Copyright

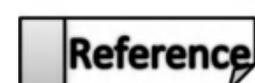| Document name	INSIZE Dial ISQ-DB50 User Manual
Model	ISQ-DB50
Scope	Introduction of the operation and maintenance of INSIZE Dial ISQ-DB50 for user reference.

Introduction

This manual describes the software functions of INSIZE Dial ISQ-DB50, and provides the instruction in assembly, transport and maintenance of the instrument and the precaution information in use.

Please read this manual carefully before use in order to make the best use of the instrument.

You can preserve this manual for future reference.

Conventions Used in the Manual

The symbols below are used for important information.

⚠ Danger	**Indicates the failure to follow the instruction will result in personal injury or death.**
⚠ Warning	**Indicates the failure to follow the instruction may result in personal injury or death.**
⚠ Caution	**Indicates the failure to follow the instruction may result in personal minor or moderate injuries.**
Notice	**Indicates the failure to follow the instruction will result in damage to the product or property damage.**
▶Important	Indicates the rules and restrictions you must comply with during operation.
＼ Point	Indicates the information you need to pay attention to for a better use.
Reference	Indicates the keys for a better use and understanding of related information.
	Indicates the page number in this manual or other document.

Notice

❖ The information contained herein is subject to change without notice.

❖ If you find any problem in this manual, such as unclear description, omission of content and errors etc., please contact our after sales.

❖ If there is missing page or binding error in this manual, we will provide you with a new one.

INSIZE Dial ISQ-DB50 software license agreement

We will provide INSIZE Dial ISQ-DB50 ISQ-DB50software on condition that you agree and accept the terms below.

Please read these terms below carefully before using the software.

By using the software, you agree the statement herein and accept this agreement.

License terms

User notice: please read this software license agreement ("Agreement") carefully. By using the whole or part of the INSIZE Dial ISQ-DB50 software ("Software"), you agree to be bound by the terms and conditions of this Agreement. If you do not agree the terms and conditions of this Agreement, do not use the Software.

1. Definitions

1.1 "Use" or "using" means the access, installation, download, copying of the functions of the Software or the action of getting benefits from the Software.

1.2 The Software means the software and the related documents provided by INSIZE.

2. Grant

Upon the compliance of all terms and conditions of this Agreement, INSIZE.("INSIZE") grants the user a nonexclusive, nonassignable and nontransferable right and license to install and use the Software on a computer. The user may make one copy of the Software only for backup or archival purpose.

3. Restrictions

3.1 The user shall not copy the whole or part of the Software for any other purposes except for backup.

3.2 The user shall not sell, distribute or upload the whole or part of the Software.

3.3 The user shall not adapt, alter, amend, modify, reverse engineer, decompile, disassemble or decode the whole or any part of the Software.

3.4 The user shall not rent out, rent or share the whole or part of the Software.

3.5 The user shall not directly or indirectly export the whole or part of the Software without authorization by related government.

4. INSIZE owns all rights of the Software.

5. INSIZE grants the user the license of the Software according to the "status quo" and does not provide any form of guarantee. INSIZE and its distributors are not responsible for the damages, compensations, charges or any other profits loss caused by using the Software by the user under any conditions.

6. Termination

6.1 The user rights under this Agreement will terminate automatically if the user keeps any copy of the Software after destroying the Software or return the Software to INSIZE.

6.2 The user rights under this Agreement will terminate automatically without notice from INSIZE if the user fails to comply with any term(s) or restriction(s) of this Agreement. . Upon the termination of the Agreement, the user shall cease all use of the Software and destroy all copies, full or partial, of the Software.

6.3 The user shall pay INSIZE for the cost and profit loss caused by the user failure to comply with any term(s) or restriction(s) of this Agreement.

7. Applicable law

This Agreement is governed by the laws of the People's Republic of China. If any provision of this Agreement is found to be invalid or unenforceable, the remainder of this Agreement shall continue in full force and effect.

Operation precautions

INSIZE Dial ISQ-DB50 series are precision measuring instrument, please follow the precautions below when using this product to reduce the risk of injury and damage.

Precautions

⚠ Warning	✦ **Do not use this product to protect human body.** ✦ **Do not use this product as explosion-proof product. Do not use this product in dangerous place and/or explosive environment.**

⚠ Caution	✦ **Prevent foreign materials from entering into the machine to reduce the risk of short circuit, electric shock, failure or accident.** ✦ **DO NOT disassemble the product cover, or electric shock may occur when touching the inside machine** **Please make sure the instrument and the electronic control unit are well grounded, avoiding short circuit, electric shock and other dangerous accident.**

Notice	✦ **Please note that we cannot guarantee the functionality and performance of the products that have been modified or are beyond the specifications.** ✦ **The product may not be able to function properly depending on the operation conditions and the environment when it is used with the instruments from other company. Please make a full assessment before using.** ✦ **Please avoid strong vibration and impact, particularly for the glass-scale and spindle, the impact may affect the measurement accuracy or cause damage.** ✦ **Do not twist the screws that are not allowed to be disassembled on the instrument; otherwise it may result in damage to the instrument or influence on the measurement accuracy.** ✦ **Before unplugging/plugging in the power cable, controller cable and serial port cable, make sure the product is powered off to avoid breakdown.** ✦ **Do not place the items useless for measurement on the machine, avoiding damage.**

<table>
<tr>
<td></td>
<td>

✦ **Do not cut the instrument off or unplug the serial port cable during measurement. Otherwise, the measurement will be stopped and some or all data will be lost.**

✦ **The instrument must be powered off when connecting the serial cable to the computer.**

✦ **Immediately stop the measurement and move the spindle back if it exceeds its measuring range and alarm sound alerts, so as to avoid causing damage to the instrument. The instrument can automatically monitor the position of the spindle.**

</td>
</tr>
</table>

▶Important

✦ Environment requirements:

Temperature: (20±2) ℃
Humidity: 50%-70%

✦ Situate the instrument system and measurement object in the same environment for a half hour or longer before measurement when the instrument is powered on.

✦ Do not start other software during the running of INSIZE Dial ISQ-DB50 software.

✦ Hand wheel is only for transmission, if you found it retardant after a long-term use, check whether the sliding surface of guideway is contaminated.

✦ Regularly clean the metal working surface of guideway and spindle (with gasoline or ethanol cotton) and oil the guideway of holder with anti-rust oil. If the instrument will not be in use for a long time, please pack and store it in a dry environment.

✦ Make sure the instrument is well grounded, so as to enhance anti-interference ability and ensure safety. All plugs used in electronic control box are standard plugs.

✦ Rigidly fix the dial gauge on the holder during the measurement.

For semi-automatic measurement, the sampling is continued following the completion of sampling at current point. The sampling at each point must be operated properly.

✦

➤ INSIZE Dial ISQ-DB50 software works with INSIZE Dial ISQ-DB50 instrument, therefore, it is necessary to input the correct information and perform the operation in accordance with the operation rules and the related regulations.

➤ Power off the instrument when not in use.

Safety information

Please disconnect power supply under the following circumstances. Use in an improper situation may result in fire, electric shock or accident. Please contact our after sales for maintenance.

Water or foreign body enters into the machine.

The instrument is hit or falls or its housing is damaged.

The instrument smokes or smells.

Notice	**Backup all data in database before send the machine for maintenance, in case of data loss. It is advisable to back up the data at regular times.**

Installation instructions

Warning	❖ **Connect the ground protection outlet on power cable to the ground protective conductor at the installation place to reduce the risk of electric shock and product damage.**

Caution	❖ **Place the machine horizontally. Fix all components in case they may fall and be damaged and injure the operators and the people nearby.**
	❖ **Do not bend the cable by strong force or place heavy stuff on it. Otherwise, the cable may be broken and catch fire or results electric shock. Do not use damaged cables.**
	❖ **Make sure the instrument is operated in proper voltage to reduce the risk of electric shock, fire and breakdown.**

Notice	**Do not install the machine in the following places, which may result in breakdown or reduction in measuring accuracy.**
	❖ **Places with strong vibration.**
	❖ **Places where the temperature and humidity changes greatly.**
	❖ **Places where the direct airflow of air conditioner goes through.**
	❖ **Places with plenty of dust, fumes, salt, and iron.**
	❖ **Places with heavy air moisture, gasoline or chemicals dripping.**
	❖ **Places with strong magnetic field or electric field.**
	❖ **Places with great voltage variation.**
	❖ **Places covered by sunlight.**

▶Important   ➡ It is recommended that the instrument is installed on an anti-vibration frame.

Transport instructions

Caution	❖ **Please power off the instrument and unplug the power supply cable and serial port cable if you want to transport the machine, or otherwise it may result in damage to the instrument or personal injuries to the operator as the cables may drop.**

Notice	✦ **ISQ-DB50products are precision instruments, protect it from vibration and strike to reduce the risk of damage.** ✦ **ISQ-DB50products are precision instruments, a sudden change in temperature may cause inaccurate measurement. Situate the instrument in a room with a temperature of 20±2 °C for 2 hours in a laboratory environment after unpacking.**

▶Important   ✦ Before transporting, pack the instruments and holders etc. in the packaging box provided and ensure they are placed in a stable position.

                  ✦ Transport the instrument system carefully, trying to avoid strong vibration.

Storage instructions

Notice	**Cover the instrument with dust cover if it will not be in use for a long time.**
	
	Avoid storage in the places below:
	
	✦ **Places where the instrument bears direct vibration.**
	
	   Places with a temperature of less than 0℃ or more than +30℃.
	
	✦
	
	   Places with a RH of less than 35% RH or more than 70% (without condensation).
	
	✦ **Places with quick change of temperature.**
	
	   Places filled with corrosive gas or volatile flammable materials.
	
	✦ **Places with plenty of dust, salt, iron and fumes.**
	
	✦ **Places with exposed water, gasoline or chemicals dripping.**
	
	✦ **Places with strong magnetic field or electric field.**
	
	✦ **Places where the machine may be exposed to direct sunlight, wind and**
	✦ **rain.**
	
	✦ **Places where the machine is unstable and has the risk of falling.**
	
	✦

Additional information

Notice	When the instrument cover is dirty, clean it with clean cloth.

Manual framework

This manual includes four parts: product introduction, the installation of hardware and software, introduction of functions and application examples, troubleshooting and after-sales service.

Product introduction

This part provides the information about the working principles, features and technical specification.

Chapter 1	Product introduction	The information about the working principles, technical specification, applicable scope, operating environment and installation procedure.

Installation of hardware and software

This part contains all the information necessary for installing the hardware and software.

Chapter 2	Installation	Description of the installation of hardware and software.

Functions and operation examples

This part provides the introduction of the software interface and the operation examples.

Chapter 3	Hardware introduction	Description of product panel, basic operation of button box and measurement and measurement procedure.
Chapter 4	Software interface	Description of the software user interface and its basic functions.
Chapter 5	Operation examples	Description of operation examples.

Maintenance and software upgrade

This part provides the information about troubleshooting and after sales services.

Chapter 6	Troubleshooting	Description of common faults or malfunctions and appropriate corrective actions.
Chapter 7	Software upgrade and technical support	Contact information about the software upgrade and technical support services

Contents

Chapter 1   Product introduction

1.1 General

INSIZE Dial ISQ-DB50

INSIZE Dial ISQ-DB50 adopt imported high precision glass-scale measuring system, precise glass-scale displacement measurement and control technology, patented long-life precision guideway, imported motor control system, patented non-reflective light source, high resolution CCD, colour liquid crystal display system and touch system and up-to-date digital image processing technology, which achieved the full automatic and high precision measurement of dial indicators.

The measurement adopts artificial intelligence approach. The operator just needs to install the dial indicator and selects the related parameters such as indicator type, graduation and measuring range in software and then clicks the "Start" button, the instrument will immediately drive the indicator and perform measurement according to the standard. After measurement, you can print the measurement report (including data table, error curves of plunger outward movement and plunger inward movement and the judgement of indication errors). The measurement speed is more than two times as fast as other full automatic indicator measurement instruments in China.

The instrument uses the computer to automatically control motor for accurate driving the glass-scale without manual rotating the hand wheel or microdrum.

1. The measurement software can automatically capture data without manual sampling;
2. The CCD unit can simulate the human eyes to read the dial and automatically recognize.
3. The measurement operation not only increases the measuring efficiency but also free the user from labour and mental work.
4. The automatic focusing camera system offers an easy and simple operation without detailed and complicated adjustment by hand.

1.2 Structure and principle

Structure

The whole instrument system consists of glass-scale system, image processing system, electronic control unit, holder, measurement software, computer and printer. The structure schematic is shown in figure 1-1.
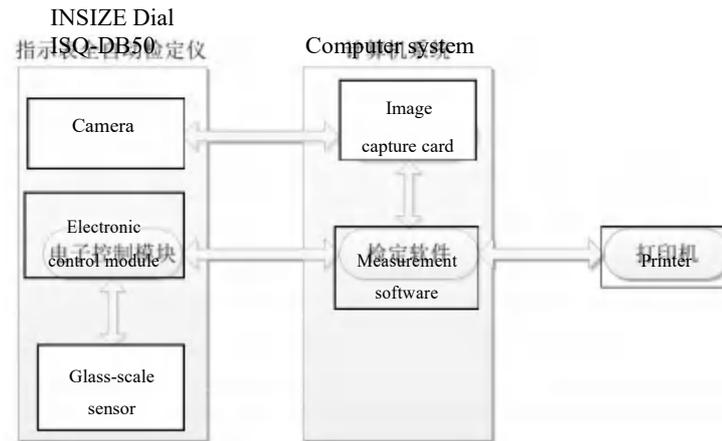
Figure 1-1 Structure schematic

Working principle

➤ As the user clicks "Start" in user interface of the software, the computer will send corresponding control instructions to the microprocessor in measurement and control box according to the information input by user, such as the type of dial indicator, graduation and measuring range.

➤ After receiving the instructions, the servo motor drives the glass-scale and the instrument probe which will drive the plunger of dial gauge under measurement to reach each measurement point, and then transmit the displacement information of the glass-scale to the computer.

➤ The computer gets dial images via the camera and then automatically identifies the dial readings by digital image processing technology. By comparing the readings with the displacement of glass-scale, the error of each measurement point is obtained.

