

# LNS Series Liquid Nitrogen Generator

Liquid Nitrogen Output 10~300 liters/day





## LNS Series High Purity Liquid Nitrogen Generators

The "LNS Series" are the latest liquid nitrogen generator under brand SCALA. Integrated design with built-in air source, nitrogen source, cryo-cooler and dewar tank, the units can produce HIGH purity liquid nitrogen automatically via easy operations through touch screen.

Based on PSA (Pressure Swing Adsorption)  $N_2$  generation technology and hybrid Stirling or Gifford-McMahon (GM) cryocoolers pre-installed on top of the dewar tanks, LNS series  $LN_2$  generators reduce the footprint, eliminate nitrogen emission, lower energy consumption and improve safety in labs.

## Redefines " $LN_2$ Generators"

We constantly improve product performance and enhance user experience with years of practice. SCALA brand  $LN_2$  generators are powered by Siemens PLC and industrial grade electrical systems which ensures long service time; intelligent liquid level gauge allows automatic running; WiFi & 4G functions bring remote control and diagnoses; modular structure provides minimal and convenient maintenance which is very important for oversea users.

All LNS series are installed with 10" HMI that displays all parameters necessary such as temperature, pressure,  $LN_2$  level,  $LN_2$  output etc. for easy operation, customized settings and easy trouble shooting

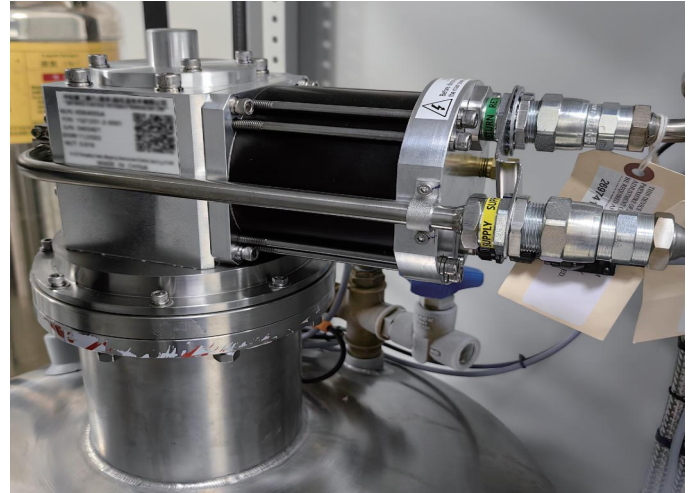
Temp. Display

Pressure Display

$LN_2$  Level

$LN_2$  Output

## 1 Reliable Cryocooler



We apply the cutting-edge hybrid Stirling cryocoolers and GM cryocoolers in scientific researching to make on-site liquid nitrogen happen. With decades of using experience and EU, CE & American UL certification, GM cryocoolers have been proved reliable and safety throughout the world.

## 2 Large Built-in Dewar



Most LN<sub>2</sub> generator manufacturers only tuck in very small dewar tank to cast costs which cannot meet users' real needs.

All SCALA brand LN<sub>2</sub> generators are equipped with **Built-in** super large dewar that can meet most using scenarios without external LN<sub>2</sub> tanks.

## 3 Smart LN<sub>2</sub> Level Cont



Reliable capacitive digital level gauge, decades using experience, enables our LN<sub>2</sub> generator auto running and auto stand by.

The settable LN<sub>2</sub> ratio on HMI for auto start and auto stands by means you always have enough LN<sub>2</sub> anytime.



## 4 High Purity LN<sub>2</sub>



Built-in PSA N<sub>2</sub> generator with analyzer makes 99.7%–99.995% high purity LN<sub>2</sub>.

High-strength non-weld alu adsorption tower with max 16 bar working pressure eliminates N<sub>2</sub> contamination and reducing leakage.

UHP CMS adsorbent, long service span.

## 6 Pilot Solenoid Valves



The independent four-way valves increase times efficiency to ensure long-term trouble-free operation.

Pilot solenoid valve used for drainage has service life more than 1,000,000 times.

The valve, with CE & UL certification, and a switch with a suppressor extends logher service life.

## 5 Ultra Clean LN<sub>2</sub>



All models pre-installed with dust removal filters with removal precision < 0.01 μm, only clean N<sub>2</sub> will be liquefied.

High standard sterilization filters are optional to ensure sterile N<sub>2</sub> before liquefaction for specific field or requirements.

## 7 Oil-free Air Compressor



Built-in high performance GAST or THOMAS oilfree air compressor, CE & UL certified, complies with global regulations and longer working time.

Double cooling fans beside the compressor further extend the service life.

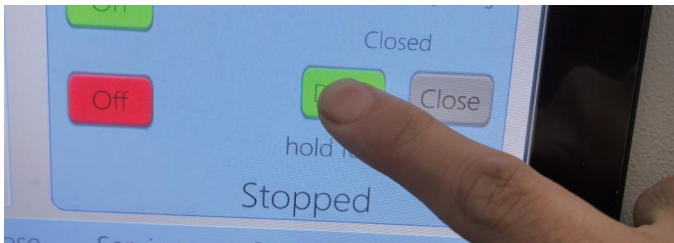
## 8 Touch Screen to Dispense LN<sub>2</sub>



Most generators in the market adopts manually turning the stop valve to dispense LN<sub>2</sub>. The stop valve is easily frozen after first dispense and you have to wait for at least 15 minutes for another dispense.

