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TIANGEN BIOTECH (BEIJING) Co., LTD

**Version no.: OS241210**

# TGuide S32 Pro Nucleic Acid Extractor

# User Manual

| Model | Product Name |
|---|---|
| TGuide S32 Pro | TGuide S32 Pro Nucleic Acid Extractor |

# Table of Contents

## Important Instructions

The following basic safety measures must be strictly implemented during the operation, maintenance and repair of this instrument. Failure to implement these measures or the warnings indicated elsewhere in this manual may affect the safety measures provided by this instrument. This can also undermine the safety standards of design and manufacturing, as well as the intended use range of the instrument. TIANGEN does not assume any responsibility for any consequences resulting from the user's failure to comply with the following requirements.

**1 Caution**

a) Instrument grounding

To avoid electric shock, the input power cord of the instrument must be reliably grounded. This instrument uses a three-prong grounded plug with a 3rd (ground) pin that can only be used with a grounded type of power outlet, which is a safety device. If the plug cannot be inserted into the socket, ask an electrician to install the correct socket and do not make the grounded plug unsafe.

b) Keep away from live circuits

Operators should not open the instrument without permission. Changing components or making adjustments to the instrument must be done by licensed professional maintenance personnel. Do not change components with the power cord connected.

c) Attention to using the power supply

Before connecting the AC power supply, ensure that the voltage of the power supply is the same as the voltage required by the instrument (±10% deviation is allowed). Additionally, ensure the power socket's rated load is not less than the requirement of the instrument.

d) Pay attention to the power cord

The instrument should normally be used with the supplied power cord. If the power cord is broken, it must be replaced instead of repaired. Replacement must be done with the same type and specification of power cord instead. Do not press anything on the power cord when using the instrument. Do not place the power cord in a place where people walk around.

e) Power cord plugging in and plugging out

Power cord plugging in/out must be done directly by the handheld plug. The plug should be fully inserted into the socket, and do not pull hard on the power cord when plugging out.

f) Pay attention to the placement of the instrument

The instrument should be placed indoors, in a well-ventilated place with no corrosive gas or strong magnetic field interference. Do not place the instrument in a humid or dusty place.

The openings on this instrument are provided for ventilation. To avoid overheating the instrument, be sure not to block or cover these ventilation holes. When multiple instruments are used simultaneously, the distance between two instruments should be no less than 70 mm. High ambient temperature can affect the performance of the

instrument or cause malfunction. Do not use the instrument in direct sunlight and keep it away from heaters, stoves, and all other heat sources.

When not using this instrument for a long time, unplug the power supply and cover the instrument with soft cloth or plastic film to prevent dust from entering.

g) Cleaning

Please disconnect the power cord before cleaning. Only use 75% ethanol to clean the instrument surface. Exposure to pesticides, benzene or diluents should be avoided.

**Note: If users encounter the following situations, immediately unplug the instrument from the power outlet and contact TIANGEN or ask professional maintenance personnel to handle the situation:**

- Power cord or plug is damaged;
- Spilling of liquid or entry of objects in the control part of the instrument;
- Instrument controls partially exposed to rain or water;
- The instrument is not working properly, especially if any unusual sounds or smells are present;
- The instrument is dropped or the shell is damaged;
- Apparent change in instrument function.

**2 After-sales Service**

a) Warranty

This instrument is warranted by TIANGEN for 12 months from the delivery date for failures caused by defects in materials and manufacturing.

During the warranty period, TIANGEN will repair or replace, at its option, instruments that proved to be defective. User should send instruments to TIANGEN for repair.

For repairs beyond the warranty period, TIANGEN will charge the appropriate repair fees.

b) Warranty Coverage

The above warranty does not apply to damage caused by improper use or maintenance by the user, use under non-conforming conditions, and unauthorized repair or modification.

**Note: After the instrument is unpacked, the contents of the packing box should be inspected according to the packing list in time. If users find any damaged or missing items, please contact TIANGEN immediately.**

**Please keep the packing box and materials properly after the instrument is unpacked for maintenance convenience. TIANGEN will not be responsible for any damage to the instrument caused by improper packing during the delivery to the service department.**

## I. Instrument Introduction

### 1. Instrument Characteristics

The TGuide S32 Pro Nucleic Acid Extractor automates magnetic separation in the nucleic acid purification process by controlling a stepper motor via a microcontroller to achieve a precision drive.