➤ After the measurement on every point, the measurement record will be generated and the conclusions will be made, which will save to the database. The user can view and print the error data tables and curves and the measurement results as well. Working principle schematic of INSIZE Dial ISQ-DB50 series:
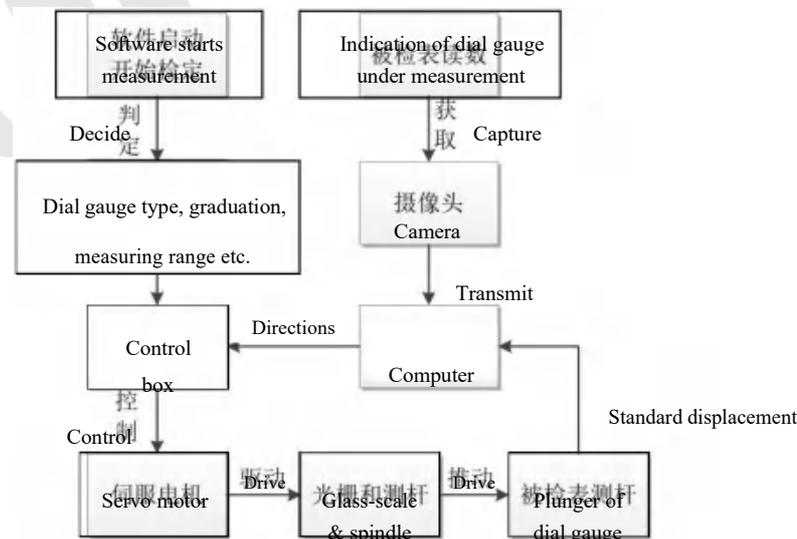
Figure 1-2 Working principle schematic

1.3 Product features

Product features	
Smart recognition	The measurement adopts artificial intelligence approach. The operator just needs to install the dial indicator and selects the related parameters such as the indicator type in software and then clicks the "Start" button, the instrument will immediately perform full automatic measurement according to the corresponding standard. After measurement, the software will automatically calculate errors and save the measurement results, user can print the measurement report including error data table or curves.
Easy-to-use	The dial indicator can be easily installed on the instrument. With user-friendly user interface on instrument and software, it is easy and convenient to set the parameters and perform the measurement. For a new user, it just takes a minute to master the operation.
Multi-function	Completely cover all functions of semi-automatic products of in dial gauge test field on the current market。
Up-to-date standard	Strictly follow the national standards and comply with the latest national metrological standards. If the standard is updated, the software can be updated in time.
High accuracy	Less than 1.0 μm in 50 mm travel.
Reliability	Good measurement repeatability.
Powerful printing function	The measurement reports are regular but beautiful in format and layout, and the error data tables or curves can be printed in batches.
Support output of Word file	The measurement data in records can be exported to Word file for backup and convenient data management. The editable templates of measurement report and measurement certificate in Word file can be redesigned according to user requirements,

1.4 Application scope

Applicable standards

INSIZE Dial ISQ-DB50 are designed for the first article inspection of various indicators and the

follow-up inspection as well as the test during use. The instrument system contains the following national verification regulations and national standards: "JJG 34-2008 Dial gauges (dial and digital)", "GB/T 18761-2007 Dial indicator with electronic digital display", "JJG 35-2006 Dial Test Indicator" "JJG 1102-2003 Calibration Specification for Bore Dial Indicators", "JJG 379-2009 Wide range gauges reading in 0.01 mm", "JJG 39-2004 Comparator of machine type" and "JJG 118-1996 Micro-Kator".

Types of dial indicator

Classification according to verification regulation:

Verification regulation	Applicable indicators and measuring range
JJG 34-2008 Dial gauges (dial and digital)	Dial gauge with graduation of 0.01 mm or 0.002 mm, measuring range of 10 mm or less; dial gauge with graduation of 0.001 mm, measuring range of 5 mm or less. Digital indicator with resolution of 0.01 mm, 0.005 mm or 0.001 mm, measuring range of 10 mm or less.
GB/T 18761-2007 Dial indicator with electronic digital display	Digital indicator with resolution of 1 mm or 0.005 mm, measuring range of 50 mm or less. Digital indicator with resolution 0.001 mm, measuring range 30 mm or less.
JJG 35-2006 Dial test indicator	Dial test indicator with analogue indication or with electronic digital display with graduation/resolution of 0.01 mm and measuring range of 1 mm or less and those with graduation/ resolution of 0.001 mm or 0.002 mm and measuring range of 0.4 mm or less.
JJG 1102-2003 Calibration specification for bore dial indicators	Bore dial indicator with graduation of 0.01 mm or 0.001 mm, measuring range over 2 mm up to 10 mm.
JJG 379-2009 Wide range gauges reading in 0.01mm	Wide-range dial & digital indicator with graduation of 0.01 mm and measuring range of over 10 mm up to 50 mm.
Inch-type dial gauge	Graduation of 0.0001 inch or 0.0005 inch, measuring range of 0.5 inch or less; Graduation of 0.001 inch, measuring range of 2 inch or less.
JJG 39-2004	Comparator of machine type with graduation of 1 μm, 2 μm, 5 μm or

Comparator of machine type	10 µm.
JJG 118-1996 Microcator	Microcator with graduation of 1 µm, 2 µm, 5 µm or 10 µm.

Measurement scope of INSIZE Dial ISQ-DB50

 The measurement scope:
Fully automatically test dial indicator with graduation of 0.01 mm or 0.001 mm, dial test indicator, bore dial indicator and wide-range dial indicator with graduation of 0.01 mm and the digital form of above mentioned types and the inch-type dial indicator; Semi-automatically test   dial   and   the   dial   indicator   with   significant

Application fields

INSIZE Dial ISQ-DB50 ISQ-DB50are applicable to the metrological and quality inspection organizations and agencies and the quality control department of electronics field, automotive industry, aerospace industry, metallurgy industry, railway locomotives field, defence industry, engineering and machinery industry, nuclear power industry and optical industry etc.

Chapter 2   Installation

2.1 Hardware installation

Installation procedure

1. Check the accessories according to packing list.

2. Unpack the instrument and place it on the table carefully, avoid strong vibration.

3. Connect the camera with the tester and computer.

4. Connect the PC serial port on tester to computer. For the computer without serial port, you can use a USB converter.

5. Connect the instrument to power source and make sure the supply voltage is AC 220V±10V.

6. Connect printer.

7. Switch on the instrument and power on it.

8. Install the dial indicator to be measure according to the operation procedure in user manual and start measurement.

Notice	Do not take the right hand wheel as the force bearing point in transit. The instrument must be powered off when connecting the serial cable to the computer.

2.2 Software installation

The instrument is equipped with a software CD.

The software has been installed in the instrument before shipment, if necessary, you can install the software according to 2.2 Software installation.

2.2.1   Installation and configuration of camera driver

The installation of camera driver

Start the computer and click "Cancel" when the system indicates a new hardware is found. Insert the software CD into the CD drive tray, and run the "gigecam_setup.exe" in the file "Gigabit Ethernet camera drive". The installation procedure of camera driver:

Click "Next"

Click "仍然继续"
（equivalent to
"Continue"）

Hardware installation

Software being installed for this hardware

Failed to pass the Windows micro-standard test, unable to verify its compatibility with Windows XP

Continuing to install this software will destabilize the system immediately or in the future and it is recommended that you stop the installation

Continue

Stop

Click "Finish"
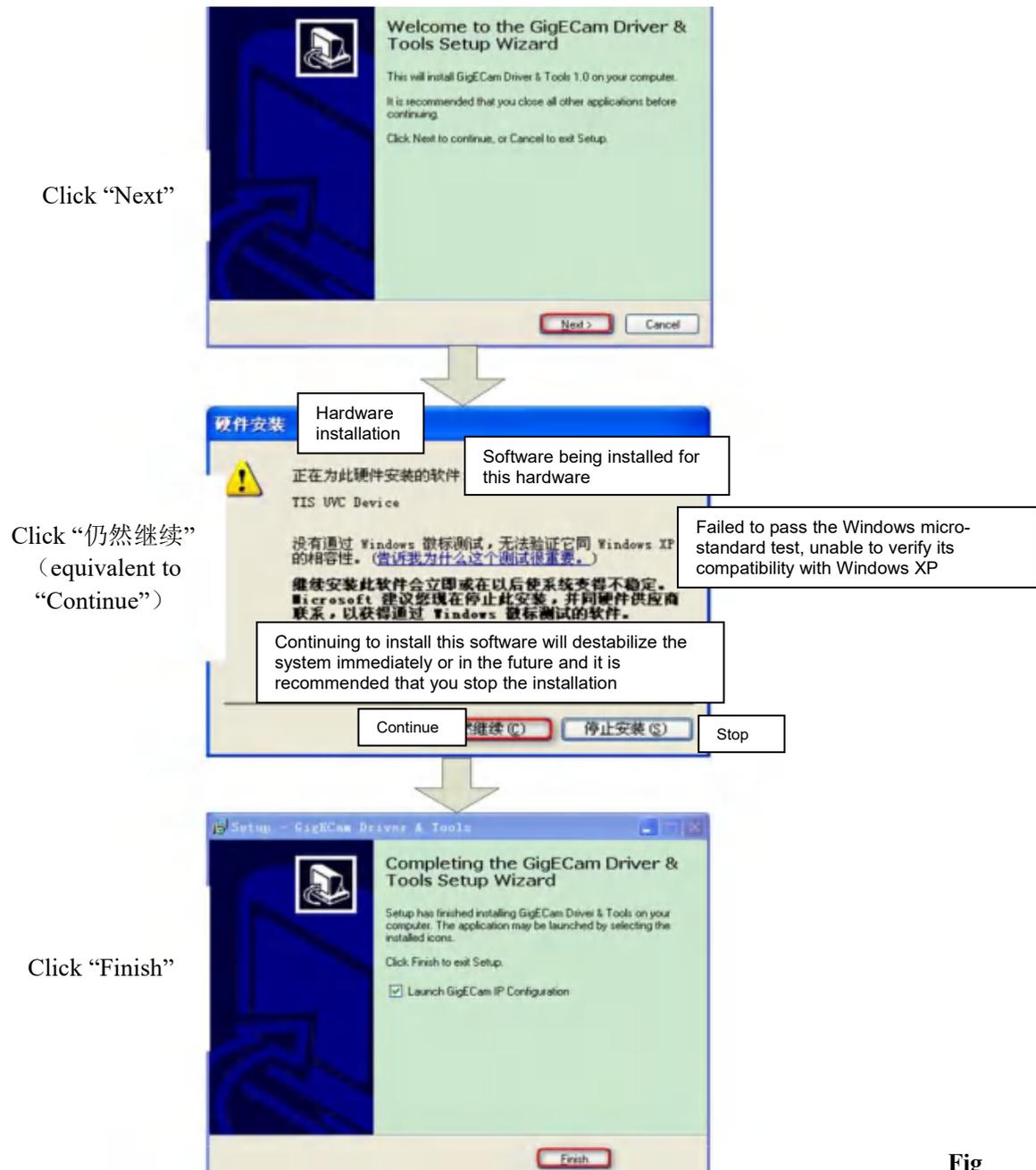
Figure 2-1 the installation procedure of camera driver

IP address configuration

Set the network ID in IP address of the camera and that of the computer to the same network segment, that is, the first three parts in IP address of both camera and PC are the same, the last part is different (for example, the IP address of camera is 192.168.1.2, and the IP address of PC is 192.168.1.3, then the camera and PC belong to the same network segment. The IP address of the camera is set to 192.168.2.102 before delivery.

Setting computer IP address

Operation steps: right-click the "Network" and select "Properties" → click "Local area connection" and

select "Properties" → double-click INTERNET protocol (TCP/IP) → select "Use the following IP address" and enter the IP address and the click "OK". See figure 2-2.

Figure 2-2 Set computer IP address

Setting camera IP address

The setup procedure of camera IP address:

Run the "GigECam IP Config" software
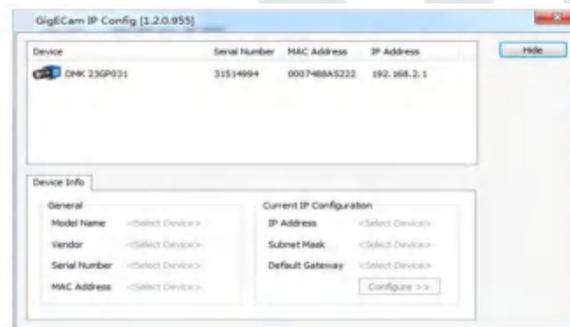
Select camera model and click the "IP Configuration" tab to type the IP address and then click the "Apply" button
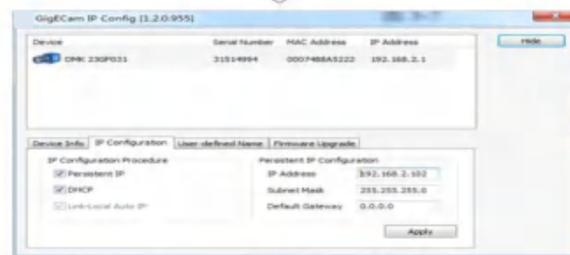
Setting completed
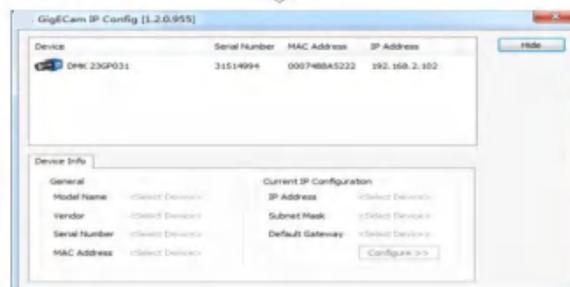
Figure 2-3 Set camera IP address

2.2.2   Installation of GrandDog driver

Installation of GrandDog driver

Before shipment, the instrument has been equipped with a GrandDog with set password, the user is able

to use the software by simply plugging the matched GrandDog into the computer.

▶Important	Before staring the software, please insert the GrandDog into the computer, or otherwise, the software is unable to use. Please keep the GrandDog properly, if you lost it, contact the manufacturer.

Insert the software CD into the CD drive tray, and install the software

"GrandDogRunTimeSystemSetup.exe". The installation procedure is shown in figure 2-4.

Run "GrandDog deriver"

↓

Select installation language

↓

Click "Next"

↓

The installer has completed the installation on the computer

↓

Click "Finish"
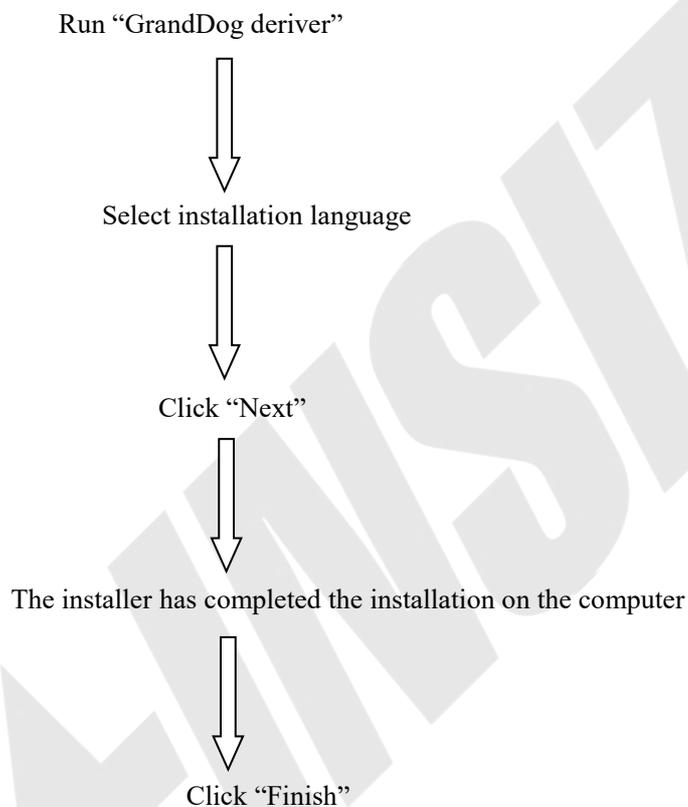
Figure 2-4 Installation procedure of GrandDog

2.2.3   Installation of printer driver

The instrument applies HP series laser printer. You can install the driver according to the prompted information after inserting the CD provided with the printer.

