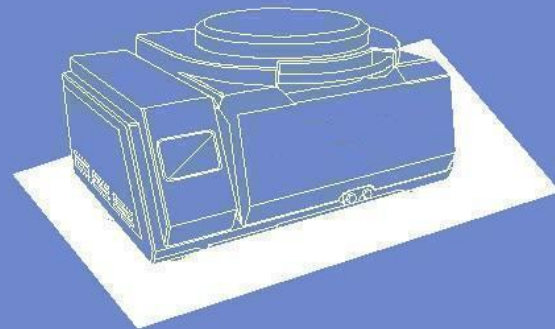


EDX3600H

Manual(Hardware)



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Contents

I	Precautions	
1.	1 Special Notes	1
1.	2 Important Utility Notes— Please do read them.	2
1.	2. 1 Important Safety Notes	2
1.	2. 2 Installation	3
1.	2. 3 Operation	4
1.	3 Precautions	4
1.	3. 1 Application	4
1.	3. 2 Ambient environment	
II	Product Overview	
2.	1 Introduction	5
2.	2 Unpacking and checking	6
2.	3 Parts and functions	7
III	Installing the instrument	
3.	1 Installation precautions	9
3.	1. 1 Requirements of ambient environment	9
3.	1. 2 Unsuitable places for installation	10
3.	2 Connecting the instrument	14
IV	Operating the instrument	
4.	1 Operation precautions	15
4.	2 Operating the instrument	15
4.	2. 1 How to switch the power on	17
4.	2. 2 How to put in and take out the sample	18
4.	2. 2 How to put in and take out the sample	20
V	Repair and maintenance	
VI	Trouble-shooting	
6.	1 Common hardware failures and their solutions.	22
6.	1. 1 No high voltage indicator light in measurement process	22
6.	1. 2 Other hardware failures	22
6.	2 Printer problems	24
VII	Maintenance statement	

Precautions

1. 1 Special notes

For better understanding and more attention arousal, we use in this manual the following caution marks as we touch safety information or other crucial points. They are listed in different grades and are indicated as follows:

- ◆ Warning--- This denotes information, if ignored, may result in high risk.
- ◆ Caution--- This denotes information, if ignored, may result in middle risk.
- ◆ Note--- This denotes information, if ignored, may result in low risk.
- ◆ Please not--- This indicates the operation is forbidden.
- ◆ Avoidance--- This shows there are safety or other information we should attend to.

Safety information contained in this chapter is incomplete. To assure your security and interest, we put some of them in the latter parts of this manual. Wherever they are, you should read them carefully.

Similarly, equal attention should be paid to other information contained in this manual besides the items introduced by caution marks.

Precautions

1 . Important usage notes---Please do read them.2

X-ray Fluorescence Spectrometer is a hi-tech product of highly sophistication. Please do read the following application notes carefully.

1 . Important safety notes21



Note:

Please do read these important safety notes carefully before operating the instrument. These instructions are designed to avoid harm to the users (or others) or damage to the property. Further, do not carry out any operation unspecified in the manual. They may cause unexpected accidents or damages. Improper operation may result in personal injury and/or machinery failures. And the related repair fares may not be covered by the limited warranty terms.

1 . Installation22



Warning:

✘ Please do not install the instrument near alcohol, paint thinners or inflammable substances.

✘ Please do not place glass, vase, flowerpot and other water or liquid container onto the instrument.

✘ Please do not block its ventilation hole or hinder its heat dissipation.
(Any breach of the above warnings may result in fire hazard or electric shock.)

Caution:

✘ Please do not install the instrument on an uneven surface.(e.g. uneven desktop, floor or bracket)

✘ Please do not install the instrument on a soft surface. (e.g. on sofa or carpet).

✘ Please do not install the instrument to a place vulnerable to strenuous vibration.

(Any breach of the above cautions may cause damage to the instrument or even harm to the operator.)

Note:

Please do not install the instrument to a damp or dusty place.

Please do not install the instrument to a place near a tap or water source

✘ Please do not install the instrument to a place exposed to direct sunlight

✘ Please do not install the instrument to a place with a high temperature

✘ Please do not install the instrument to a place near open flame.



(Any breach of the above notes may cause damage to the instrument.)

