ALLSHENG

Auto-NGS 100R

Automated NGS Library Preparation Workstation

Automatic Efficient Accurate Open

——Automated library construction solution for gene sequencing process

HANGZHOU ALLSHENG INSTRUMENTS CO., LTD.

Next-Generation Gene Sequencing Workflow

Sample Purification	Sample Quantification	Generate Library	Library Quality Control	Sequencing	Analysis
Automated Nucleic Acid Extraction	Micro-Spectro-photometer	NGS Library Preparation Workstation	Fluorometer Capillary Electrophoresis	Sequencer	Data Analysis

Allsheng Supporting Products:

Automated nucleic acid purification system, micro-spectrophotometer, automated NGS library preparation workstation, fluorometer, fluorescence microplate reader, multi-mode microplate reader, etc
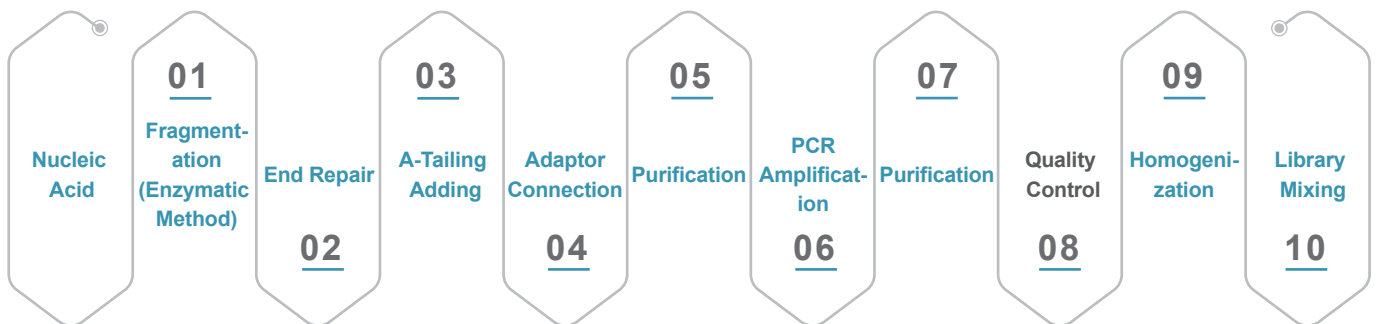
Auto-NGS 100R

Automated NGS Library Preparation Workstation

Auto-NGS 100R can construct 24 sample libraries in one run. Friendly software, supporting hardware and professional team ensure that you can run the actual samples in a short time, thus providing you with a good library preparation experience.

▌ Introduction of DNA Library Construction Workflow

Nucleic Acid

01 Fragment-ation (Enzymatic Method)

End Repair **02**

03 A-Tailing Adding

Adaptor Connection **04**

05 Purification

PCR Amplificat-ion **06**

07 Purification

Quality Control **08**

09 Homogeni-zation

Library Mixing **10**

Note: Auto-NGS 100R can achieve the whole process of library construction except for "quality control"

NGS sequencing is the mainstream gene sequencing technology, and the market will continue to expand rapidly in 2022-2026. With the continuous progress of NGS sequencing technology and the declining cost, it has gradually replaced the first generation sequencing technology to become the mainstream of the market. It can be widely used in prenatal testing, disease screening, disease diagnosis, etc. Based on this, we launched Auto-NGS 100R automated NGS library preparation workstation.

Auto-NGS 100R is based on the direct loading of nucleic acid samples to realize the full-automatic library construction process of fragmentation, end repair, adaptor connection and PCR amplification. The single/8-channel pipettor is with pipetting range of 1 - 200 μL. With accurate PLLD/CLLD and multiple liquid parameter settings, it can flexibly handle samples and reagents of different properties and volumes to meet various application scenarios. The workstation's program interface is graphical, the content of process error report is specific, and the PC program runs dynamically, so that users can quickly get familiar with the software and successfully set up the entire experimental process. At the same time, the workstation integrates heating and cooling module, magnetic plate lifting module, PCR thermal cycle module, UV sterilization lamp and efficient purification filter module, ensuring efficient library construction and eliminating cross-contamination.