2.2.4   Measurement software installation

Software installation

INSIZE Dial ISQ-DB50 share the same installation procedure of measurement software

Insert software CD into the CD drive tray → double-click the icon "INSIZE Dial ISQ-DB50 software V6.2.exe" in the CD files → click "Next", and select the installation location in the "Select installation directory" box, if you want to use the default installation directory "D:\Program Files\INSIZE Dial ISQ-DB50 software V6.2, directly click "Next" → click "Next" → click "Close" to complete the installation. See figure 2-5.
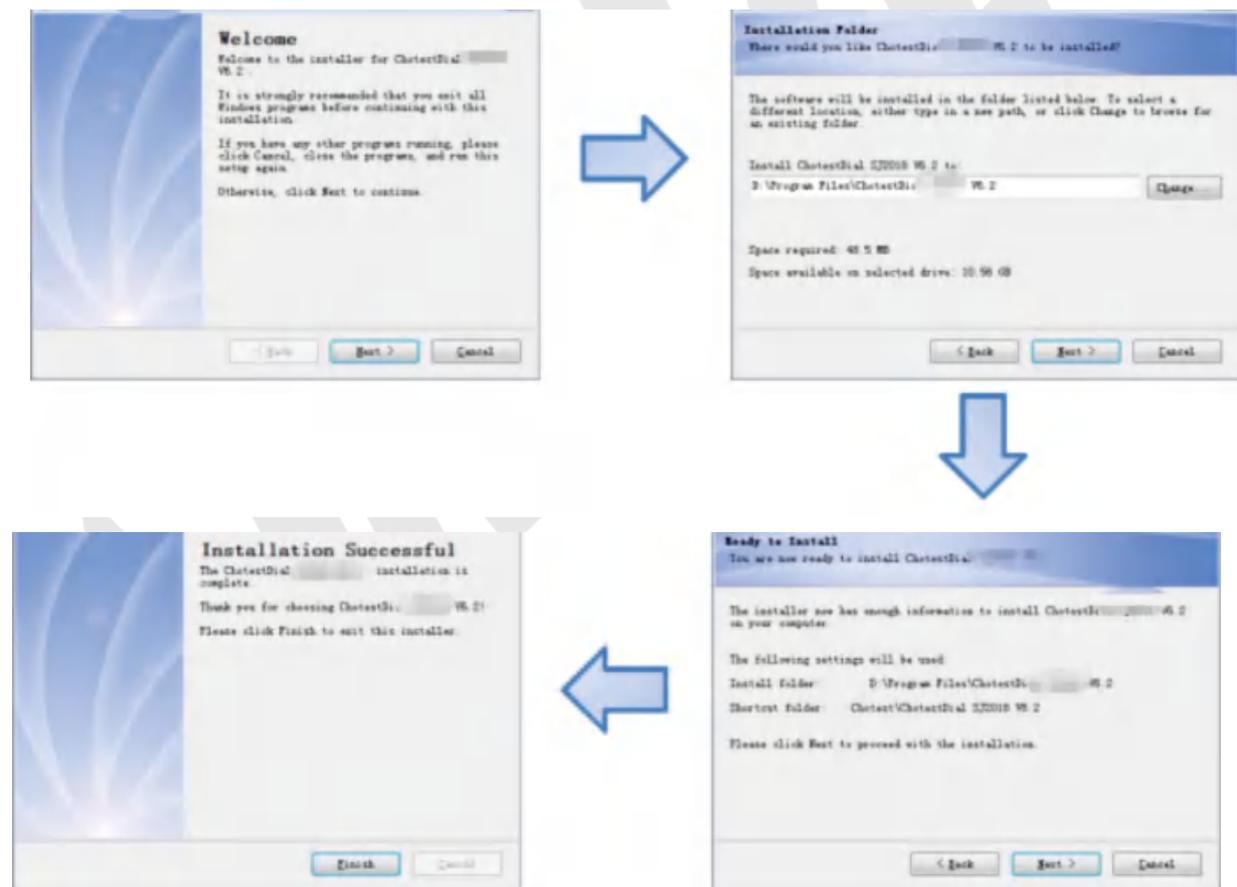
Figure 2-5 Software installation procedure

By installing the software, the shortcut icon "INSIZE Dial ISQ-DB50 software V6.2" will be automatically

created on the desktop.

After the installation, the software will automatically run the "Microsoft Visual C++ 2005

Redistributable Package", as shown in Figure 2-6, click "Yes" to install the software.
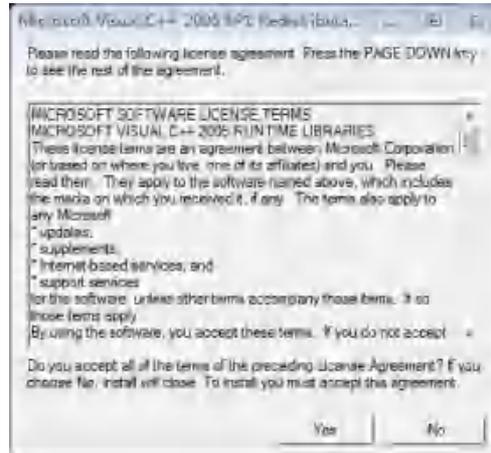
Figure 2-6 Microsoft Visual C++ 2005 Redistributable Package

	For the computers that installed the measurement software for the first time, the software may not function properly if the Microsoft Visual C++ 2005 Redistributable package is not installed.

Chapter 3   Hardware

3.1 Panels and button box

Tester states

Depending on the operation procedures, the instrument can be in fully automatic state, semi-automatic state and manual state.

➤ Fully automatic state: the initial state when the machine finished the self- test after powered on. When the instrument is in the "manual" state, the instrument can be switched to fully automatic state by pressing the "Auto / Manual" key on the button box or long pressing the "Manual" button on the instrument panel.

➤ Semi-automatic state: the sate when you clicked "Start" button after selecting the measurement method of "Semi-automatic" in software.

➤ Manual state: the instrument sate can be switched to "manual state" by pressing the "Auto/Manual" key in "fully automatic" state.

Touch panel

The touch panel of INSIZE Dial ISQ-DB50 ISQ-DB50display indication, unit and current mode. Under the panel, there are keys of "Manual/automatic", "Zero", "Fast forward", "Fast backward", "Slow forward"," Slow backward "," >> " etc.

By pressing ">>", "Sampling", "Reset", "Language" and "System" etc. buttons will appear.

Button functions

The buttons on the touch panel have different functions in different modes, i.e. fully automatic state, semi-automatic state and manual state.

The function of buttons in different states:

Button	Fully automatic state	Semi-automatic state	Manual state
Auto/Manual	Switch to "manual" state	/	Switch to "fully automatic" state
Zero	Zero	Zero	Zero
Fast forward	Quickly extend the spindle.	/	/

Slow forward	Slowly extend the spindle.	/	/
Fast backward	Quickly retract the spindle.	/	/
Slow backward	Slowly retract the spindle.	/	/
Sampling	/	Capture data	/
Reset	Reset the system and set the probe to the position of zero.		
Language	Switch system language between Chinese and English		
System	Set the speed of slow and fast extension and retraction and the data calibration.		

Rear panel

The panel on the rear of the instrument mainly includes: power switch, power input interface, RS232 interface and video signal output interface. They are mainly use for power supply and communication, for the connection operation, refer to the hardware installation operation described in this manual,

Button box

Functions of button box

The function of each key on button box:

Key	Fully automatic state	Semi-automatic state	Manual state
Fast forward/sampling	Quickly extend the spindle.	Capture data	Not applicable
Slow forward/zero	Slowly extend the spindle.	Zero	Zero
Fast backward	Quickly retract the spindle.	Not applicable	Not applicable
Slow backward	Slowly retract the spindle.	Not applicable	Not applicable

The button box makes it easy for users to perform semi-automatic measurement and manual operations. There are five function keys on button box, i.e.

(equivalent to 'fast forward/sampling')", (equivalent to 'slow forward/zero')", (equivalent to 'fast backward')", (equivalent to 'slow backward')" and (equivalent to 'Auto/Manual') ".

Auto/Manual	Switch to the manual state	Not applicable	Switch to the fully automatic state

3.2 Basic measurement procedure

Measurement procedure

All measurements are basically performed in the flowing operation steps. See figure 3-1.

```
┌─────────────────────────────────────┐
│  Switch on INSIZE Dial ISQ-DB50      │
│  and start the software              │
└─────────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────────┐          No
│  Install the dial gauge to be        │ ─────────────┐
│  measured and adjust the captured    │              │
│  image                               │              │
└─────────────────────────────────────┘              │
          │  Yes                                      │
          ▼                                           │
┌─────────────────────────────────────┐              │
│  Click "Input" to set the            │              │
│  corresponding information           │              │
│  according to the dial gauge         │              │
└─────────────────────────────────────┘              │
          │                                           │
          ▼                                           │
┌─────────────────────────────────────┐              │
│  Click "Start" to start the          │ ◀────────────┘
│  measurement and perform the         │
│  operation according to the guidance │
└─────────────────────────────────────┘
          │
          ▼
┌─────────────────────────────────────┐
│  Measurement completed, view         │
│  record and print report             │
└─────────────────────────────────────┘
```
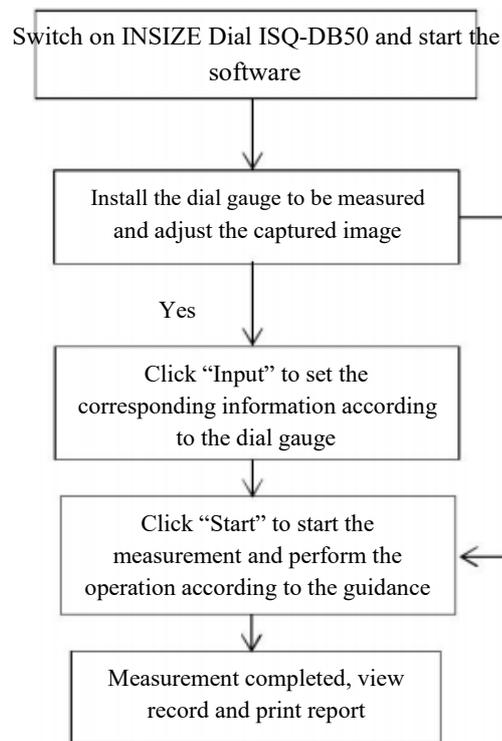
Figure 3-1 Measurement flowchart

Reference

INSIZE Dial ISQ-DB50 ISQ-DB50instruments are qualified by taking Outgoing Quality Control inspection complying with national inspection regulation before shipment. INSIZE Dial ISQ-DB50 ISQ-DB50instruments are in line with the second level, you can perform the inspection by yourself if you have the equipment, or send to production units or local metrological department.

Chapter 4　　Software interface

Starting software

Power on the computer, and then double-click the "INSIZE Dial ISQ-DB50 V6.2" icon, a logon window will appear, you can select the username and password to log on. The logon window is shown in figure 4-1.

Figure 4-1 Logon window

If you just installed the software for the first time, no password is required for the user "Admin", you can directly click "OK" to log on.

Software main interface

The main interface of software:
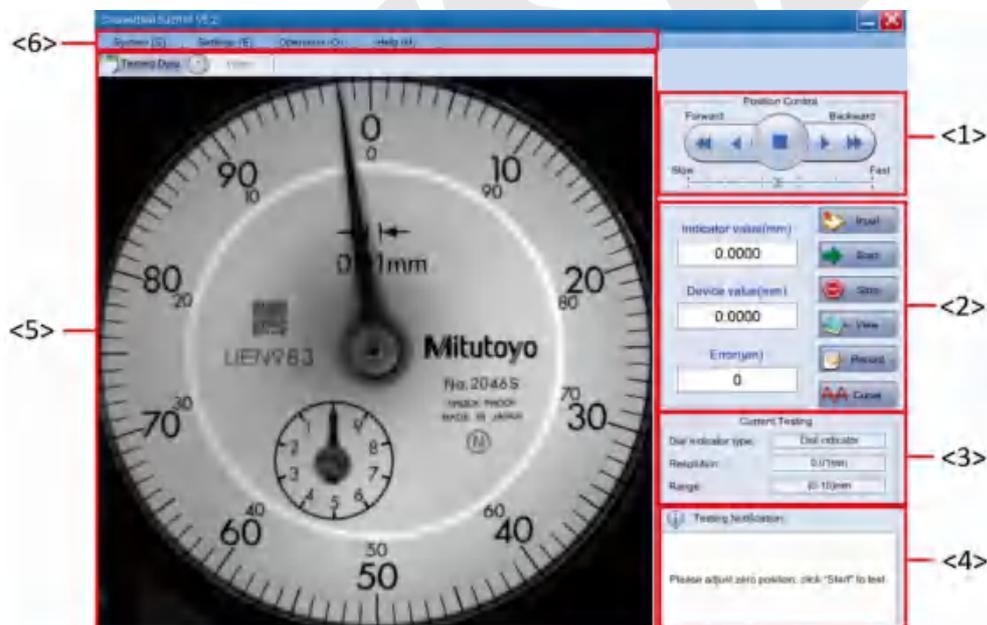
Figure 4-2 Software main interface

<1> Position control Control the movement speed of the spindle. **<2> Measurement control** Input: to input the basic information of the dial indicator to be measured before measurement. Start: start the measurement on the dial indicator according to the verification regulation. Stop: stop the measurement in the process of measurement. View record: view the error data, measurement conclusion, error curve and the input information of the last measurement. Record management: view the measurement records. Show curve: display the measured error curve in real time. Displayed measured values: glass-scale indication of tester, indicator reading, error value. **<3> Current measurement** Display the information about the type of the indicator under test, graduation, measurement range, measurement type.	**<4> Status information window** Provide the information about the state that the software is in currently and operation guidance you should follow for next step. **<5> Image and data window** Image: display the picture of the indicator under measurement, Measurement data: show the measurement point, error data and error curve. **<6> Menu bar** System: used to exit the software. Settings: contain "report settings", "measurement settings" and "print settings" and their submenus. Operation: contain "pause measurement", "show/hide recognized scale" and "adjust image" and their submenus. Help: check the version number of the software and license information etc. **Position control** Via the buttons "◄◄", "◄", "►", and "►►", control the fast or slow extension or retraction at a speed of 0-3 mm/s.