Precautions

1. . . Operation23



Warning:

- Please insert the plug completely into the socket, or else a fire or electric shock may occur.
- Please keep power cable away from heat source, or else the cable cover will melt and a fire or electric shock may occur.
- Do hold the attaching plug when you unplug it, or else the power cable may be injured and result in electric leakage. A fire or electric shock may occur.
- ⊗ Please do not carry on the following operations, or else a fire or electric shock may occur.
 - ▲ Disassemble or remodel the instrument.
 - ▲ Damage or remodel power cable.
 - ▲ Use power supply with the voltage range unspecified in this handbook.
 - ▲ Place heavy objects on power cable
 - ▲ Drag forcibly or over bend the power cable
 - ▲ Insert or pull out plug with wet hands.
 - ▲ Bundle up or knot power cable.
 - ▲ Use other power cable other than the one provided with the instrument.



Note:

- To assure a steady power supply, this instrument must be configured with AC purified regulated power.
- Please do not pile up objects around the attaching plug. It is easy to pull it out in case there is an emergency.
- If smoke, overheat, off flavor or abnormal noise is detected, please turn off mains switch, disconnect the attaching plug and stop using the instrument immediately.

Precautions

1. . . Application group31



Note:

Operator of this instrument should know some basic knowledge about computer. They must be trained or instructed by our professional technicians. The instrument forbids children or pregnant women to approach and operate.

1. . . Ambient environment32



Warning:

To avoid unexpected failures, the computer should work under the following specified environmental conditions.:

Contents	Applied range	Note
Storage and transport temperature	15°C ~25°C	
Relative storage and transport humidity	≤70%	
Air pressure	86kPa ~106 kPa	
Power adaptive capacity	220V±5V, 50Hz±60Hz	
Ambient humidity	≤70%	
Ambient temperature	15°C ~30°C	

Product Overview

2. Introduction

Product Name:

Drawell X-ray fluorescence Non-halogen Analyzer

Mode: EDX3600H

Weight: 65Kg

Sample chamber dimension: $\Phi 320\text{mm} \times 100\text{mm}$

Outer dimension: $650\text{mm} \times 510\text{mm} \times 350\text{mm}$

Application field: Non-halogen testing, full-element

testing, RoHS testing and plating testing



Configuration:

- X-ray tube of high efficiency for halogen testing
- Silicon Pin semi-conductor cooling 5100 detector
- Signal-Noise-Enhancer (SNE)
- Special accessories for halogen testing
- Optical path enhancement system
- High SNR electronic circuit unit
- In-built high resolution GCD
- Collimator and filter of auto switch
- Auto spectrum stabilizer
- Triple safety protection mode
- Independent matrix effect correction mode
- Multi-variable non-linear regression procedure
- Overall steel support structure
- 50mm X 70mm LCD

Instrument advantages:

- Made in USA, halogen testing, X-ray tube of high efficient; the specification reaches the International advanced level.
- Special accessories are developed for testing halogen element (especially chlorine element)
- Low energy X-rays are used, delivering good results when exciting light elements such as Cl, Br.
- Intelligent pumping vacuum system shield air influence and enlarge testing scope.
- Auto spectrum stabilizer ensures the instrument working.
- High SNR electronic circuit unit
- Auto collimator and filter switch, exempt from trouble by manual.
- Spectrum unfolding technology decomposes the spectrum peak; ensuring Cl, Br and other light elements testing have the equal analysis accuracy.
- Multiple linear regression, reducing the inter-elemental absorption and enhancement effect
- In-built GCD with high resolution
- LCD makes the important parameter (tube voltage, tube current, vacuum) of the instrument obvious.

Technical specification:

- Measurable elements: From Na to U
- Element contents: 1ppm—99.99%
- Simultaneously test 24 kinds of elements
- Plating thickness: up to 0.005um each layer; It is able to analyze plating with more than 11 layers.
- Analysis accuracy: 0.05%
- Testing time: 60s—200s
- Energy resolution: (135±5) eV
- Tube voltage: 5KV—50KV
- Tube current: 50uA—1000uA

Product Overview

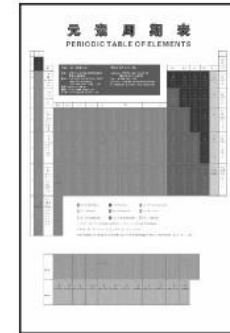
2. Unpacking and checking

When you unpack the instrument, you would see the following articles: instrument, standard samples case, wall charts and accessory bag.