The TGuide S32 Pro is small in size, light in weight and attractive in appearance. It has a large LCD display, an embedded real-time operating system, a powerful program editing function, and is simple and easy to manipulate. Additionally, the working area is fully enclosed, with open door protection, an over-limit protection and an alarm, making it safe and reliable to use. With the dedicated reagents and consumables, it can extract the nucleic acid from blood, cells, tissues, viruses, serum, plasma and other samples automatically, producing reproducible results while saving time.

### 2. Normal Operating Conditions

Ambient temperature: 10°C-30°C

Relative humidity: 20%-70%, no condensation

Operating power: AC100-240V, 50-60Hz

**Note: Before using the instrument, please confirm that the working conditions meet the above requirements. Pay special attention to whether the power cord grounding is reliable.**

### 3. Transport and Storage Conditions

Ambient temperature: -20°C~55°C

Relative humidity: ≤ 80%

### 4. Performance Parameters

Table 1: Basic Parameters of the Instrument

| Product Name | TGuide S32 Pro Nucleic Acid Extractor |
|---|---|
| Sample Throughput | 1~32 |
| Number of Magnetic Rods | 4×8 |
| Sample Processing Volume | 20-1000 μl |
| Temperature Control Range | Room temperature -120°C |
| Magnetic Bead Collection Efficiency | ≥98% |
| Dimension (W × H × D) | 442 mm × 465 mm × 385 mm |

### 5. Applications

This product can be used in molecular biology laboratories for the isolation and extraction of nucleic acid.

## II. Preparation of the Instrument for Use

### 1. Schematic Diagram of the Instrument Structure

1.1 Instrument Front


Figure 1: Front of the Instrument

1.2 Instrument Rear


Figure 2: Back of the Instrument

1.3 Instrument Side

Figure 3: Side of the Instrument

## 2. Check before Start-Up

Before powering up the instrument, the following should be confirmed:

a) The power supply is compatible with the rated voltage of the instrument;

b) The power cord plug is reliably inserted into the power outlet;

c) The power cord is reliably grounded;

d) The Magnetic Rod Tip Comb and the Deep Well Plate (or the Single Sample Reagent Cartridge Tray) are placed in the correct places.

## 3. Consumables Placement

3.1 Deep well plate placement

The plate position for placing the deep well plate has four heating blocks. To the left and right side are the limit blocks and metal springs for positioning and fixing the 96 deep well plate. Pay attention to the orientation when placing the deep well plate (deep well plate notch should be facing outward), and do not place the deep well plate out of the positioning area.

3.2 Single sample reagent cartridge placement

The single sample reagent cartridge tray is placed in the same way as the 96 deep well plate. 1-8 single sample reagent cartridges can be placed on each tray, and the number of single sample reagent cartridges can be determined according to the number of samples. The illustration of the single sample cartridge placement is shown below.

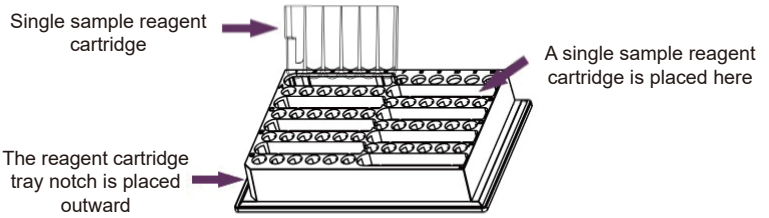



Figure 4: Single sample reagent cartridge placement instruction

3.3 Magnetic rod set up

Press down the fixing spring plate and insert the eight-well tip comb into the fixing slots to the end. When taking out, first press the fixing spring plate on the tip comb, and then pull out.

**Note: Please make sure that the tip combs are inserted correctly before starting the program, as contamination or damage to the magnetic rods caused by inappropriate set up is not covered by the warranty.**

## 4. Instrument Start-up

Turning on the power switch. The instrument will display a reminder to remove the consumables. After confirming that the consumables are removed, the instrument will perform a self-test. The self-test takes about 10 seconds. Please wait until it finishes. If there is no problem found during the self-test, the screen will display the home page of the system, where users can edit, view, modify, delete, and run other operations of the protocols.

## III. Protocol Settings and Instrument Operation

**Note: After the instrument is turned on, if there is abnormal sound or display, or if there are fault alarms or alerts during the instrument self-test, please turn off the power immediately and contact the supplier.**

### 1. Home Page

The instrument will enter the home page of the interface immediately after starting up the self-test, with the instrument diagram on the left and the function buttons on the right. From top to bottom are Run, New , UV lamp and Setting The following figures show the home page when the program is not being run and the home page when the program is running, respectively.