Measurement control

 : **set the measurement information about the indicator to be measured before measurement. See figure 4-3.**

Figure 4-3 Information input window

<1> Gauge type Select the corresponding information about the indicator to be measured. **<2>Inspection Solution** Add: add the customized inspection solution. 	Modify: modify the customized inspection solution. Delete: delete the customized inspection solution.
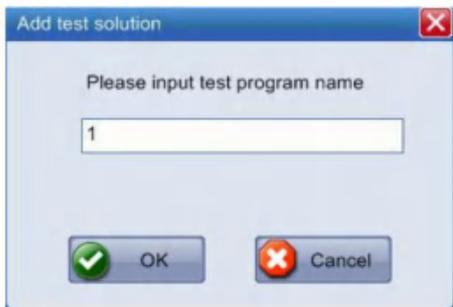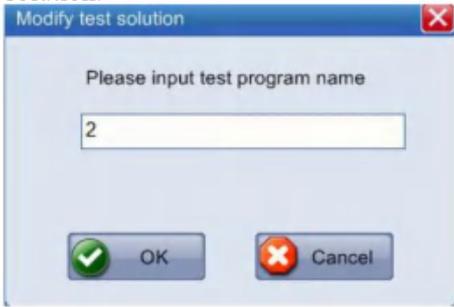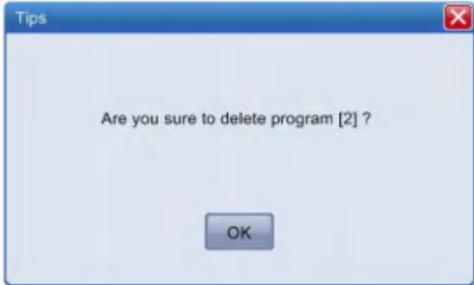
\ Point   In customized program, the information about dial indicator such as "measurement range" "graduation", and "number of scales" etc. are automatically filled in according to the information input in measurement settings in the window "input measurement information"(see figure 4-3).

<3> Measurement setting Set the resolution, range, measurement type of the dial indicator to be measured. Resolution: the value of the scale interval. Range: the measuring range of the dial indicator to be measured. Scale lines: set the number of the scale marks. Inspection Mode: select one measurement method form fully automatic and semi-automatic measurement according to your needs. Repeatability: selecting the box will verify repeatability User defined: check this item and then select the button "Verification Setting", the user can change these items, such as"work range","error item", "repeatability" and "additional test" **<4> Information and measurement items**	
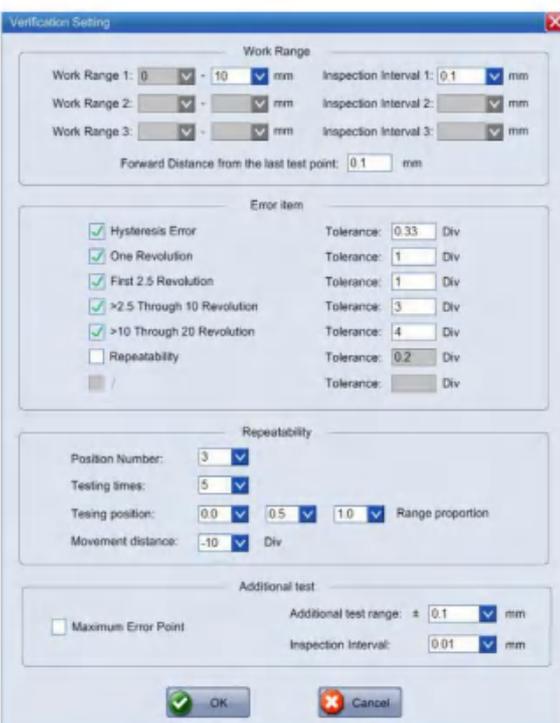
You can view the set information via "input information" in record management interface and measurement report in Word file.	Material standard settings: set the information about the material information.

\ Point

Modify the information about the dial indicator: modify the information in the corresponding box and then click "Save".

Modify data: select the "Measurement data" button, then double-click the data in the table you want to modify, then modify the data and click "Calculate", by which the software will re-calculate all error data and the measurement conclusion and display them in the table in the "Measurement data" window, and then click "Save".

By clicking "Modify display items", you can select the error items and confirm your operation by clicking "Confirm display items" If a measurement point exceeds the permissible error range, the data will be highlighted in corresponding colour; for a point which exceeds two or more permissible error range, the data can only be highlighted in one colour.
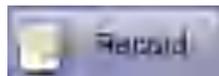
Record : **View, export, delete, report settings, print and backup**
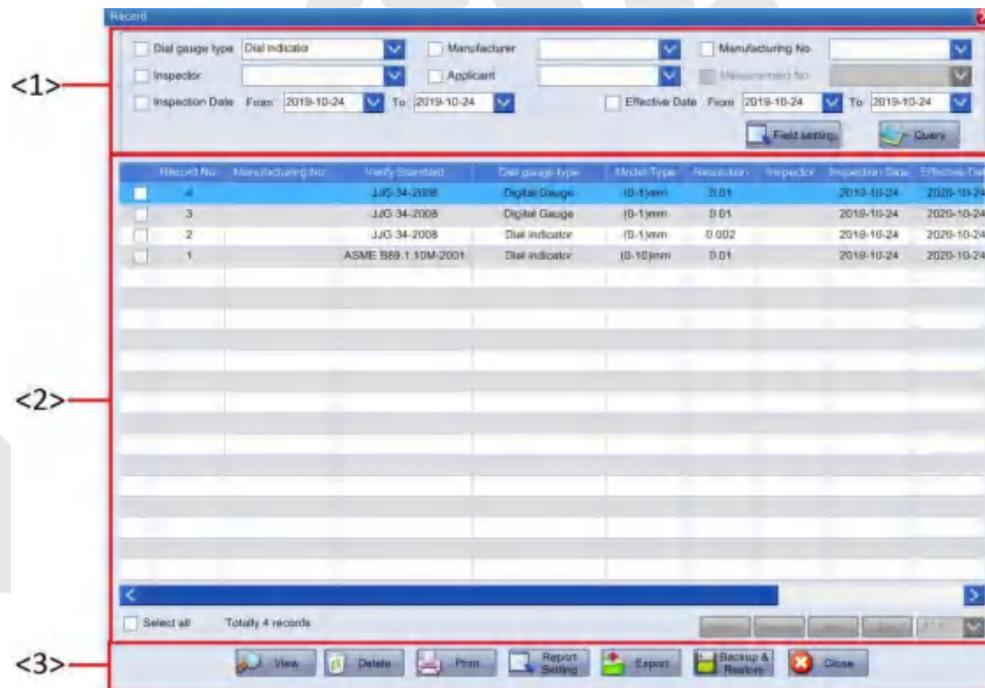
Figure 4-4 Record management

<1> Search	View: view the selected record. Preview report: open the set report of the selected record.
By selecting the check box(es) and entering the content, you can search for the records matching the search criteria by clicking "Search" and the matched results will be presented.	Set search items: you can add and delete the search items in record management window vis the two direction buttons and change the order of the added items by dragging.
<2> Measurement record list	

Present the measurement records in list.

<3> Measurement record operation area

Delete: delete the selected record(s) or the record(s) within the entered record No.

Export: export the selected record(s) or the record(s) within the entered record No. to Word file or the files in other format.

Backup & Restore: back up and restore the data in the database.
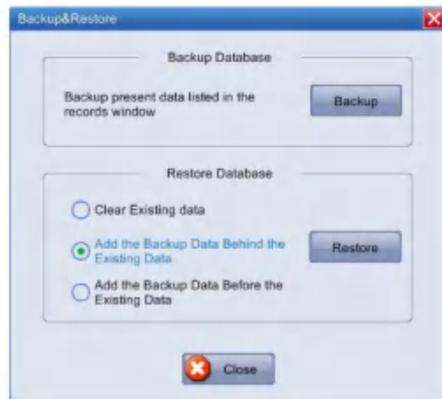
Close: close record management window

Report settings: set the template and format of the report.

Point The "Report settings" here is used to uniformly set the default mode for report preview, print and export in different formats.

Print: print the selected record(s).
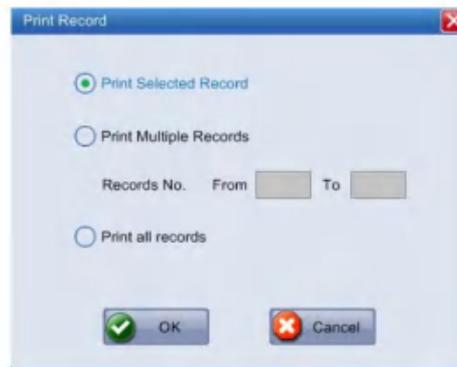
Setting report

Report settings: test record, test certificate and test result are available.

The test record contains the information of the measured dial gauge, measured data, the calculation results of indication error and the conclusion of the measurement. "Data sheet" are available in word

and excel. See figures 4-5 and 4-6.

Figure 4-5 Word   **Figure 4-6 Excel**

The test certificate contains the key information of the measured dial gauge and the measurement conclusion. See figure 4-7.

Figure 4-7 Test certificate

"Test results" contains the information of the measured dial gauge,the curve and the measurement conclusion, with four records on one page. You can select multiple measurement records to print at a time. See figure 4-8.

Figure 4-8 Test result

Click "Report settings" → click "Edit" in the program, a window will appear as shown in figure 4-9.
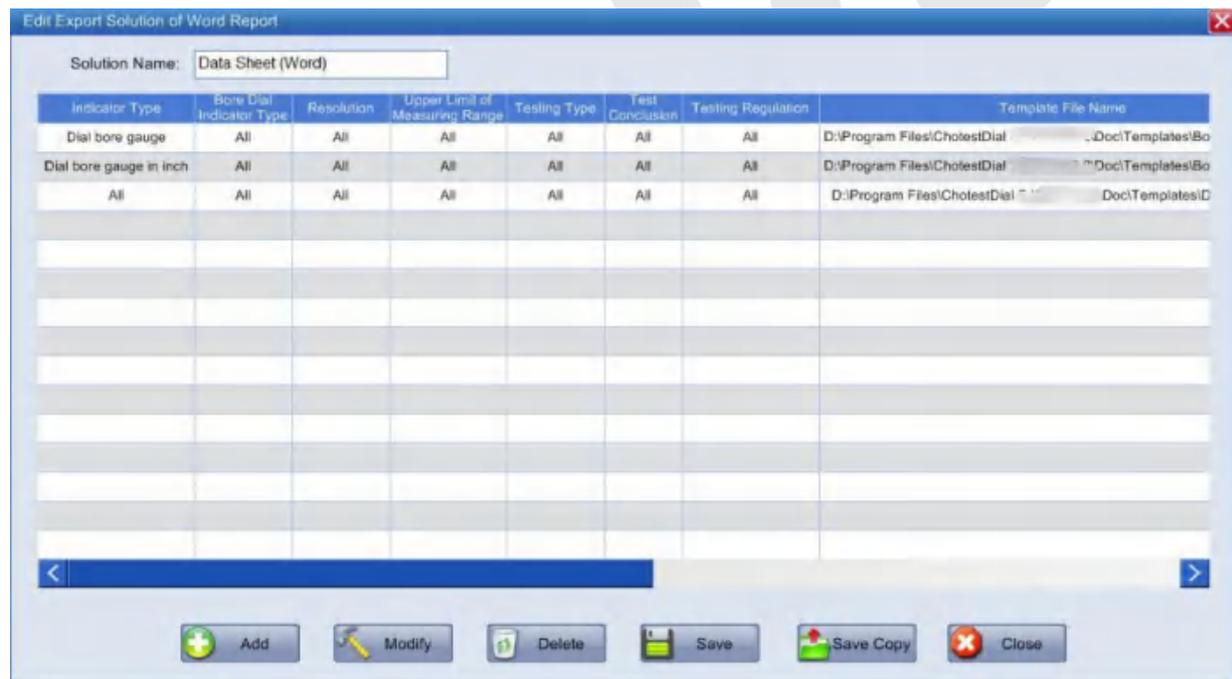
Figure 4-9 Edit Word report export program

Add: click this button when a record is selected, the "Add Word report" dialog box will appear. You can select the location for the files to be exported.

Figure 4-10 Word report export settings

\ Point

> The file name of the exported reports consists of three parts, the first and the third part can be set to any content,, while the second part can only be set as the "record number" or "factory number" or "Instrument number". Click "OK" after you set the template information.
>
> The file name set for the exported reports must comply with the file naming rules, no character not allowed by Windows should appear in the file name. If you select the "factory number" "instrument number" as the file name, it is wise to ensure their uniqueness.

Modify: by clicking "Modify" after selecting a report template, you can modify the original template settings according to your needs. The operation procedure is the same as the "Add" function.

Delete: delete the template you do not want it.

Save: make the modification to the template program effective.

Save as: save the program as a new one for future use after changing the name.

\ Point

> The "templates" are the default programs in software which have been set already. If necessary, you can rename the template program and select the suitable template according to your needs, and then click "Save" to save the program template. The changes in customized template program do not have effect on the template settings in the default program.

Examples of Word report setting

You need to divide the "Dial test indicator.doc" into the templates of "Dial test indicator with

graduation of 0.01mm.doc" and "Dial test indicator with graduation of 0.001mm.doc" The operation procedure is as follows:

Dividing template	Open the "Dial test indicator. doc" template: click "Record management" → "Report settings" → select "Word template" → the "Edit" option in "Measurement record" → select "Dial test indicator" record → "Modify" → Open the template; Add the specific information about the dial test indicator with graduation of 0.01 mm and save as "Dial test indicator with graduation of 0.01mm.doc". And then open the "Dial indicator.doc" again and add the specific information about the dial test indicator with graduation of 0.001 mm and save as "Dial test indicator with graduation of 0.001mm.doc".
Modifying "Dial test indicator with graduation of 0.01mm. doc"	Open the "Record management" window → click "Report settings" → select "Word template" → the "Edit" option in "Measurement record" → select "Dial test indicator" record → "Modify": set the value of graduation to 0.01 and set the measuring range and select the "Dial test indicator with graduation of 0.01mm.doc" in "Template file name" → click "OK" → click "Save".
Modifying "Dial test indicator with graduation of 0.001mm. doc"	Open the "Record management" window → click "Report settings" → select "Word template" → the "Edit" option in "Measurement record" → select "Add": set the value of graduation to 0.001 and set the measuring range and select the "Dial test indicator with graduation of 0.001mm.doc" in "Template file name" → click "OK" → click "Save". For other settings, refer to the template setting of dial test indicator.

