can be included in the selected part of the discharge value. Open the video analysis panel and you can see there is a corresponding change in each video analysis due to a series of operations in the video playback.



Figure 9 Discharge capacity- Discharge times







Figure 11Phase discharge



Figure 12 Phase- Discharge times



Figure 13 Time-Phase-Discharge capacities

3. Video playback

Click the [video playback] button; the video playback interface will be shown as following:

视频回放	控制台
——文件	· · · · · · · · · · · · · · · · · · ·
打开文件	件 二维、三维分析
—— 播放	控制:
	<u> </u>
「暫停」	
(Landing and	
——媒体	信息:
总帧数:	28 当前帧: 3
创建日期:	2010年-10月-20日 17时·创建者:
文件路径:	C:\Documents and Settings\Owner\桌面\新建文件夹 (5)\Data\23456 (2010年-10月-20

Functions that can be used: [next frame], [last frame], [fast forward], [rewind], [stop], [pause].

3.1 Fast forward、 rewind

Move forward or backward into 10 frames from the currently displayed frame.

3.2 Single step

[Next frame], [last frame]: convert the video playback from the playback state to the suspended state.

3.3 A B Partial Play

A B Partial Play: Select a video of the two frames, and then control the continuous playback between the two frames. Click [>] button and it will trigger the current play into AB playback mode.

3.4 Video analysis

If you want to analyze the video of the two dimensions or the three dimensions, you can click [two-dimensional, three-dimensional analysis] button

to open the analysis panel.

EXTERNAL CALIBRATOR TYPE JFD-2000A

1. Brief introduction

JFD-2000A is a partial discharge calibrator. Supplied by battery, small size, and light weight, easy to carry and synchronize.

This calibrator can output calibrating pulse of 1.2 kHz to the produce with different output range. It is suitable for every experiment circuit recommended by IEC-270.

2. Technical specification

2.1 Calibration pulse range: 5pC, 10pC, 20pC, 50pC

- 2.2 Polarity: plus and minus alternate
- 2.3 Frequency Adjust: 1.2 kHz
- 2.4 Frequency change range: >±100Hz
- 2.5 Pulse rising edge: <60nS
- 2.6 Pulse falling edge: >100uS
- 2.7 Input capacitance: 10pF
- 2.8 Calibrating charge deviation: Eq=(Eu²+Ec²) ½≤±10%
- 2.9 Dimension: 160×125×50mm³
- 2.10 Weight: 0.5kg
- 2.11 Battery: 6F 22
- 2.12 Battery voltage: 9V

3. Operation

After unloading, check model, size on the nameplate.

3.1 Open the back panel, and then install the battery.

3.2 Connect the testing wires to the red and black terminals. The red wire should be short and connect with the high voltage side of the product, connect the black wire to the low voltage side.

3.3 According to the different products, set the "Pulse Ranges" switch to different position of 5pC, 10pC, 20pC, 50pC.

3.4 Set "Frequency Adjust", the frequency of calibrating pulse can be adjusted near 1.2 kHz (adjust the calibrating pulse synchronously).

3.5 The voltmeter on front panel indicates the voltage of the battery. If the reading of the voltmeter is under 7V, please change a new battery to keep normal work of the calibrator.

3.6 To avoid the calibrator being damaged by high voltage. After the calibration, the calibrator should be disconnected with the product.

INPUT UNIT

1.Introduction

Input unit is an important component that extracts partial discharge signal from the test circuit. It is also named input impendence. The input unit series including No.1 to No.12 and 7R, which is compliant with the IEC270 suggested test circuits (balance circuit, series circuit, parallel circuit). This input unit adopts high frequency transformer 2 resonance input circuit. Its primary circuit is LCR circuit; its primary side inductance is within the partial discharge detector amplifier band width and is resonance of the equivalent capacitance of the test circuit.

2.Primary Technical Specification

			RMS Of max	c. current
No.	Tuning capacitance range	(Un-balance circuit)	(Un-balance	(Balance
			Circuit)	circuit)
1	0 ~ 25 ~ 100pF	0.02	30mA	0.25A
2	25 ~ 100 ~ 400pF	0.04	50mA	0.5A
3	100 ~ 400 ~ 1500pF	0.06	120mA	1A
4	400 ~ 1500 ~ 6000pF	0.1	0.25A	2A
5	1500 ~ 6000 ~ 25000pF	0.2	0.5A	4A
6	$0.006 \sim 0.025 \sim 0.1 \mu F$	0.3	1A	8A
7	$0.025 \sim 0.1 \sim 0.4 \mu F$	0.5	2A	15A
8	0.1 ~ 0.4 ~ 1.5μF	1	4A	30A
9	0.4 ~ 1.5 ~ 6.0μF	1.5	8A	60A
10	1.5 ~ 6.0 ~ 25μF	2.5	15A	120A
11	$6.0\sim 25\sim 60 \mu F$	5	25A	200A
12	25 ~ 60 ~ 250μF	10	50A	300A
7R	Resistor	0.5	2A	15A

3.Input Impendence Selection

Selecting a proper input unit can acquire better sensitivity. The principle choosing the input unit is that its resonance frequency F0 with LCR is within the amplifier bank width. The operating method is: the equivalent capacitance of the test circuit which is connects in series with the primary side of the input unit. It must be at about central point of the resonance range described on the nameplate of the input unit. This input unit the best input unit for this test circuit. The middle capacitance value is the square root value of the multiply value of capacitance at 2 terminal. Selecting this input unit will get best sensitivity.