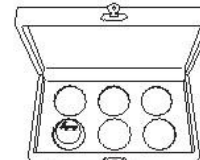
wall charts (I)



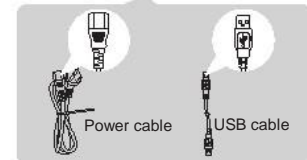
wall charts (II)



standard samples case



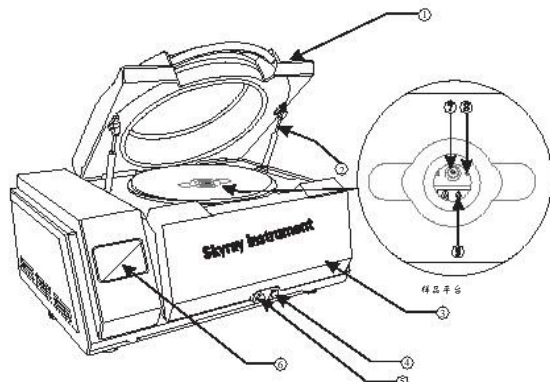
accessory bag



Power cable

USB cable

Product overview



① Upper cover

② Front board

③ Power indication light

④ Detector

(The test window of this instrument is made of beryllium metal film with frail physical property, so it is easy to be damaged under external force. Any consequence caused by operation in this window will be deemed as manual damage, and Drawell Company will not be responsible for it.)

⑤ Collimator

⑥ Air support

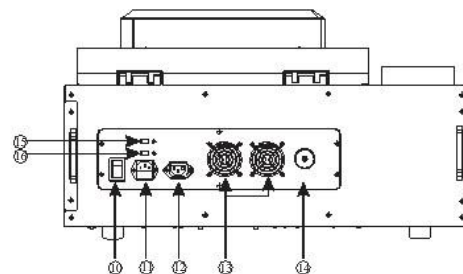
⑦ Radiation indication light

⑧ LCD

⑨ Surface light source

(easy to observe samples)

Product overview



⑩ Power switch
(turn on the instrument)

⑪ Fan
(Radiating function)

⑫ USB port
(link CCD)

⑬ Power socket

⑭ Vacuum pumping interface
(linked with vacuum pump; improve testing accuracy)

⑮ USB port
(link computer)

⑯ Powersocket

Installing the instrument

This chapter gives an overview of the precautions concerned with the installation places and the instrument connection. You are suggested to read this chapter before applying the instrument.

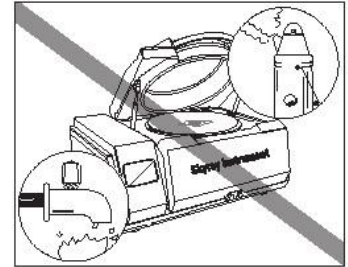
3. Installation precautions!
 1. The ambient requirement:
 1. The room must be equipped with air-conditioner, computer and printer.:
 2. There shouldn't be water source, heat source, strong electromagnetic interference, inflammable material or bulk dust in the room. The room should not be exposed to direct sunlight either.

Installing the instrument

3. . Avoid installing the instrument to the following environments.12

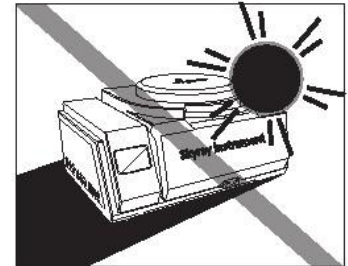
- An environment with rigid high or low temperature.

Avoid installing the instrument near a tap, water-heater, humidifier or any place in low temperature. If the ambient temperature is too low, then when the instrument get warm (rising to normal temperature), humidified vapor will be formed inside, which will damage the circuit board. The raindrop, humidified vapor or liquid usually contain minerals that erode the precision parts of the instrument.