PRODUCT FEATURES

Precise Pipetting

The self-developed high-precision 8-channel pipettor can be used as a single channel;

A variety of liquid parameters setting ensure accurate control of liquid aspirating and dispensing process;

Capacitive and air pressure detection function can sensitively detect the liquid level, residual liquid and blockage, ensuring accurate control of the pipetting volume.

Simple Operation, Get Started Quickly

Multi-level account management system supports the different needs of new users and advanced users;

Drag-and-drop flows simplifies program setting;

GUI is easy to understand and edit;

New users can also quickly master the operation methods of library construction.

Flexible Matching Experiment Needs

Equipped with several temperature control modules to meet the special temperature requirements such as reagent and sample storage;

High efficiency magnetic module by rising and falling to avoid loss or residual of magnetic beads;

The fully automatic thermal cycling module can effectively prevent cross-contamination and meet the nucleic acid amplification process in the process of library construction.

Intelligent & Visual

Allow users to freely choose running part or all of the experimental processes;

Program setting error reporting and prompt functions ensure that users can quickly find programming errors;

TIP area prompts the experimental demand, current available amount and whether it is sufficient to ensure the smooth progress of the experiment;

The PC simulation operation experiment function can enable users to find problems at any time and avoid wasting samples, reagents and time.

Multiple Functional Modules

9 tiles (including TIP area, sample area, reagent area) + (TIP off box and waste liquid container) are designed to meet the needs of various library construction kits;

The experimental platform can customize different modules according to the actual needs of customers to meet various experimental solutions;

The program design feature that can be saved separately enables the same program to quickly run the experimental process only by changing the number of samples.

Efficient Pollution Prevention

Equipped with efficient purification and filter system (positive pressure HEPA system) and UV sterilization to prevent cross-contamination of the experimental cabin;

The PCR module in Auto-NGS 100R can use disposable automatic cover or conventional sealing cover to avoid condensation on the top and reduce the risk of cross-infection.