Showing curves

Show curves: display the measured errors of each measurement point in real time, which will reflect the fluctuation of error data.
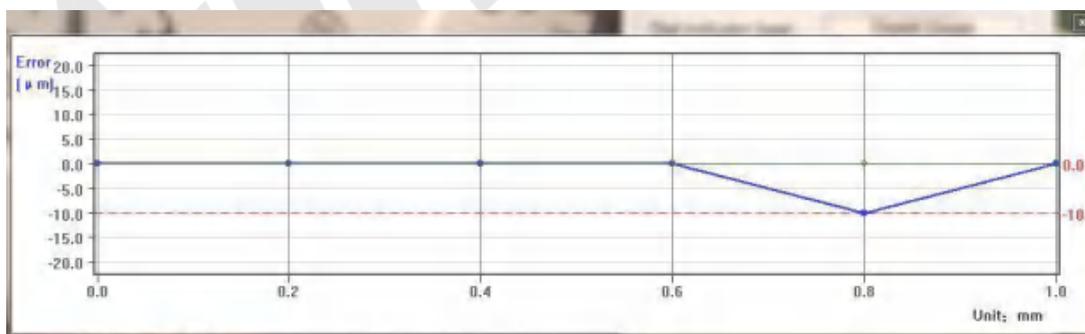

Figure 4-11 Error curves

Menu bar

Menu bar

Menu bar contains "System", "Settings", "Operation" and "Help".

The sub-menu "Exit" contained on the "System" menu is used to exit the software.

Print setting: set the printer and select paper size and printing direction.

Com setting: set the communication port which connects computer to instrument.

Figure 4-12 Com settings

Verification setting: set the delay time on measurement points, measurement speed and determine if the software notifies you when the measured value exceeds the permissible errors and whether to show curves as soon as the measurement is started.

Figures 4-13 Measurement settings

Delay time at testing point: the appropriate delay time can reduce errors in automatic measurement and obtain more stable image without sacrificing the measuring speed.

Testing speed: the measuring speed of comparator of machine type and microcator should be set separately.

Measurement parameter settings: in semi-automatic measurement, if you selected "Manual sampling", you must press the "Sampling" key by hand when the spindle reaches each measurement by rotating hand wheel; if you selected "Automatic sampling", the software will automatically take the glass-scale indication of the instrument according to the set "Sampling interval", and no manual pressing the "Sampling" key is required.

Show curves when measurement starts: the error curves will show in the main interface when the measurement is started, you do not need to click the "Show curves" button in the main window.

Notify when exceed permissible errors: a diglog box will appear when the measured error exceeds the permissible range during the measurement. You can click "Continue" to continue the measurement or click "Stop" to stop the measurement and the spindle will retract to the zero position.
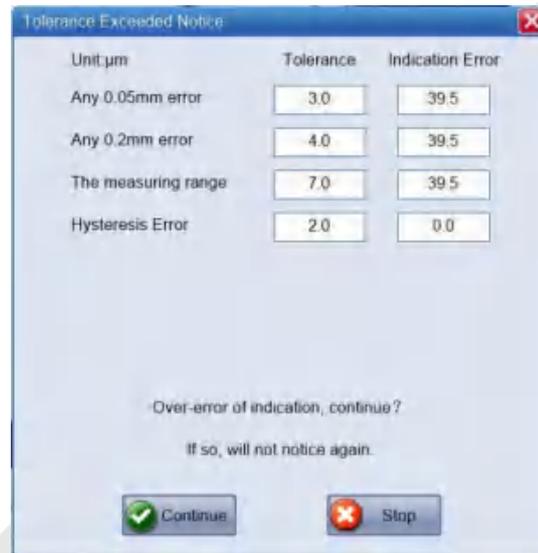
Figure 4-14 Notification of exceeding permissible error

User settings: add new user, delete an existing user, and modify user password.

Figure 4-15 User settings

Report settings (page 30).

Field content settings: set the drop-down box options applicable to the options accessed via the "Input" button. You can edit the contents of "Imspextor", "Verified by", "Manufacturer", "Inspection Address", "Applicant" and "Applicant Address".

Figure 4-16 Field content settings

Operation

Point pause: if this option is selected, a dialog box will appear after the measurement of each point, you can click "OK" to continue the measurement of next point.

Show/hide scale: by selecting "show recognized scales", the recognized scale marks of the dial gauge under measurement will be displayed by red lines in the image window, if you select "hide recognized scales", the virtual red lines will not be displayed.

Adjust video: rotate the captured image at a certain angle for a better observation during the measurement.

Open picture file: open the picture saved during verification.

Help

The "Help" menu includes "Measurement software", "Engineering license" and "Software version" which mainly provide the basic information about the software version number and license period.

Chapter 5   Operation examples

5.1 Adjustment before measurement

Installation of dial gauges

Installation of different dial gauges

	Installation procedure
Spindle position	Move the spindle to the appropriate position via the buttons "Fast forward" and "Slow backward" on the instrument panel or in the main interface of the software.
Dial gauge with graduation of 0.01 mm	Mount the dial gauge on the holder and make sure the dial in maintained horizontally, and then move the holder to the position where the measurement contact of the dial gauge just contacts the plunger of the instrument.
Dial test indicator	Mount the accessory on spindle of the instrument and install the dial test indicator on the holder; adjust the stylus lever axis of the dial test indicator to be perpendicular to its symmetrical plane; and then adjust the holder so that the stylus just is in the middle of the accessory and contacts its right side, which could ensure the spindle axis of the instrument is located in the rotary plane of the stylus lever.
Bore dial indicator	Mount the bore dial diameter on the holder; turn the camera from the vertical direction to the horizontal direction and move the camera so that the lens is focused on the indicator; and then move the holder so that the measurement head just contacts the spindle of the instrument.

After installation, set the spindle to an appropriate start position according to the measurement range of the dial gauge under measurement in order to avoid invalid measurement caused by the spindle's exceeding of the measuring range.

▶Important

If you are measuring the wide range (0 mm - 50 mm) dial gauge with graduation of 0.01 mm it is advisable to set the spindle of the instrument to the position close to the mechanical zero;

When you are using the accessory to measure the dial test indicator, the spindle should be at least 10 mm away from the mechanical zero.

Adjusting image

1. Image adjustment procedure of dial gauge:

➧ By inputting the measurement information and clicking "OK", the main window will be open again and a red circle and a centred cross will appear in the image.

➧ Adjust the knobs on the camera arm to make sure the camera is focused on the dial and adjust the brightness to make the image clear to see and make sure all dial scale line are inside the image

➧ There are two methods of adjusting the position of dial scales:

Adjust camera	Adjust the camera magnification or camera height while observing the displayed image in the main interface until the scale marks are entirely encircled by the red circle, see figure 5-1.
Adjust image	Move the mouse pointer to the edge of the red circle, by which the circle will become thick, and then press and hold the left mouse button and move the mouse to enlarge or reduce the circle: move the mouse pointer to the position near to the centred cross, by which the cross will become thick, and then press and hold the left mouse button and move the mouse to move the cross. By adjusting the size and position, the red circle can just encircles dial scale marks, see figure 5-2.

Comparing the two adjustment methods mentioned above, see picture in Figure 5-1 and Figure 5-2, it is clear that the image in figure 5-1 is clearer, consequently the image recognition accuracy will be higher during the measurement.
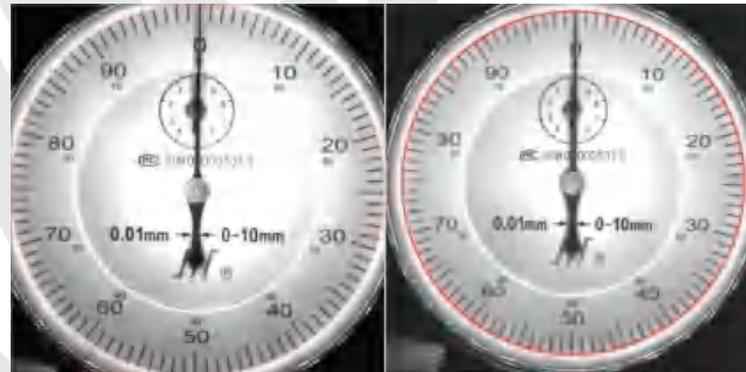
Figure 5-1 Adjusted manually   **Figure 5-2 Adjusted by software**

Reference

> By inputting the measurement information and clicking "OK", the main window will be open again and a red circle and a centred cross will appear in the image. You can adjust the red rectangle that surrounds the "0" position and the centred cross in the similar ways to the adjustment methods described above for figures 5-1 and 5-2.

➧ To align with the "0" in image if the red rectangle surrounds it: click the "Fast forward" button or the "Fast backward" button in the "position control" area to move the pointer to the left of the red

rectangle and the "0", which can make it easier for the software to automatically identify the "0" position at the beginning of the measurement.

To align with the "0" in image if no red rectangle surrounds it: press the "Fast forward" key or the "Fast backward" key to move the pointer to the "0" mark (by manual adjustment). Before clicking the "Start" button, you need to manually adjust the pointer to be aligned with the zero mark.

> **Reference**
>
> If the image has bright LED reflection spots, you can eliminate them by adjusting the lens hood and the height of the camera.
>
> The red circle should just encircle the scale marks on dial and the cross should be in the centre of the dial. If the cross is far away from the centre of the dial, which means that the camera is not vertical, you should re-adjust the camera, otherwise it may result in errors.

2. Image adjustment procedure of digital indicator:

Adjust the brightness to make the image clear and set the indication of the digital indicator to zero;

Input the measurement information in the software input and click the "OK" button to return to the main interface, and then drag the mouse to select the numbers of "0", see figure 5-3:

The software automatically recognizes the outline of the number "0" and then selects them, as shown in figure 5-4;

If the software missed a number, you can manually drag the mouse to select it.
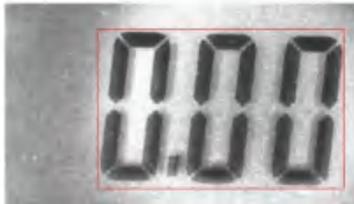
Figure 5-3 Manual selection	**Figure 5-4 Automatic recognition**

Separate the spindle of instrument from the measurement contact of the digital indicator by using the "Fast backward" button or key and then set the indication of digital indicator to zero.

Zero the digital indicator again when its indication is within 0.1 mm - 0.2 mm by using the "Slow forward" button or key.

Autofocus

Based on INSIZE Dial ISQ-DB50, the autofocus function is added to INSIZE Dial ISQ-DB50 software. If the dial gauge is just mounted on the holder, the image may not be clear enough, and you need to perform autofocus.

After logging on the software, the main interface will appear. You can set the values of

"Magnification" and "Focal length by clicking the "Focus" button. The dialog box contains the parameters set in the last time. . See figure 5-5.
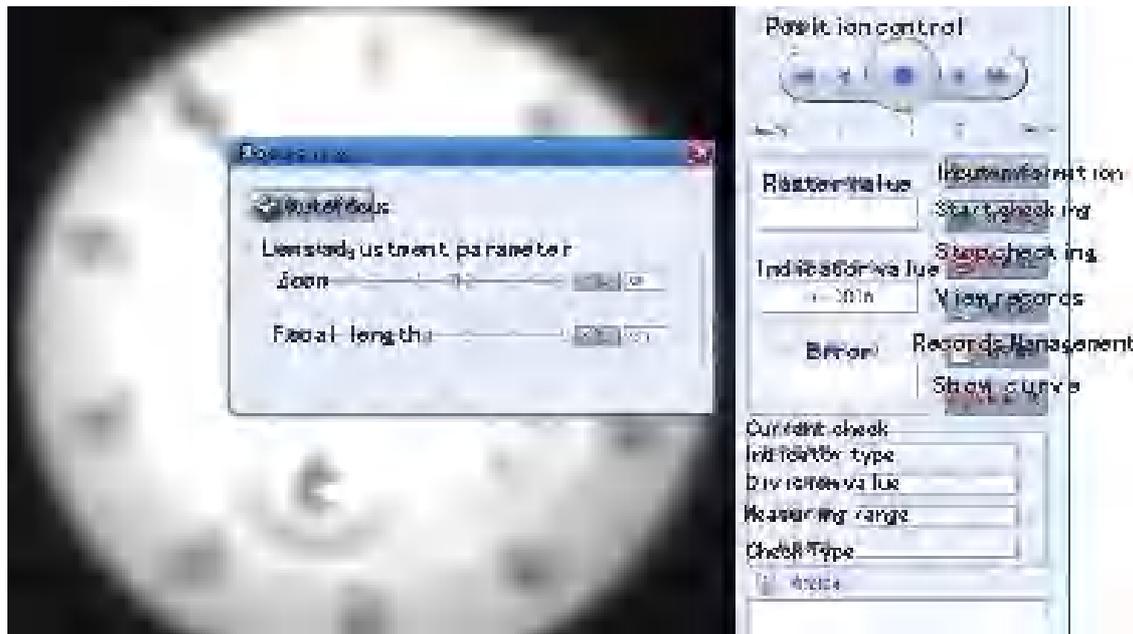

Figure 5-5 Autofocus before setting

Autofocus adjustment:

➤ By adjusting the value of "Magnification", the dial image can cover the best part of the image window.

➤ By adjusting the value of "Focal length", the image can be clear enough.

➤ You can adjust the focal length manually or by performing autofocus.

➤ When the image size is adjusted properly, you can click the "Autofocus" in the dialog box to focus on the image. See figure 5-6.
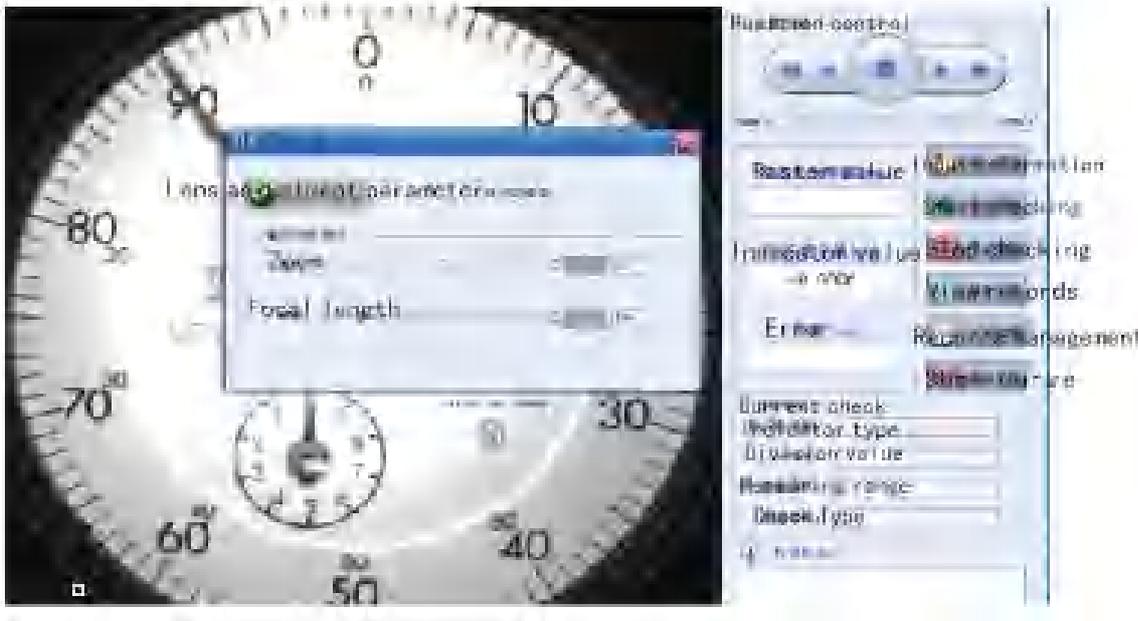
Figure 5-6 After autofocus

Notice	When the instrument is switched on, it will take self-test and the spindle will automatically return to zero position. Please make sure that no accessories are mounted to the spindle of the instrument before switching on the instrument, so as not to cause damage to the instrument.