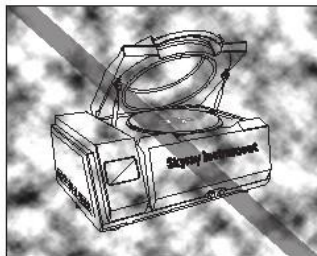
- High temperature environment

High temperature will shorten the lifespan of the electron devices and damage the battery.



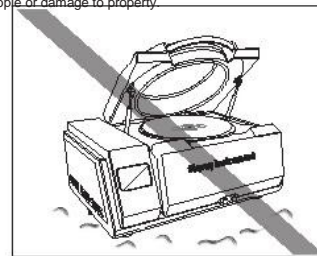
● Bulk dust environment

Dust may pollute the light path system of the instrument and lead to inaccurate measurement results or inability of measuring.



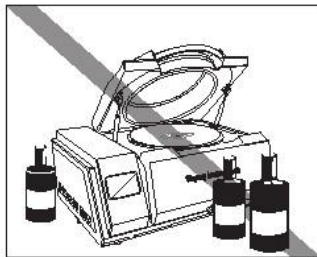
● Place vulnerable to vibration

Avoid installing the instrument on unstable desks or brackets. Nor soft surfaces or other places uneven or vulnerable to vibration. Otherwise, the instrument may fall or turn over, which may cause harm to people or damage to property.



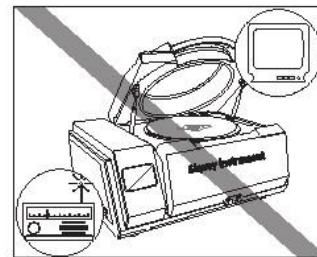
● Near volatile or flammable material

Please do not install the instrument near ethanol, paint thinner or other flammable materials. When the flammable materials contact with the electronic parts inside the instrument, a fire or electric shock may occur.



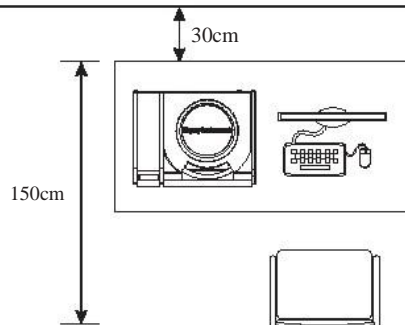
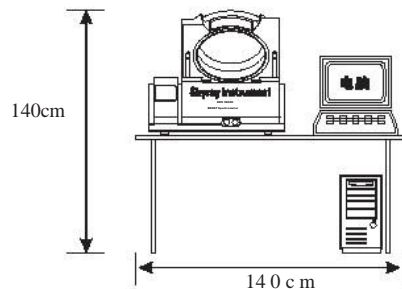
● Strong electromagnetic interference

Avoid installing the instrument near TV set, high-voltage cable, high-power antenna, electric welding devices, radio or electronic equipments like this.



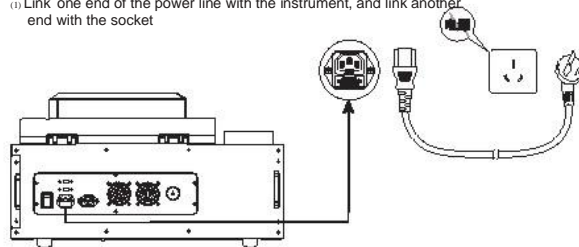
- Ample space must be provided.

Ample space should be set aside for this instrument. The distance from the sides of the instrument to wall, door or other objects in the room should be over 30 cm. This benefits the operation of the instrument.

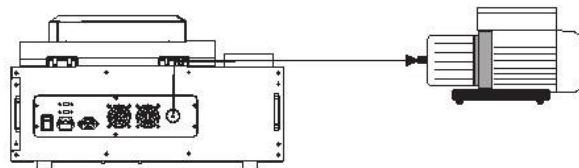


Installing the instrument

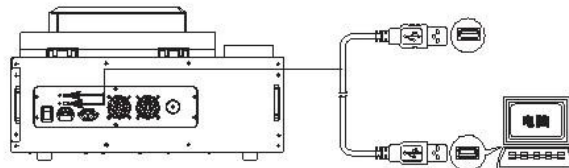
- Link one end of the power line with the instrument, and link another end with the socket