Plate Layout
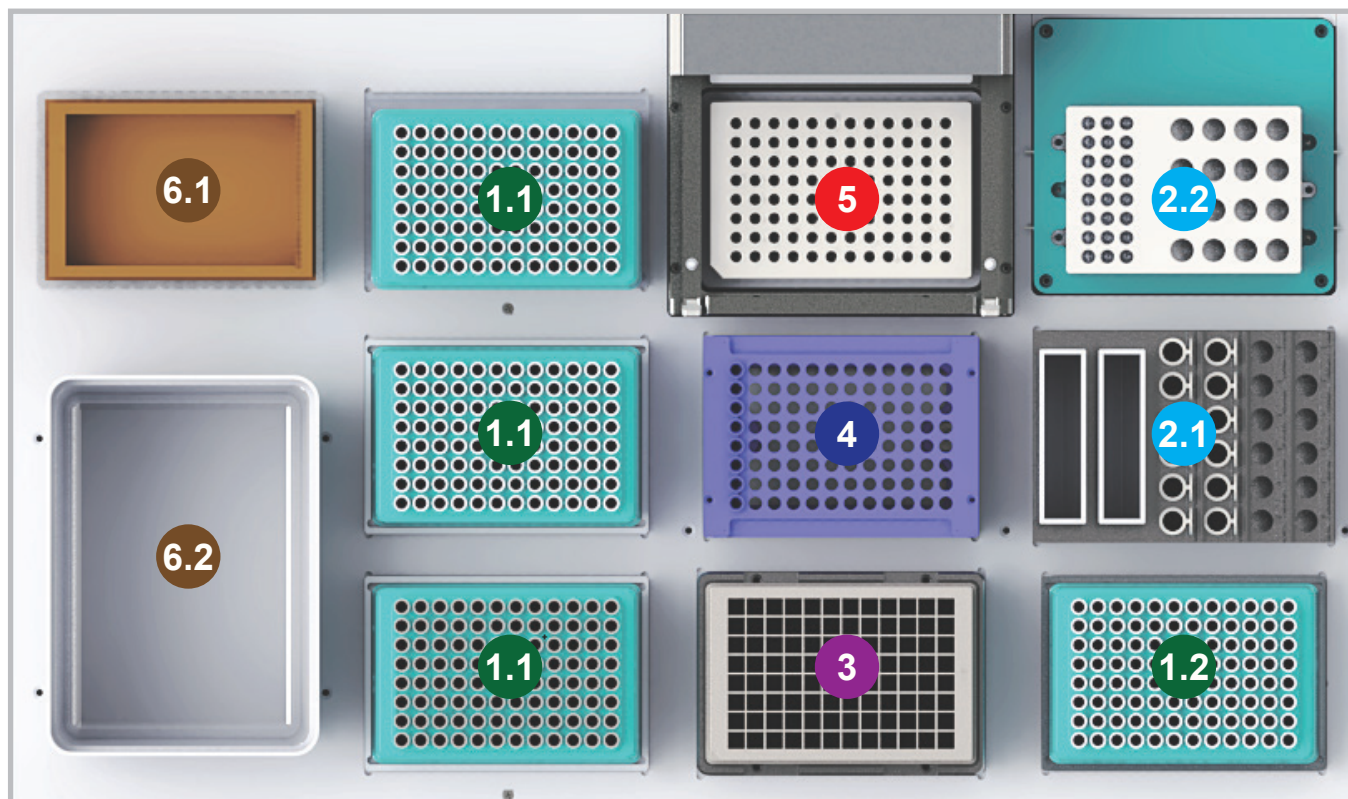
1 TIP Area

1.1 200 μL / 50 μL / 20 μL TIP holders;

1.2 Three specifications of TIP can be combined into one plate for single channel pipetting;

Automatic loading tip mode, saving time and reducing consumption.

3 Magnetic Area

The bottom 96-well magnetic area can closely fit with the 2.0 mL/1.0 mL 96-well plate, and use rising and falling function of the magnetic area to achieve the combination and separation with the magnetic beads.

5 Thermal Cycling Area

It is mainly used for PCR amplification step in the process of library construction, and can be placed PCR consumables such as 96×0.2 mL full-skirted, half-skirted, non-skirted and 8-strip tubes.

2 Reagent Area

2.1 Normal temperature area: 2×60 mL storage tank + 24×2.0 mL centrifuge tube;

2.2 Temperature control area: 3×8×0.2 mL PCR tube + 20×2.0 mL centrifuge tube; temperature control range: 0-105 °C.

4 Sample Area

Equipped with a normal sample rack, which can place 8-strip PCR tubes; the corresponding sample rack can also be selected according to the type of sample tube.
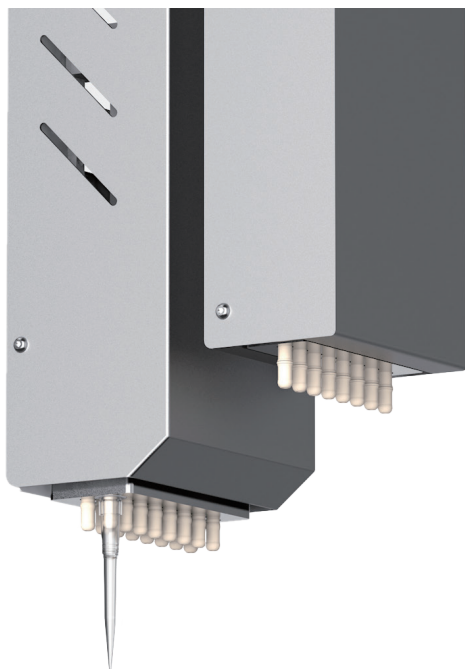
6 Waste Area

6.1 300 mL waste liquid container;

6.2 TIP off box;

Both the waste liquid container and TIP off box are freely accessible.

Special Function Module

Single-channel / 8-channel Pipettor

- 8-channel 1-200 µL fixed spacing pipettor can be used as a single channel to meet the needs of reagent dispensing and pipetting of multiple samples in the same process.

- PLLD / CLLD function, which can sensitively detect liquid level, residual liquid volume and blockage to ensure precise control of pipetting process; equipped with the software related reminder function to ensure that there will be no abnormal experimental results due to insufficient liquid volume during the library construction.

Pipetting range	Pipetting precision	Pipetting accuracy
1 - 200 µL	1 µL: ≤ 5 %	1 µL: ±12 %
	2 µL: ≤ 5 %	2 µL: ±12 %
	5 µL: ≤4 %	5 µL: ±8 %
	20 µL: ≤2 %	20 µL: ±2 %
	100 µL: ≤ 1 %	100 µL: ±1 %
	200 µL: ≤ 1 %	200 µL: ±1 %

Temperature Control Module

Can be freely set at 0-105 °C, the reagent temperature control module of Auto-NGS 100R: can place 3×8×0.2 mL PCR tube + 20×2.0 mL centrifuge tube; various requirements can be realized by changing the module adapter according to the purpose of the module.