Figure 5: Home page when the program is not running

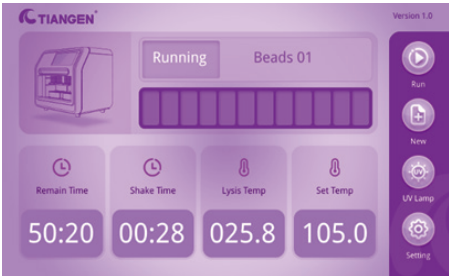



Figure 6: Home page when the program is running

### 2. New/Edit Protocol

Click the New button on the home page to enter the program editing interface. This is where users can add new steps, delete steps, edit step parameters, and run the program.

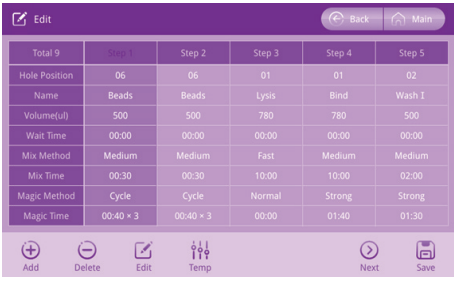



Figure 7: Program Editing Page

Table 2: Program Edit Page Icon Description

| Icon | Function |
|---|---|
|  | Add a new step. If a step is selected, add a new step after that step. |
|  | Delete the steps. |
|  | Temperature setting. Click to enter the temperature setting interface. |
|  | Previous page. The Editing interface displays 5 steps by default, if there are more than 5 steps the page can be turned to view the rest. |
|  | Next page. The Editing interface displays 5 steps by default, if there are more than 5 steps the page can be turned to view the rest. |
|  | Save. Click to enter the file saving page. Users can edit the program name. |

### 3. Parameter Setting

Double click on the selected step to enter the step parameter setting page. A variety of parameters can be set, including the hole position, the mixing step, and the binding steps. See the following table for specific instructions and click OK after setting to save the current setting parameters.

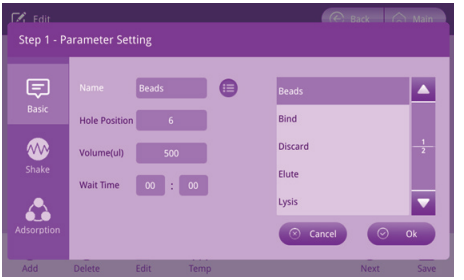



Figure 8: Step Parameter Setting

| Option Name | Function |
|---|---|
| Hole Position | 1-6 (optional). |
| Name | Touch the dropdown list behind the name. Select the step name. If users need to modify the preset name, please check the Section 8. System Settings. |
| Waiting Time | The waiting time before the current step starts. Range 0~99 min 59sec. |
| Mixing Method | There are 3 stages of different mixing modes can be set. For each stage the time range is 0~99 min 59 sec. A total of 8 mixing modes can be selected, including the Slow, Medium, Fast, Bottom Mix, Half Mix, Magnetic Rod Mix, Bottom Pause, and Pause. After each mixing mode and the time is set, the system will automatically add up the mixing time of the entire step. |
| Binding Method | 3 types of binding methods can be selected: Normal, Powerful and Cyclic, with time ranges from 0 to 99 min 59 sec, of which the number of cycles in the cyclic binding mode can be selected from 1 to 5. |
| Volume | Set the input volume of the well. The range is 1-1000 µl. |

### 4. Temperature Setting

Click the Temperature button on the Editing page to enter the temperature setting page, and users can set the temperature for the lysis and elution steps.

### 5. Save and Run

After the protocol editing is completed, click the Save button at the bottom right corner of the screen to enter the file save page. Type the file name to save. If the protocol is not to be viewed, modified or run by others, users can enter the password. After saving, you can click the Run button below to start running the protocol.