LNS series equip with ultra low temperature solenoid outlet. Saves the process of turning off machine or pressure building, press the touch screen for easy and controllable LN<sub>2</sub> dispensing experience.

Dispensing duration also settable. The dispensing stops automatically when time is up.



### Operatable with Gloves

Thick protective gloves are required for LN<sub>2</sub> dispense. We specially selecte touch screen with resistive touch technology & its sensitivity won't reduce due to water droplets or oil stains, which is convenient for users to operate.

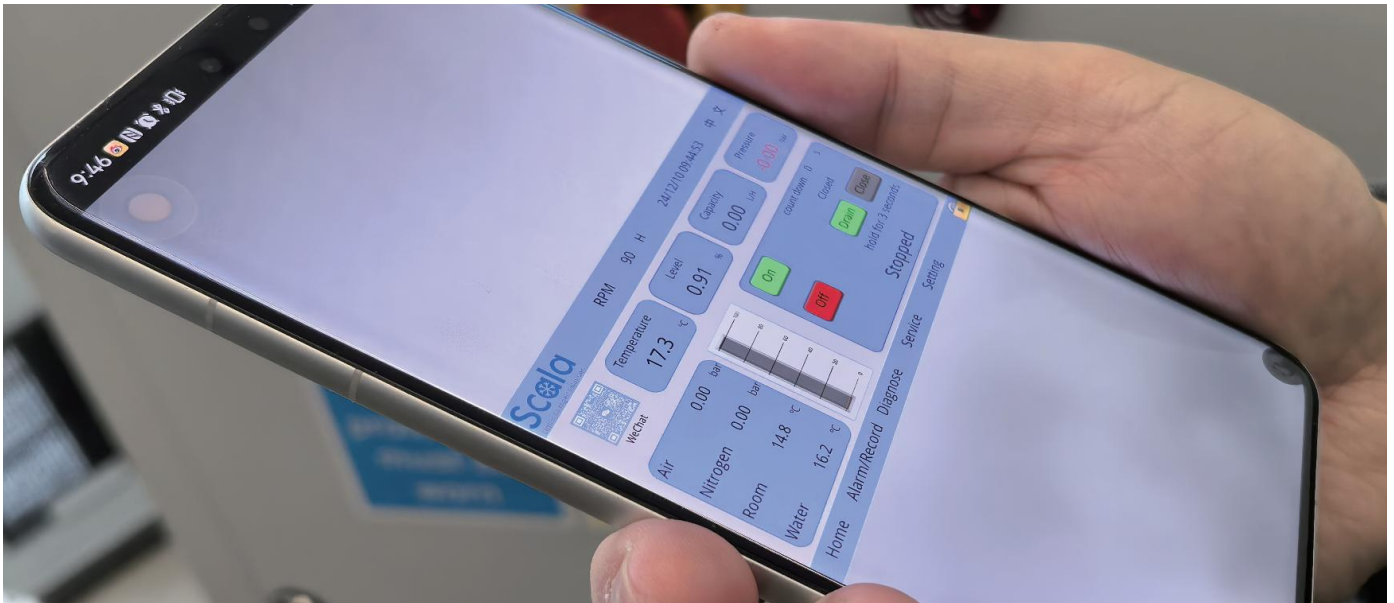
## 9 Industrial-grade Electrical System



LNS series use PLC controllers, solid state relays, and world-class electrical components for a longer service life.

All models are additionally equipped with physical switches, emergency stops, and buzzer alarms to meet the needs of users in different industries and countries.

## 10 Weincloud Monitor for Reliability



### Monitor Upgrading Alarming Diagnosing

Equipped with Weinview WiFi module, CMT Viewer and EasyAccess 2.0 exclusive remote connection, eliminate firewall or router settings, obtain the remote connection service in 5 minutes to do remote monitoring and maintenance any time any where. You can also choose the most suitable monitoring mode among cMT Viewer mobile device monitoring, WebView web monitoring, and VNC Viewer.