5.2 Measurement of dial gauge with graduation of 0.01 mm

Measurement procedure

The following measurement steps discussed are based on the dial gauge with measuring range of 3 mm and graduation of 0.01 mm.

1. Switch on INSIZE Dial ISQ-DB50 and double-click the corresponding software icon on the desktop;

2. Install the dial gauge to be measured and adjust the image and spindle.

   "Installation of dial gauges" (page 41)

Figure 5-7 Installation of dial gauge with graduation of 0.01 mm

3. Set measurement information. See figure 5-8.

Setting parameters.

Gauge type	"Dial indicator" and "Dial"
Measurement program	Standard
Test type	Fully automatic
Measurement settings	Select "0.01 mm" for graduation, "3 mm" for measuring range, and "First test for measurement type and "100" for scale marks
Information and measurement items	Input the information about the dial gauge to be measured and material standard and the measurement items.

Figure 5-8 Information setting for dial gauge with graduation of 0.01 mm

4. Click "OK" to go back to the main window and adjust the image and align the pointer with zero. See figure 5-9.

Figure 5-9 Adjusted image of dial gauge with graduation of 0.01 mm

5. Click the "Start" button to start the automatic recognition of "0" as the beginning of the measurement. You can click the "Show curves" button to display the error curves in real time. See figure 5-10.
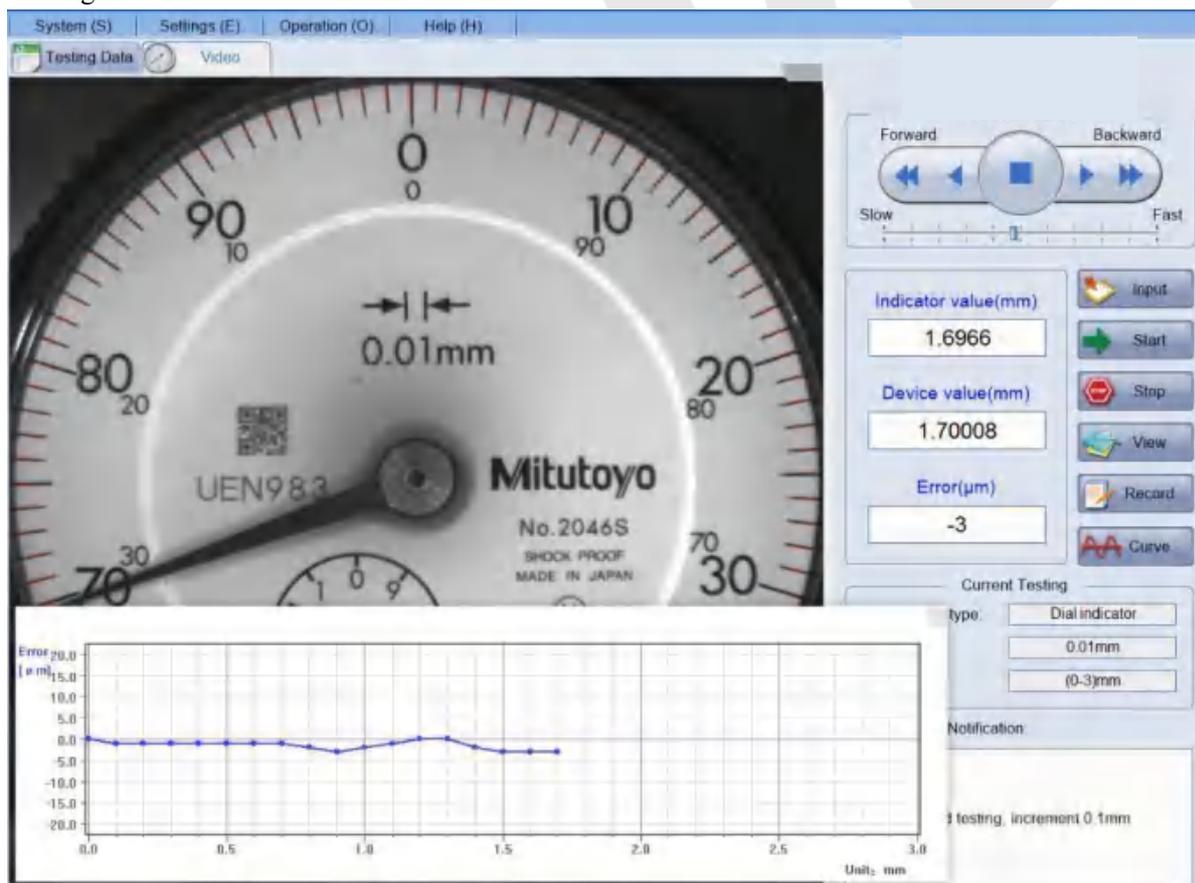
Figure 5-10 Measuring dial gauge with graduation of 0.01 mm

6. After measurement, click "Record management' to view the measured data. And the "Measurement guidance" window will show the measurement results. See figure 5-11.
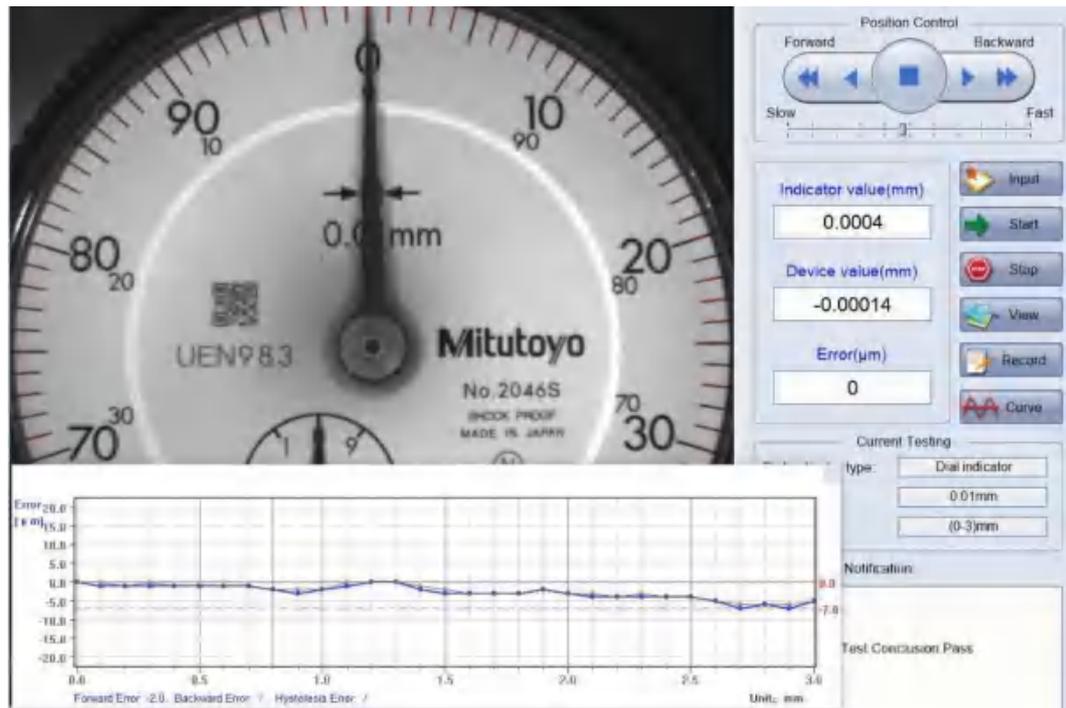
Figure 5-11 Measurement finished

7. By clicking the "Measured data" in the upper right corner, you can view the measured error of each point and error curves. See figure 5-12.
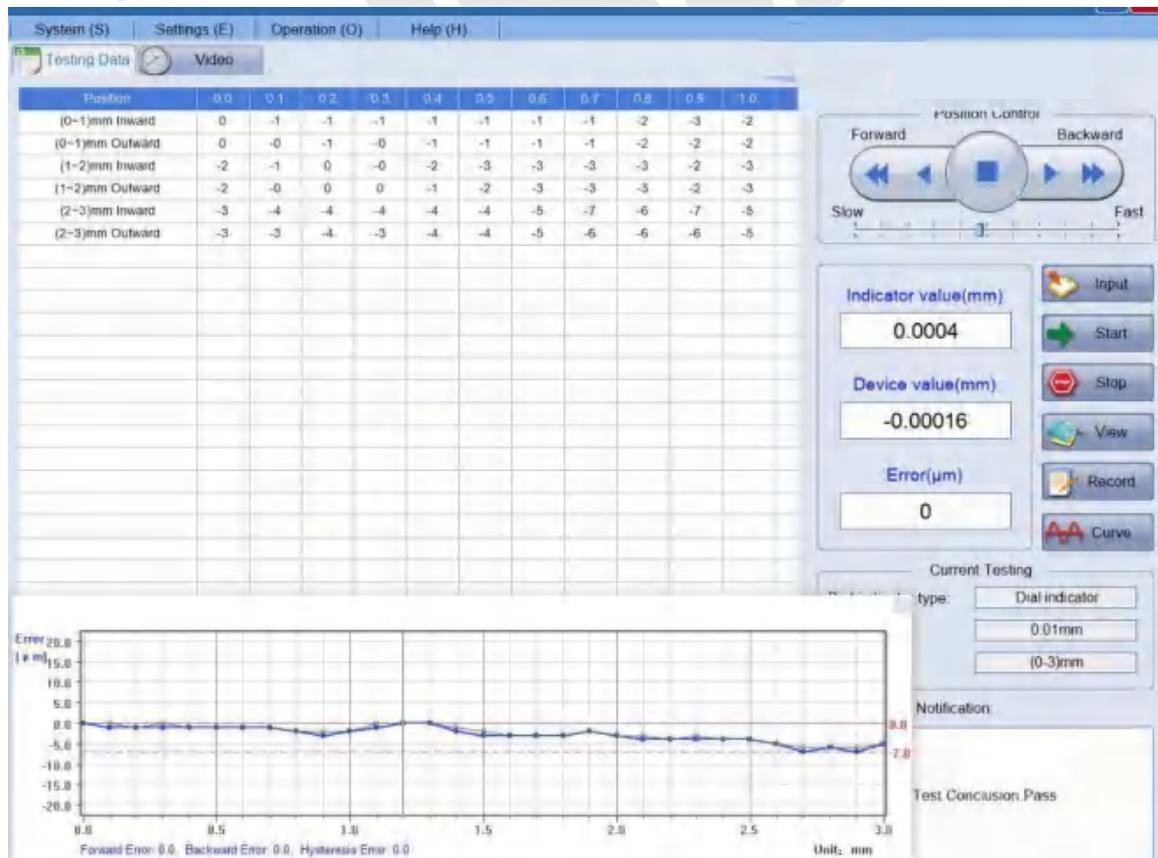
Figure 5-12 Measured data of dial gauge with graduation of 0.01 mm

INSIZE Dial ISQ-DB50 Series

8. By clicking the "View record" button, you can view the detailed record of the measurement, including the input measurement information, the measured data and the error curves. See figure 5-13.
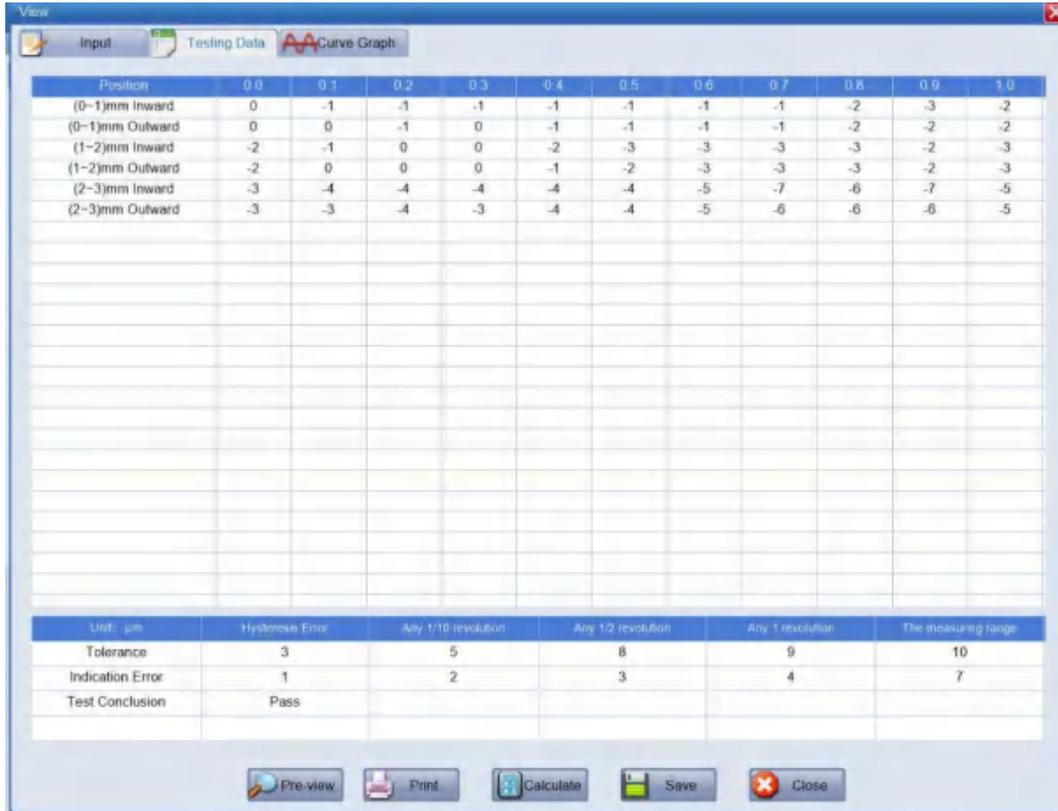
Figure 5-13 Record of dial gauge with graduation of 0.01 mm

9. By clicking the "Preview" button, you can preview and print the report. See figure 5-14.
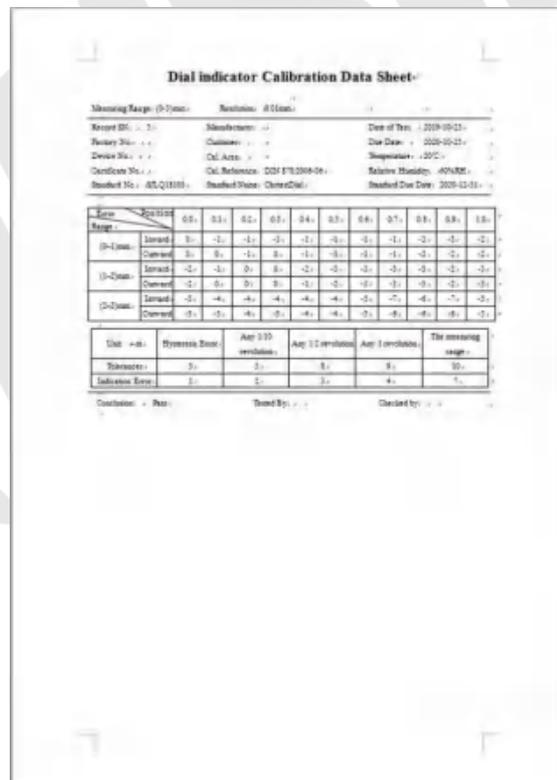
Figure 5-14 Report of dial gauge with graduation of 0.01 mm

5.3 Measurement of dial test indicator

Measurement procedure

The following measurement steps discussed are based on the dial test indicator with measuring range of 0.2 mm and graduation of 0.002 mm.