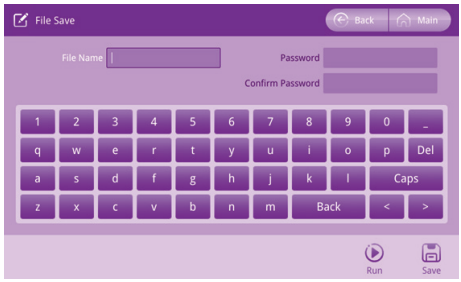



Figure 9: File Saving Page

### 6. Operation Log

After the instrument is turned on, a run log will be generated, recording the program running, modification, deletion, new protocol creation, importing protocols, exporting protocols, parameter setting, firmware upgrade, user creation, user deletion, exporting log, and emptying operation actions. Users can export the log in the System Settings page. When the log that has not been exported occupies more than 75% of the log storage space, the user will be reminded to export the log after each power-on self-test. The user can choose to export, empty the operation or ignore the reminder. When the log storage space is full, the user will be reminded again to export the log before recording a new log. If users choose to ignore the reminder, the instrument will automatically overwrite the log and then continue to perform the next operation.

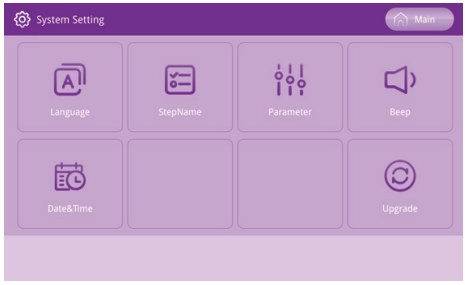



Figure 10: System Setup Page

## 7. UV Disinfection Setting

Click the UV lamp button on the home page of the instrument to enter the UV disinfection setting page. Enter the time and click the OK button. The UV lamp will light on and the instrument will display the countdown timer. The UV lamp will light off automatically when the time is over.

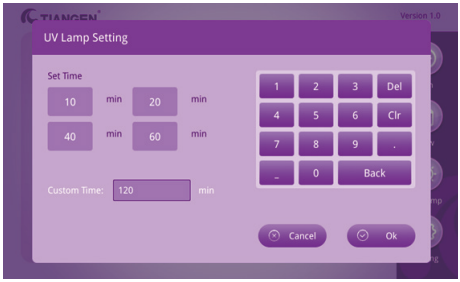


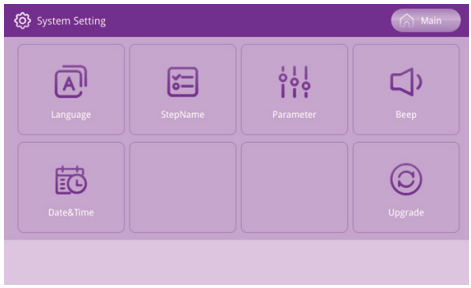

Figure 11: UV Disinfection Setting Page

## 8. System Setup

System setup page for language setting, date/time setting, backlight adjustment, motion parameters, screen calibration, sound, name management, and system updates.

Table 4: System Setup Page Icon Description

| Icon | Function |
|---|---|
| | Language. System language is switchable between Chinese and English. |
| | Date & Time. The current date and time of the instrument can be modified. |
| | Backlight adjustment to adjust the screen brightness. |
| | Motion parameters for engineers' calibration use. Please do not modify the parameters without authorization. |
| | Screen calibration. Follow the operation guidelines for screen calibration. |
| | Sounds. Users can set to turn on or off the alarm sound, keyboard clicks and finish sound. |
| | Step name management. There shows all current step names that can be created, deleted or cleared. When creating a new step name, only English characters, numbers and underscores are allowed. There is a maximum of 12 characters allowed, but no more than 8 characters are recommended. |
| | System update and firmware program upgrade. |




## IV. Troubleshooting

This section introduces the possible problems observed of the TGuide S32 Pro Nucleic Acid Extractor, the possible reasons and the solutions.

| S/N | Problem | Possible Reason | Solution |
|---|---|---|---|
| 1 | The display does not light up after turning on the power switch | Power is off | Check power supply and turn it on |
| | | Switch damage | Replace the switch |
| | | Blown fuse | Replace the fuse (F 250V 3A Φ5×20) |
| | | Others | Contact TIANGEN |
| 2 | After turning on the power switch, there is a "buzzing" alarm sound, followed by a display indicating a system error | Self-test error | Contact TIANGEN |
| 3 | Abnormal screen display | Loose circuit connection<br>Screen control chip damage | Contact TIANGEN<br>Contact TIANGEN |
| 4 | Screen buttons do not work | Touch screen damage | Contact TIANGEN |
| 5 | The UV lamp does not light up | UV lamp damage | Replace the UV lamp<br>Contact TIANGEN |

**Note: within the warranty period, it is strictly prohibited for users to disassemble the instrument. If any problems above that requires disassembly or inspection occurs, please contact TIANGEN in time.**