Temperature accuracy: 0.5 °C, @55 °C

Temperature uniformity: 0.5 °C, @55 °C
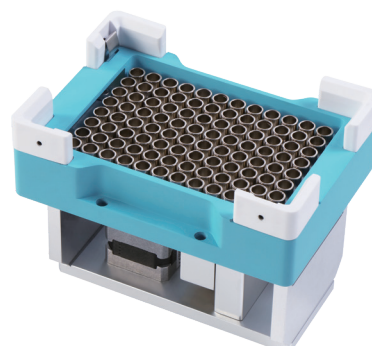
Magnetic Plate Module

The magnetic plate module with freely adjustable height can be used for magnetic bead separation of various plates by cooperation with software.

Thermal Cycling Module

Auto-NGS 100R is equipped with a built-in thermal cycling module, which can cooperate with the software to automatically realize amplification int the library construction process.

In order to prevent cross-contamination from affecting the experimental results, you can choose to use a reusable cover plate or a disposable PCR sealing film to seal the PCR plate during the experiment.

|	
Module temperature control range	4 °C~99 °C
Max. temperature of thermo lid	110 °C
Max. heating rate	4.5 °C/s
Max. cooling rate	4.5 °C/s
Temperature precision	±0.3°C @55°C
Temperature accuracy	≤ ±0.2°C @55°C
Temperature uniformity	±0.2°C (@55°C, 72°C, 95°C)
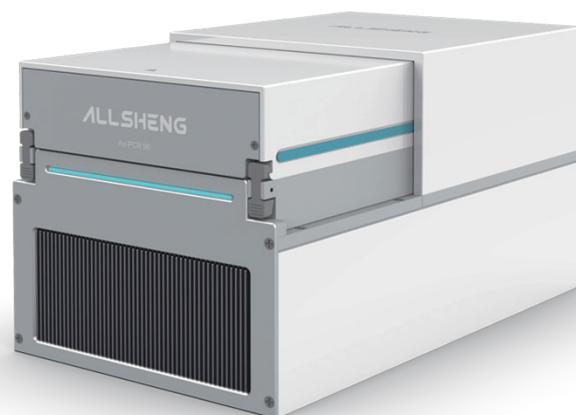
▍ Software

In order to facilitate the use of Auto-NGS 100R, our R&D team can customize the design according to the needs of customers for common NGS library construction methods. Simple and intuitive GUI ensures that you can quickly run the library construction program after the system is installed and makes the software convenient to help you create and run the automated liquid handling protocols.
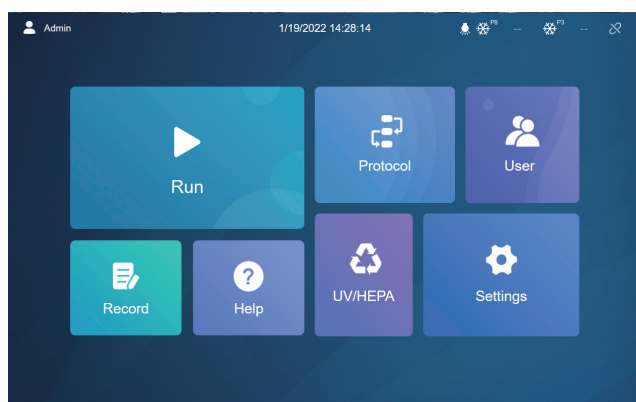
Main Page

The main page has a simple layout, which is convenient, reasonable and easy to be understood.
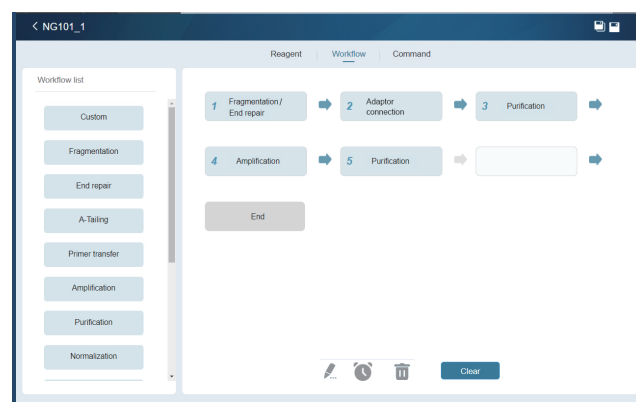
Program Interface

The program settings are open and flexible. Different processes such as reagent transfer, sample transfer and PCR can be set up according to different kits to meet the needs of different experimental steps.