- Link pipe with vacuum pump

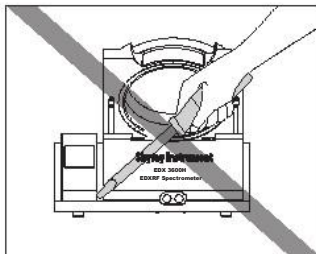


- USB extension line is used for linking the instrument and computer. Then the CCD line and the instrument controlling line

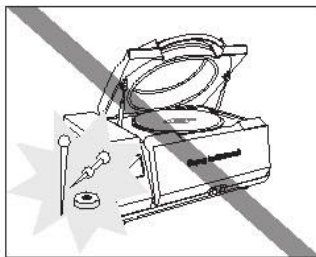


Operating the instrument

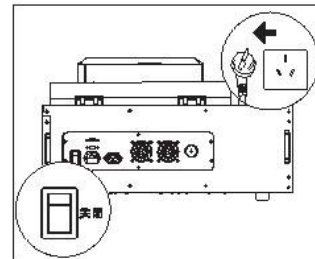
- Do not try to disassemble or remold this instrument. Any actions taken by laypeople may damage the instrument.



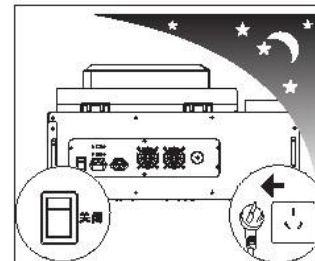
- Don't splash liquid on or let other objects fall into the instrument. When alien objects contact with the electronic parts inside the instrument, it may cause short circuit and lead to a fire or electric shock.



- If the instrument gives off smoke or makes unusual noises, turn off the mains supply as soon as possible and pull out the plug from the socket. Call the local authorized Drawell agent. Under this circumstance, to go on using the instrument will lead to a fire or electric shock. Meanwhile, avoid piling up things around the power supply. Ensure the plug can be pulled out at any time.



- For security reason, the instrument should be disconnected with power supply when it is not used for period of time (e.g. at night). Furthermore, the instrument should be covered with dust-proof cover and seated in a dry, ventilated place as additional safety measures.

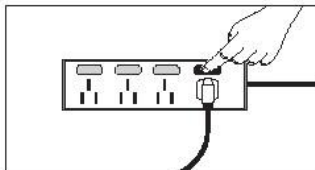


Operating the instrument

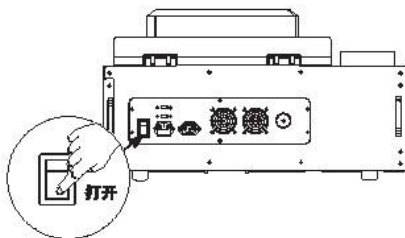
4. . How to turn the machine on:21

First check power, computer and the link between the instruments; turn on the power after checking if it is the right link between them. The right operation to turn on the power is as bellowing:

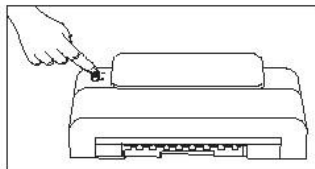
Turn on the main power1、



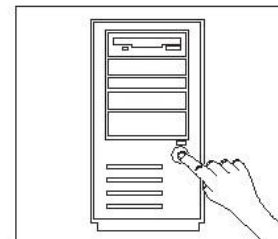
Turn on the power of XRF Analyzer2、



Turn3、 on the power of printer

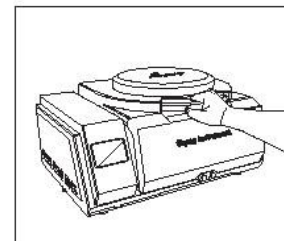


Turn4、 on the power of main computer

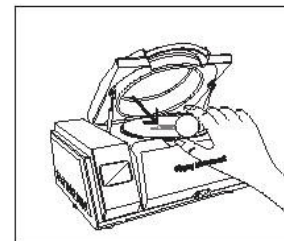


4. . How to put in and take out the sample22

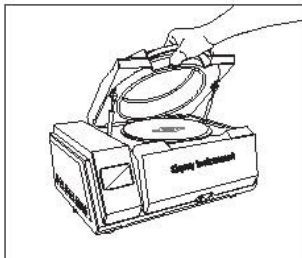
Push up the instrument cover to open the sample chamber1、



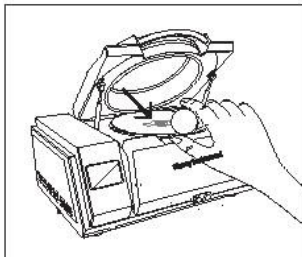
Put2、 the sample in the testing window



Pull down the instrument cover to close the sample chamber³.