1.   Switch on INSIZE Dial ISQ-DB50 and double-click the corresponding software icon on the desktop;

2.   Install the dial gauge to be measured and adjust the spindle.

"Installation of dial gauges" (page 41)

Figure 5-15 Installation of dial test indicator

3.   Set measurement information. See figure 5-16.

Setting parameters.

Gauge type	"Dial test indicator" and "Dial"
Measurement program	Standard
Test type	Fully automatic
Measurement settings	Select "0.002 mm" for graduation, "0.2 mm" for measuring range, "First measurement" for measurement type, "100" for scale marks and "Regular dial gauge with accessories" for dial test indicator option.
Information and measurement items	Input the information about the dial gauge to be measured and material standard and the measurement items.

Figure 5-16 Information setting for dial test indicator

4. Click "OK" to go back to the main window and adjust the image and align the pointer with zero. See figure 5-17.

"Image adjustment and pointer alignment with zero" (page 41)

Figure 5-17 Adjusted image of the dial test indicator

5. Click the "Start" button to start the fully automatic measurement.

After the measurement in the direction I, a notification dialog box will appear, you can click the "Continue" button to continue the measurement.
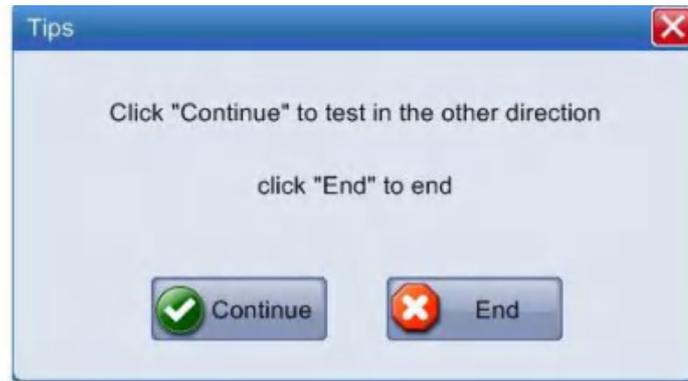
6. After measurement, you can click the "Record management" button to view the measured data. And the "Measurement guidance" window will show the measurement results. See figure 5-18
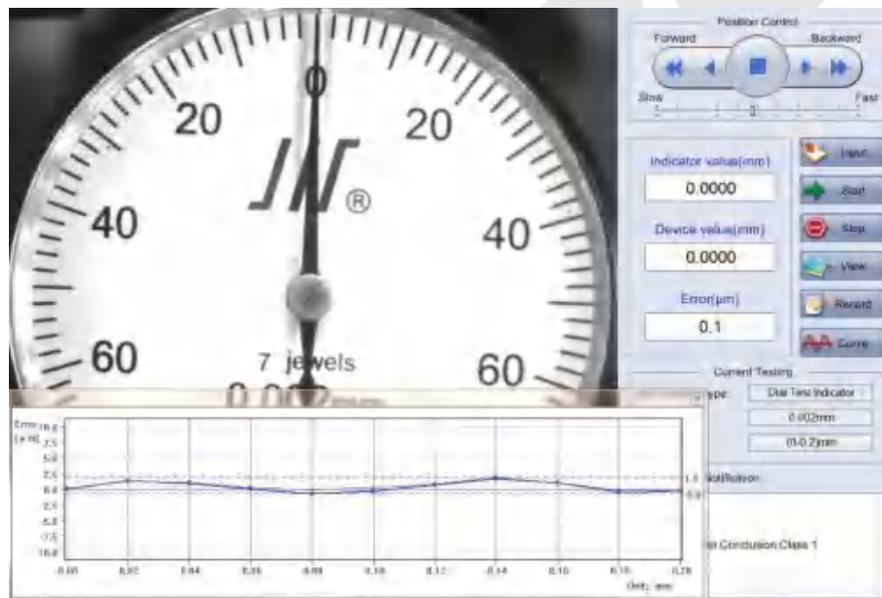
Figure 5-18 Measurement finished

7. By clicking the "View record" button, you can view the input measurement information, measured data and error curves and preview the report. See figures 5-19 and 5-20.
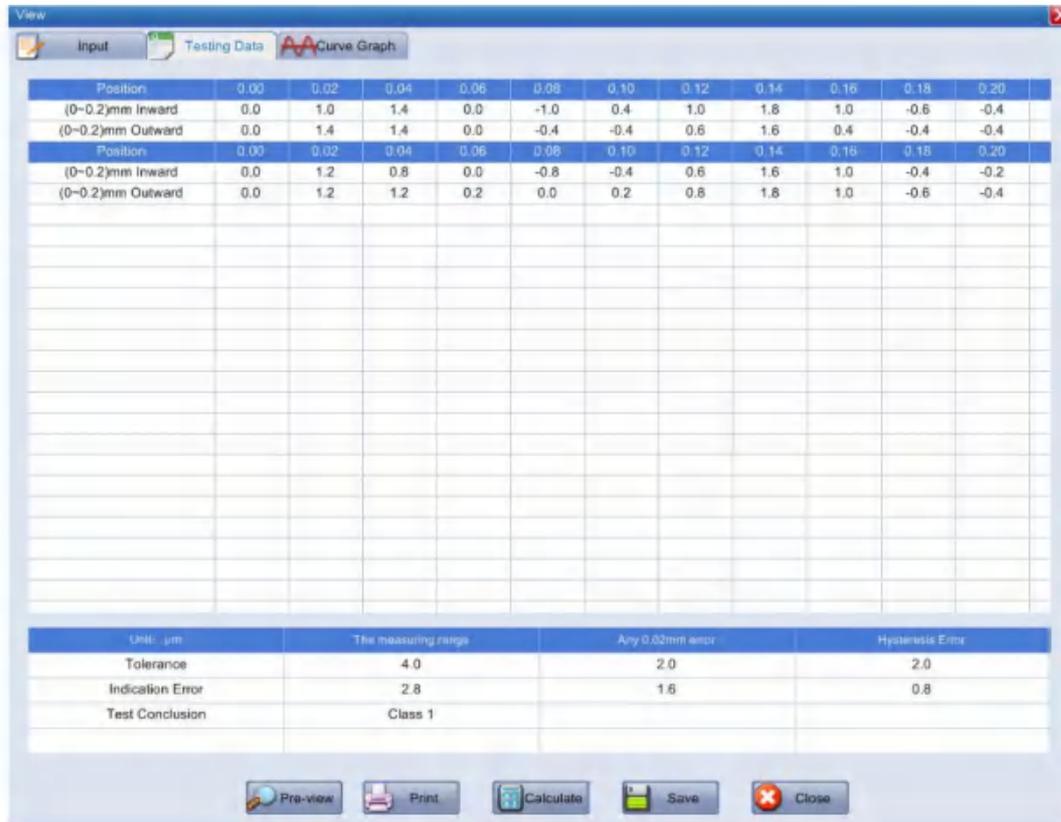
Figure 5-19 Record of dial test indicator
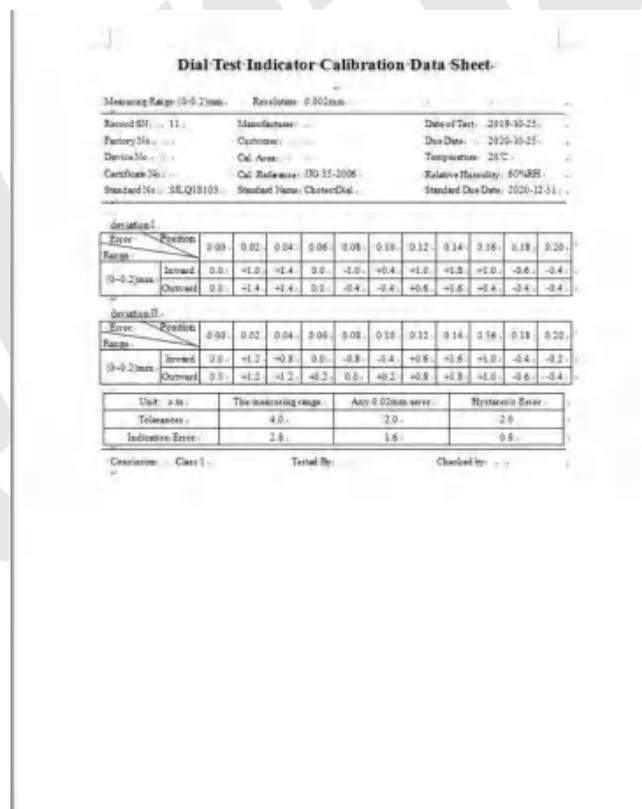
Figure 5-20 Report of dial test indicator

Differences of the measurement of regular dial test indicator and the measurement of bidirectional dial test indicator

Measurement differences

Regular dial test indicator without accessories	★ Do not mount the accessory to the spindle. ★ Select "Regular dial test indicator without accessories" in the "Dial test indicator option" box when inputting the measurement information. ★ The installation and measurement method for the measurement in the direction of I are the same as the dial test indicator with accessories. ★ Click the "Continue" button in the notification dialog box appeared after the measurement of the first direction, and then rotate the lever at 180° to continue the measurement in the direction II according to the steps mentioned above.
Bidirectional dial test indicator	★ The measurement operation in the direction I is the same as that of regular dial test indicator. ★ The pointer moves in a counter-clockwise direction in the forward travel during the measurement in the direction II. ★ Select "Regular dial test indicator without accessories" or "Bidirectional dial test indicator with accessories" in the "Dial test indicator option" box when inputting the measurement information. The measurement operation is the same as that of regular dial test indicator.

5.4 Measurement of dial bore gauges

Measurement procedure

The following measurement steps discussed are based on the bore dial indicator with positioning bridge and measuring range is 10 mm - 18 mm, 0.8 mm for work travel and 0.01 mm for graduation.

\ Point   The measurement operation of dial bore gauges is the same as dial gauge with graduation of 0.01 mm.

1. Switch on INSIZE Dial ISQ-DB50 and double-click the corresponding software icon on the desktop.
2. Install the dial gauge to be measured and adjust the spindle.

"Installation of dial gauges" (page 41)
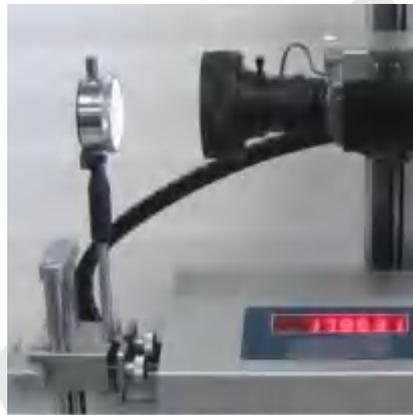
Figure 5-21 Installation of dial bore gauge

3. Set measurement information. See figure 5-22.

Setting parameters

Gauge type	"Dial bore gauge" and "Dial"
Measurement program	Standard
Test type	Fully automatic
Measurement settings	Select "0.01 mm" for graduation, "0.8 mm" for operation travel, 10 mm-18 mm for measuring range, "First measurement" for measurement type, "with positioning bridge" for dial bore gauge type and "100" for scale marks.
Information and measurement	Input the information about the dial gauge to be measured and material standard and the measurement items.

items	

Figure 5-22 Information setting for dial bore gauge

4. Selecting dial gauge

1. The software takes the dial gauge with graduation of 0.01 mm measured in the last time as the matched dial gauge by default. 2. If the matched dial indicator is not measured in the last time, you can click the "Select dial gauge" button to select it in the record list.	

5. Click "OK" to go back to the main window and adjust the image and align the pointer with zero. See figure 5-23.

"Image adjustment and pointer alignment with zero" (page 41)
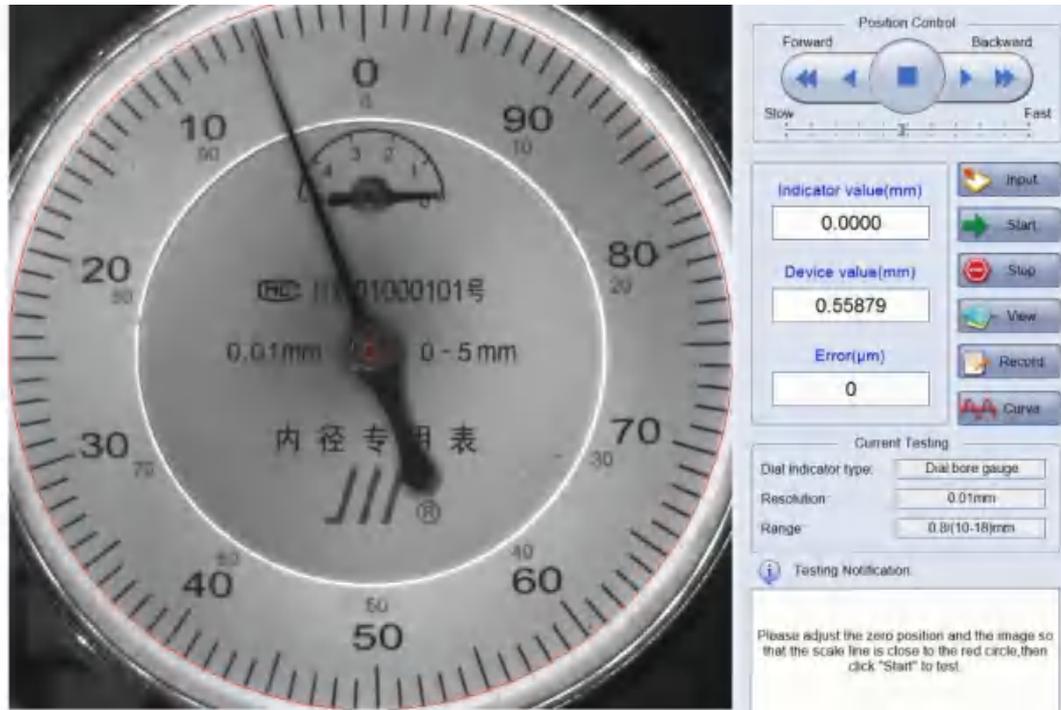
Figure 5-23 Adjusted image of the dial bore gauge