Specification

Instrument Specification

Model	Auto-NGS 100R					
Throughput	1-24					
Tiles number	9 standard tiles + (TIP off box + waste liquid area)					
Available well plate	SBS standard 24/96/384 deep and shallow well plates					
Consumable	Matching Allsheng TIP					
Magnetic plate	96-well annular magnetic plate					
UV sterilization	Equipped with UV sterilization lamp, high-efficiency purification filter device					
Instrument port	USB port, CAN communication					
Ambient condition	Temperature requirement: 10~40 °C, humidity: ≤80 %					
Power input	100~240 V, 50~60 Hz, power 300 W					
Dimension (W×D×H)	740×630×670 mm					
Pipettor / Pipettor type	8-channel fixed spacing pipettors, can be used as a single channel					
Pipettor / Pipetting principle	Air displacement pipetting technology					
Pipettor / Pipetting range	1-200 µL					
Pipettor / Precision(CV)	1 µL: ≤5 %	2 µL: ≤5 %	5 µL: ≤4 %	20 µL: ≤2 %	100 µL: ≤1 %	200 µL: ≤1 %
Pipettor / Accuracy	1 µL: ±12 %	2 µL: ±12 %	5 µL: ±8 %	20 µL: ±2 %	100 µL: ±1 %	200 µL: ±1 %
Temperature control module	The reagent area is equipped with a temperature control module; temperature control range: 0~105 °C, temperature accuracy: 0.5 °C @ 55 °C, temperature uniformity: 0.5 °C @ 55 °C					

Thermal Cycling Module Specification

|			
Applicable consumables	96 PCR plate	Module temperature control accuracy	±0.1 °C
Application scenarios	For independent PCR experiment or liquid handling workstation	Temperature uniformity	±0.3 °C @55 °C
Temperature control range	Thermo lid: +30 °C~+120 °C	Temperature duration accuracy	±5%
	Module: +4 °C~+99 °C	Power supply	AC100-240 V 50-60 HZ Max. 600 W
Default use temperature of thermo lid	110 °C	Thermo lid cleaning	The thermo lid can be flipped for easy cleaning and disinfection
Average heating rate	Module 50 °C~90 °C: ≥2.8 °C/s	4 °C heat preservation	Unlimited
Max. heating rate	Module 50 °C~90 °C: ≥4.5 °C/s	Communication port	CAN
Average cooling rate	Module 90 °C~50 °C: ≥2.2 °C/s	Control software	When connecting to the workstation, it can be controlled by workstation; When used alone, it can be controlled by APP
Max. cooling rate	Module 90 °C~50 °C: ≥4.5 °C/s	Dimension	162×280×160 mm
Temperature accuracy	±0.2 °C	Weight	<10 kg

Accessories Selection Guide

● **Au-Magnet 100 Magnetic Plate for Workstation (96 Deepwell Plate)**
Au-Magnet 200 Magnetic Plate for Workstation (96 PCR Plate)

Code: AS-27021-06   Au-Magnet 100
Code: AS-27021-07   Au-Magnet 200
Function introduction: this system usually uses magnetic bead adsorption based on 96 deepwell plate
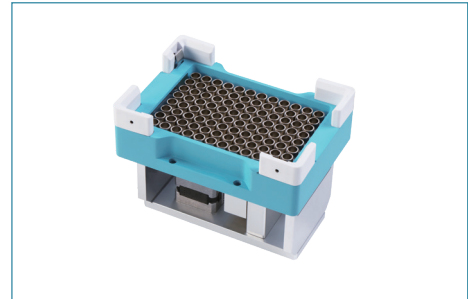
● **Au-Cooler Dry Bath Incubator for Workstation (Heating and Cooling)**