Repeat the above procedures to take out the tested samples⁴.



Repair and Maintenance

Drawwell instruments are products of good design and fine workmanship. They are precious high-tech instruments which are highly sophisticated. They must be handled carefully and maintained properly. The following suggestions may help you to follow the warranty terms and prolong its service life.

Suggestions:

1. The instrument should be used and watched by a specifically-assigned man. Without permission, anyone else should not touch, operate or move it.
2. The machine must be configured with AC purified regulated supply to assure a stable power supply.
3. Do not try to disassemble the instrument. Actions done by laypeople may damage the machine.
4. Be particularly careful in moving the instrument. It is easy to damage the internal devices or spoil the appearance of the instrument once stumbled.
5. In process of detection, the instrument must be protected from interferences such as electric motor, vibration, electric welding, electromagnetism and high voltage.
6. Keep the machine dry. And mineral substances in rainwater, humidity and other liquids may corrupt its precise parts.
7. Do not use or store the machine in dusty or dirty environments. The dust may pollute its light path system and lead to inaccurate measurement results.
8. Do not use or store the machine in a too hot place because high temperature shortens the life of electronic parts and destroys batteries.
9. Do not store the machine in a too cold place. Or else when the temperature of the machine rises (to normal temperature), humidity appears inside it and destroys PCB.
10. Do not wash or clean the machine with strong chemical reagents or strong detergents. Clean the dust with a soft cloth. Wipe the stains with alcohol cotton ball gently.
11. Put dustproof cover on the machine and keep it in a dry and ventilated place when it is not used.
12. Attend to the following usage notes:

Repair and Maintenance

- When turning on the power of the instrument, be slow in your actions. A great force may destroy the buttons.
- Be careful to prevent sample particles from dropping into sample chamber and polluting X-ray tube and detector window when you put sample into it, or else it may result in inaccurate measurement and probe damage. In addition, handle with care (better with tools such as tweezers) to avoid damaging the window membrane.
- Use alcohol cotton balls to clean sample cover.
- The machine needs to be warmed up for 30 minutes before it goes to normal testing operation after start-up.
- Different programs should be selected in the program column for different types of samples so as to obtain best testing results.
- Examine parameters periodically and make adjustments to assure its long-term normality.

Notes:

Please contact your supplier in time when the machine or its components do not work.

Common hardware failures and their solutions.

6.1 Common hardware failures and their solutions.

6.1.1 High voltage indicator light is off during detection.

Normally, the high voltage indicator will be ON during the detection. If the light is off, the possible reasons are as follows:

1.The power of the instrument does not turned on.

When the power of the instrument is not started, it can not enter the working status. And the high voltage indicator light is hence off.

Solution: turning the power on.

2.The high voltage goes wrong.

There are some improper operations on the instrument. For example, if the voltage is set too high and it brims over its capacity, the high voltage is apt to get destroyed. After we exclude other factors for causing this problem, we should think over this reason that the high voltage may be destroyed. (When the high voltage goes wrong, a creaking sound may be heard at the same time.)

Solution: Contact the nearest Drawell office or its authorized service center and change the high voltage.

6.1.2 Other hardware failures.

When the instrument goes wrong at work, and can not regain normality after different remedies, it is probable that some hardware fail. At that time, the users are strongly recommended not to take apart the instrument for inside checking. It will damage the inner parts and pose a threat to the users' security. If the users insist on checking the internal structure, they must cut off all power supplies.

Solution: Contact the nearest Drawell office or its authorized service centre.

6.2 Printer problems and their solutions

To print the detection report, there must be a printer that connects to the computer. If the printer can not be connected to or work normally, the possible reasons are:

Printer problems and their solutions

1.No port is left for the printer after the connection of the instrument.

There are only two parallel ports on the computer, one for the monitor and the other for the spectrometer. If the printer also uses parallel port, it can not be connected to the computer then.