6. Click the "Start" button to start the automatic recognition of "0" as the beginning of the fully automatic measurement. After measurement, the software will automatically calculate the errors and the "Measurement guidance" window will show the measurement results. See figure 5-24.
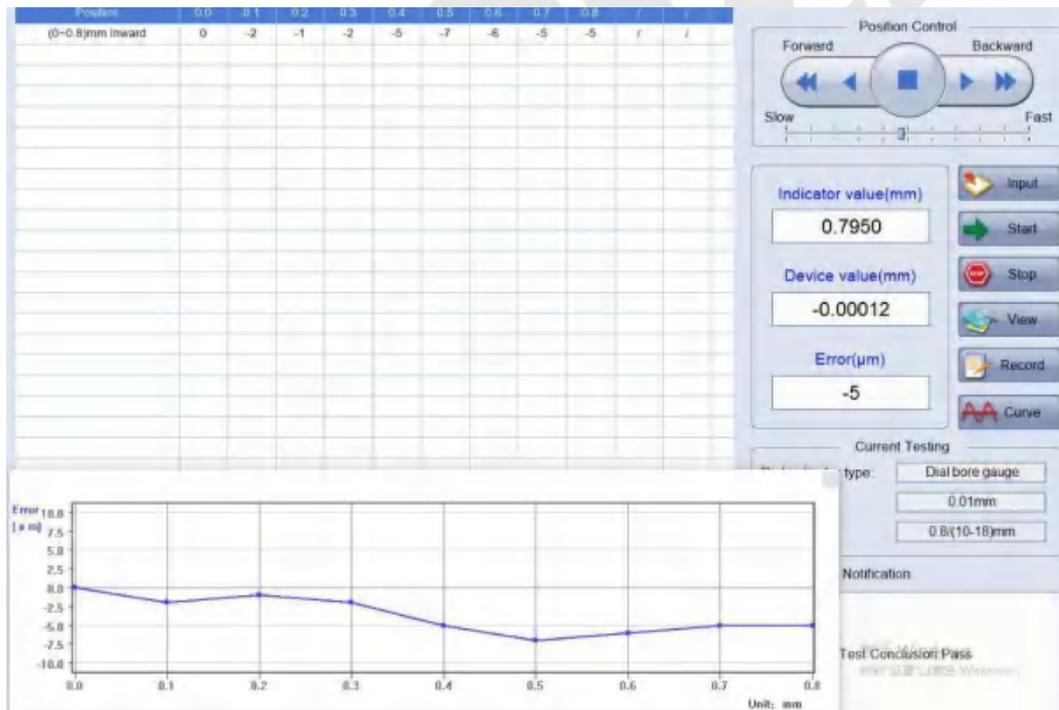
Figure 5-24 Measurement finished

7. You can click the "View record" button to view the measurement data and preview the report by clicking the 'Preview' button. See figures 5-25 and 5-26.

Figure 5-25 Record of dial bore gauge

Figure 5-26 Report of dial bore gauge

The setting of measuring range in the "Input measurement information" window is the major difference between the measurement of dial gauge with graduation of 0.01 mm and the one with wide range. For more information, refer to section 5.2 Measurement of dial gauge with graduation of 0.01 mm.

5.5 Measurement of digital indicator

Measurement procedure

The following measurement steps discussed are based on the digital indicator with resolution of 0.01mm and measuring range of 10 mm.

1.   Switch on INSIZE Dial ISQ-DB50 and double-click the corresponding software icon on the desktop.

2.   Install the digital indicator to be measured and adjust the spindle.

"Installation of dial gauges" (page 42)

3.   Set measurement information See figure 5-27.

Setting parameters

Gauge type	"Dial gauge" and "Digital"
Measurement program	Standard
Test type	Fully automatic
Measurement settings	Select "0.001 mm" for graduation, "10 mm" for measuring range, and "First measurement" for measurement type and "Positive"for "Digital indicator option.
Information and measurement items	Input the information about the dial gauge to be measured and material standard and the measurement items.

Figure 5-27 Information setting for digital indicator

4. Click "OK" to go back to the main window and adjust the image. See figure 5-28.
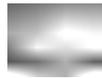
"Image adjustment procedure of digital indicator" (page 42)
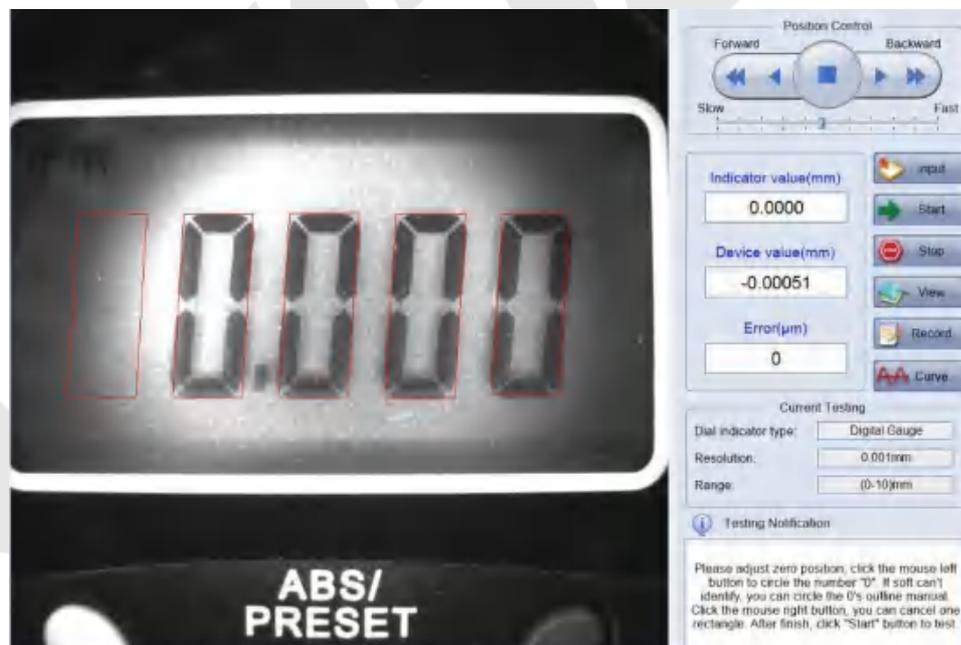
Figure 5-28 Adjusted image of the digital indicator

5. Click the "Start" button to start the fully automatic measurement. You can click the "Show curves" button to display the error curves in real time. See figure 5-29.
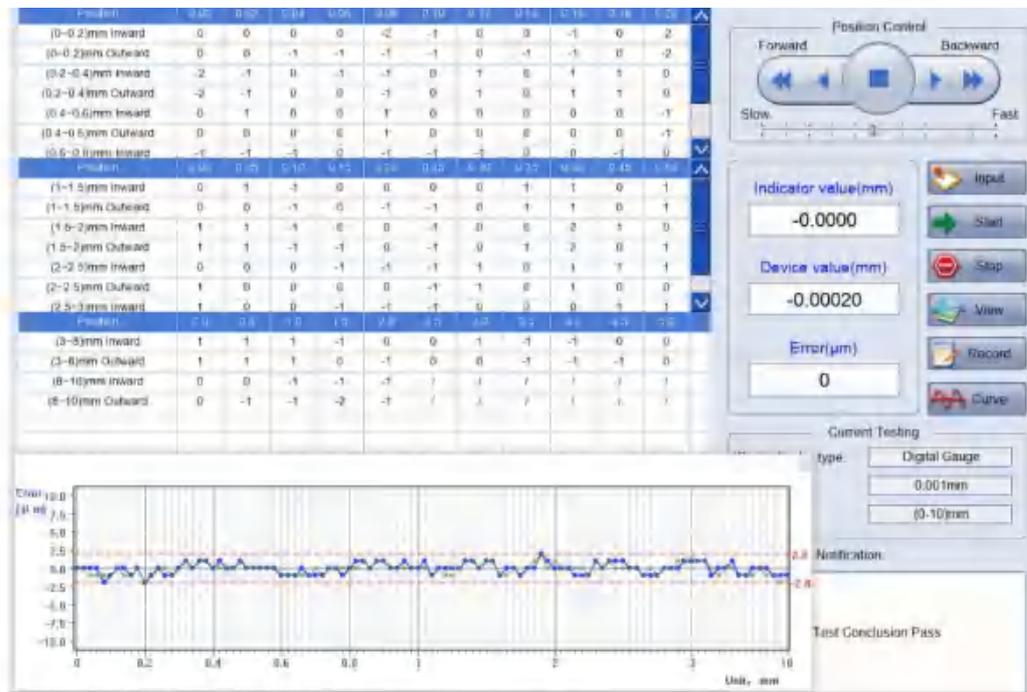
Figure 5-29 Measurement finished

6. Refer to section 5.2 Measurement of dial gauge with graduation of 0. 01 mm for completing the operation.

| **\ Point** | As the resolution of the digital dial indicator is 10 μm, consequently the error data is also accurate to 10 μm. All error data may be zero for the digital indicator of good performance. |

5.6 Semi-automatic measurement

Measurement procedure

| **Reference** | For the dial gauge with obvious contamination on dial or scale marks, the software is not able to automatically identify the indication. You can apply the semi-automatic measurement. |

The following measurement steps discussed are based on the dial gauge with measuring range of 3 mm and graduation of 0.01 mm.

1. Switch on INSIZE Dial ISQ-DB50 and double-click the corresponding software icon on the desktop.

2. Install the dial gauge to be measured and adjust the image and spindle.

"Installation of dial gauges" (page 41)

3. Set measurement information See figure 5-30.

Setting parameters

Gauge type	"Dial indicator" and "Dial"
Measurement program	Standard
Test type	Semi-automatic
Measurement settings	Select "0.01 mm" for graduation, "3 mm" for measuring range, and "100" for scale lines.
Information and measurement items	Input the information about the dial gauge to be measured and material standard and the measurement items.

Figure 5-30 Information settings of automatic measurement

4. Click "OK" to go back to the main window and adjust the image and align the pointer with zero.

"Image adjustment and pointer alignment with zero" (page 41)

5. Click the "Start" button to start the semi-automatic measurement. You can follow the "measurement guidance" to perform the operation followed.

Reference	⟩	Rotate the hand wheel to drive the spindle until the pointer is exactly at the location of 0.1 mm, and then press the "Sampling" button on the instrument panel or button box. Continue rotating the hand wheel unit the pointer reaches exactly the position of 0.2 mm and then press the "Sampling" button again.
	⟩	Repeat the operation to complete the measurement of the whole measuring range of 3 mm at a measurement interval of 0.1 mm.
	⟩	Continue to rotate the hand wheel until pointer moves forward by 0.1 mm; rotate the hand wheel in the opposite direction until the pointer is exactly at the location of 3 mm and then press the "Sampling" button.
	⟩	Perform the measurement operation in a similar way until the pointer move back to the zero position.
	⟩	After measurement, the software will automatically calculate the errors and the "Measurement guidance" window will show the measurement results.

6. By clicking the "View record" button, you can view the measurement record and preview record. See figure 5-31.

Dial indicator Calibration Data Sheet

Measuring Range: (0-3)mm   Resolution: 0.01mm

Record SN: 12	Manufacturer:	Date of Test: 2019-10-28
Factory No:	Customer:	Due Date: 2020-10-28
Device No:	Cal Area:	Temperature: 20°C
Certificate No:	Cal Reference: JJG 34-2008	Relative Humidity: 60%RH
Standard No: SJLQ18103	Standard Name: ChetestDial	Standard Due Date: 2020-12-31

Error Range	Position	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
(0~1)mm	Inward	0	-1	-1	-1	-3	-2	-3	-1	-1	-2	-1
	Outward	+2	+1	-1	-2	-2	-1	-1	-1	-2	-2	-1
(1~2)mm	Inward	-1	0	+1	+1	+2	+2	+4	+4	+3	+4	+4
	Outward	-1	0	+1	+2	+2	+3	+4	+4	+3	+4	+3
(2~3)mm	Inward	-4	-3	+2	+1	+1	0	-2	-2	-1	-1	-1
	Outward	+3	+3	+3	+2	0	0	-1	-1	-2	-2	-2

Unit: μm	Any 0.1mm error	Any 1mm error	The measuring range	Hysteresis Error
Tolerance	5	10	14	3
Indication Error	2	6	7	2

Conclusion: Pass   Tested By: Checked by:

Figure 5-31 Report of semi-automatic measurement

5.7 Manual measurement

Measurement procedure

1. Press the "Auto/Manual" button on the panel of instrument to switch to the "Manual" state. The glass-scale indication will then be displayed on the panel.

2. Rotate the hand wheel align the pointer with zero, and then press the "Slow forward/Zero" button to zero the indication of glass-scale and start the measurement. Fill in the prepared table with the measured data.

3. As the measurement is completed, you can calculate the error values and then make the judgement if the dial gauge is qualified according to the obtained data.

\ Point

Manual measurement applied to the blank table in the "Input measurement information" window. You must rotate the hand wheel to drive the spindle and all the measured data must be filled in the prepared table, the software do not process the data.

Chapter 6   Troubleshooting

What to do if...

When you are sure that the machine is not functioning properly, it is advisable to take the solutions below which can fix the problems that you can handle by yourself and saves you time in the meanwhile, but if not, please contact the distributor or service technician personnel.

1. **Fault: no display and no response to button pressing after the instrument is switched on.**

    Cause: the power supply is not connected properly.

    Solution: check the power connection and the power plug socket.

2. **Fault: the instrument warms during the power-on self-test process.**

    Cause: the spindle is extended or retracted too much, exceeding the measuring limits.

    Solution: manually rotate the hand wheel to retract or extent the spindle.

3. **Fault: blurry computer screen**

    Cause: the computer runs other software or the camera USB interface is not connected properly.

    Solution: exit other software and re-start the INSIZE Dial ISQ-DB50 software, and make sure the
              camera USB cable is connected properly and the camera driver is installed properly.

4. **Fault: the "Image has not been adjusted properly, please re-adjust it" message appears when clicking the "Start" button.**

    Cause: the image is not clear or has interference.

    Solution: re-adjust the image as required before starting the measurement again.

5. **Fault: black screen appears in image window.**

    Cause: the video cable is not connected properly.

    Solution: check the video connection.

6. **Fault: the image is incomplete or only half of it is displayed.**

    Cause: the computer is not set properly.

    Solution: exit the software and then change the colour depth of display to 8-bit colour (256 colours) or higher in the computer operating system.

7. **Fault: the spindle does not move after clicking the "Start measurement" button and no "tick" sound is heard from the instrument after clicking the "Stop".**

    .

    Cause: no communication between the instrument and the computer.

    Solution: make sure the serial port of the instrument is connected properly and correctly set the serial number in the software.