Code: AS-27021-08
Function introduction: adapt to the needs of high temperature and low temperature incubation during the preparation process
Performance parameters: temperature range: 0~105 °C, temperature accuracy: 0.5 °C, @55 °C, temperature uniformity: 0.5 °C, @55 °C
Optional modules: can be customized according to requirements

● **TIP Off Box**

Code: AS-27021-01
Function introduction: used to place consumables consumed during the experiment. Need to put on a plastic bag before use
Dimension (W×D×H) mm: 129×180×140

● **Standard Tray**

Code: AS-27021-02
Function introduction: standard height plate for consumables
Adapted consumables: place SBS consumables, including tips, deepwell plate and PCR plate

● Heightened Tray

Code: AS-27021-03

Function introduction: higher than the standard height plate. The slightly higher design can avoid the interference caused when the 8-channel pipettor is used as a single channel.

Adapted consumables: place SBS consumables, including tips, deep-well plate and PCR plate

● PCR Tube Holder

Code: AS-27021-04

Function introduction: 8-strip tube adapter

Adapted consumables: 8-strip PCR tube and non-skirted 96-well PCR plate

● Reagent Rack

Code: AS-27021-05

Function introduction: store reagents at room temperature

Adapted consumables: place 60 mL reservoir and 12×2 mL / 1.5 mL tubes

● 200 μL SBS Tips

Code: AS-TTF-200-NS / AS-TTF-200-NSL

Remark: maximum pipetting volume 200 μL

● 60 mL Reagent Tank

Code: AS-RT-60-N

Remark: transparent and sterile

Ordering Information

Instrument Ordering Information

Code	Description
AS-27030-00	Auto-NGS 100R automated NGS library preparation workstation, 100-24 V AC, 300 W
AS-27021-01	TIP off box (recommended to store less than 700 pcs)
AS-27021-02	Standard tray (standard height plate for SBS consumables, such as ALLSHENG boxed TIPs)
AS-27021-03	Heightened tray (higher than the standard tray for SBS consumables, such as ALLSHENG boxed TIPs)
AS-27021-04	PCR tube holder (8-strip PCR tube, non-skirted 96-well PCR plate)
AS-27021-05	Reagent rack (place 60 mL reservoir and 12×2 mL / 1.5 mL tubes)
AS-27021-06	Au-Magnet 100 magnetic plate for workstation (96 deepwell plate), 24 V DC, 10 W, with CAN
AS-27021-07	Au-Magnet 200 magnetic plate for workstation (96 PCR plate), 24 V DC, 10 W, with CAN
AS-23010-00	Au-Cooler dry bath incubator for workstation (heating and cooling type), 24 V DC, 160 W, with CAN

Consumables

Code	Description	Remarks
AS-22012-201	1.6 mL 96-well U deepwell plate	--
AS-22012-202	2.0 mL 96-well U deepwell plate	--
AS-22012-203	96 V bottom reservoir	--
AS-RT-60-N	Disposable 60 mL reagent tank, PP material, transparent and sterile	20 pcs/bag, 10 bags/carton

TIP Consumables

Code	Volume	Description	Packing
AS-TT-200-N	200 µL	Allsheng tip, transparent, boxed	
AS-TT-200-NL	200 µL	Allsheng tip, transparent, boxed, low adsorption	
AS-TT-200-NS	200 µL	Allsheng tip, transparent, boxed, sterile	
AS-TT-200-NSL	200 µL	Allsheng tip, transparent, boxed, sterile, low adsorption	
AS-TTF-200-NS	200 µL	Allsheng tip, transparent, boxed, sterile, filter element	
AS-TTF-200-NSL	200 µL	Allsheng tip, transparent, boxed, sterile, filter element, low adsorption	96 pcs/box
AS-TT-50-N	50 µL	Allsheng tip, transparent, boxed	24 boxes/carton
AS-TT-50-NL	50 µL	Allsheng tip, transparent, boxed, low adsorption	
AS-TT-50-NS	50 µL	Allsheng tip, transparent, boxed, sterile	
AS-TT-50-NSL	50 µL	Allsheng tip, transparent, boxed, sterile, low adsorption	
AS-TTF-50-NS	50 µL	Allsheng tip, transparent, boxed, sterile, filter element	
AS-TTF-50-NSL	50 µL	Allsheng tip, transparent, boxed, sterile, filter element, low adsorption	