Solution: Change the printer into one with USB interface.

2.The printer does not work even after proper connection.

Possible reasons:

- The printer is not started
- The USB port on the computer fails.
- The data cable goes wrong.
- No printer driver is installed

Solution: First, make sure the power of the printer is switched on. Then check whether the printer driver has been installed. If not, install the driver. In case these two causes are excluded, check the data cable to see whether it has been damaged. If it is damaged, change it. If the data cable works well, it is possible that USB interface on the computer goes wrong. Contact the nearest Drawell office or its authorized service center. Repair or change the USB interface.

Warranty Statement

Limited warranty:

If EDX series products or their authentic spare parts (hereafter "the product") are turned out to have defects in material or workmanship, Chongqing Drawell Instrument Co., Ltd.(hereafter Drawell) will warrant for free maintenance as long as they meet the following terms or premises:

- 1.EDX series products and their inner parts are warranted for 12 months after the date of purchase.
- 2.Limited warranty extends only to original customers (hereafter customer) who purchased products from Drawell and does not cover products purchased from resellers or obtained in other legal or illegal ways.
- 3.Limited warranty only applies to customers in countries or regions that listed in this document. It is only effective in countries or regions where Drawell intends to market their products
- 4.During limited warranty period, Drawell or its authorized service network may adopt new or re-made parts to repair or replace any defective products or parts according to Drawell's choice, and then return the workable products back to customers. Customers are not charged for expenses on parts or manual work involved in repair or replacement of the products. All parts, PCBs or devices that have been replaced belong to Drawell. Out shells and decorative parts that are approved by the customer before delivery are not included in these warranty terms.
- 5.The repaired products are still guaranteed during the remaining warranty period.
- 6.Customers are asked to provide purchase receipts or other purchase proof information of date and place as required by Drawell or its authorized service centers.
- 7.Customers shall burden fees occurred in transportation, shipment and treatment when the products are sent to and returned from Drawell or its authorized service centers.
- 8.Customers will have no rights to enjoy limited warranty in any case as follows:

Warranty Statement

8.1.The products have suffered: abnormal use, improper storage, exposure to humid environment, exposure to too hot, too cold or similar environment, unauthorized change, unauthorized connection, unauthorized repairing (included but not limited to the use of unauthorized spare parts) misuse, negligence, abuse, accident, alteration, incorrect installation, force majeure, food or liquid splash, faulty customer operation or other conducts exceeding reasonable controls of Drawell, such as lack of wear-off parts (such as membrane), breakage and damage of power cable (unless it is directly related to the lack of material or workmanship) and normal wear and tear of the product.

8.2.Drawell has not received any notice of fault or breakdown from customers during limited warranty period.

8.3.Serial number of the product or date codes of accessories are removed, damaged or altered.

8.4.The product is not provided by Drawell, or connected to or used with the accessories unsuitable for Drawell product or for other purposes.

9.If error occurs in warranty period, customer shall take the following steps:

9.1.Customer shall return the product to the place where customer purchased it to repair or replace it.

9.2.If it is not convenient to act as A, customer shall contact local Drawell office to get the address of nearest authorized service center.

9.3.Customer shall arrange the transportation of the product to this authorized service center and related fees are not included in the limited warranty terms.

9.4.Customer will receive the bill of all parts and manual work excluded in limited warranty terms. And customer shall pay for reinstallation of the product.

9.5.If the product is returned to Drawell after warranty period, Drawell will adopt its general service policy and charge customer for related fees.

Warranty Statement

10.Any implicit warranty terms about commerciality or applicability for certain special purpose or use are limited to above warranty period. Otherwise the warranty discussed above is the only compensation for purchaser, and it substitutes for all other explicit or implicit warranty. Drawell will not take legal responsibility for occasional or subsequent damage or anticipated loss in interest or profit and work interruption or data loss or damage caused by use or inability to use the product.

11.The interests provided in limited warranty terms are supplements to all the other rights and compensations regulated in laws of the countries or regions.

12.Drawell neither burdens nor authorizes its authorized service center or individual or entity to burden any obligations not provided definitely in the limited warranty terms.

13.All warranty information, product functions and specifications are subject to the change without notice.