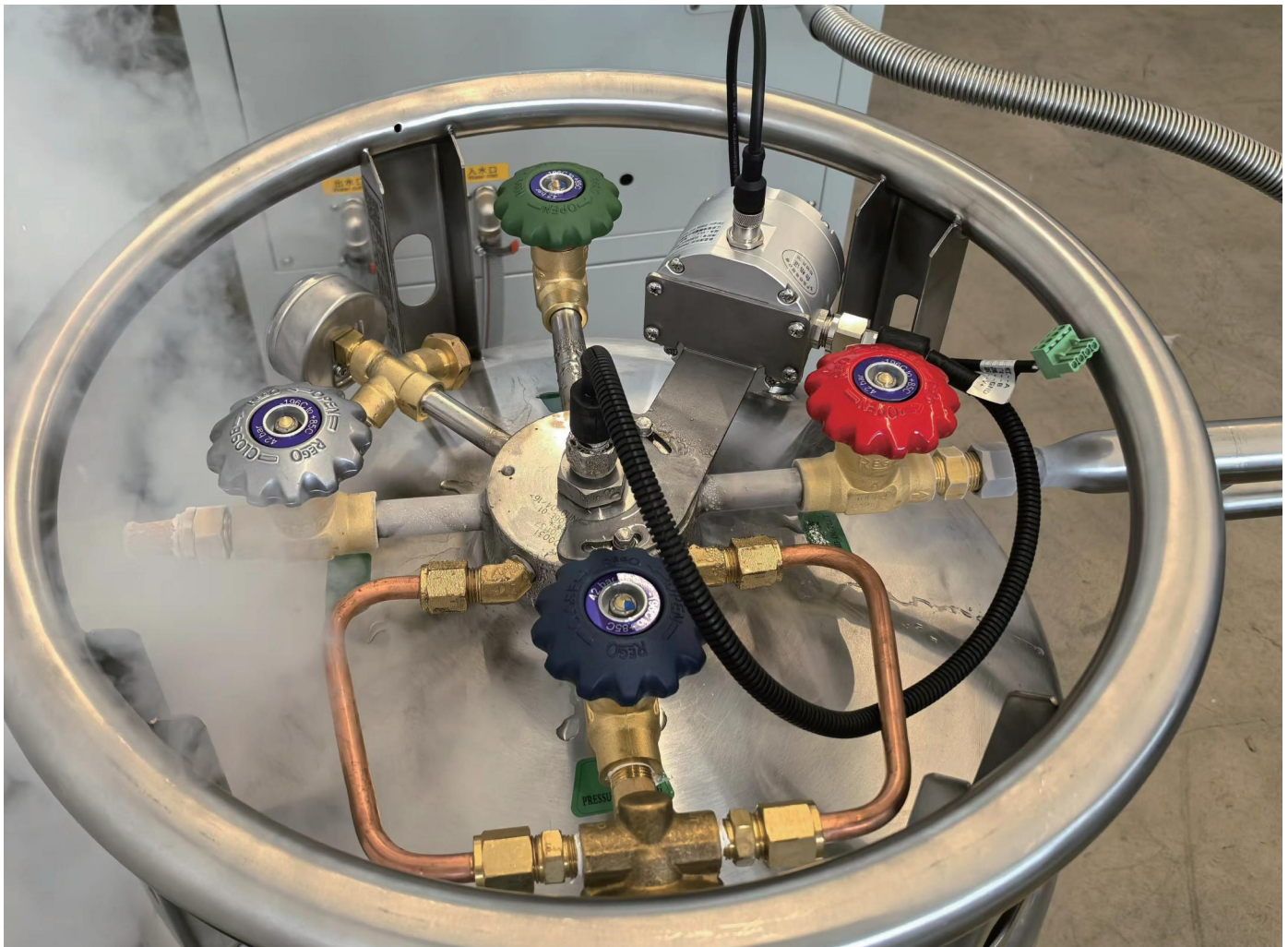
## 4G IoT Expansion Module



- ✓ **三大移动运营商**  
中国移动、中国电信、中国联通
- ✓ **4G物联网卡**  
标准尺寸 (Mini SIM)

When there is no WiFi available, users can use the 4G IoT expansion module to connect the machine to improve work efficiency and productivity.

## 11 Replenish External LN<sub>2</sub> Tanks



**Certified by national supervision and inspection agency, TS steel seal, transportable on trucks and rechargeable at gas station.**

When liquid nitrogen is used less frequently, or more liquid nitrogen is needed in a short period of time, we recommend our liquid nitrogen tank for period storage

Our liquid nitrogen liquid nitrogen tank equipped with digital level gauge, and it can be directly connected to the liquid nitrogen generator through RS485 communication, and can be customized to automatic dispense to the external tank.



## Smaller Size

SCALA LNS Series LN<sub>2</sub> generator is our reliable and efficient plug-and-play solution for LN<sub>2</sub>. Small footprint is the most intuitive feeling.

The all-in-one design significantly reduces the installation space compared to products that need external air source or external liquid nitrogen tank.

## Lower Noise

Built-in low-noise oil-free air compressor & low-vibration water chiller, strengthening shock absorption and sound insulation further reduce noise. The sound is **less than 60dBA** @1 meters distance. You cannot even feel it's working in your laboratory.

## Less Power

SCALA brand LN<sub>2</sub> generators eliminate nitrogen emissions and 100% N<sub>2</sub> is liquefied, so only small size compressor and N<sub>2</sub> generator are needed.

The smart liquid level gauge enables our machine **automatic stands by** to save energy further lowers its power consumption.

## Longer Service

High-performance air compressor and cooling fans can work continuously over 8,000~16,000 hours.

PSA N<sub>2</sub> generation adopting UHP ultra-high purity carbon molecular sieve, the service life is 5-10 years.

Top brand components and robust PLC controller ensure the whole system run in best condition.

## Easier Maintenance

We split the complex structure to multiple small modules for easy maintenance & convenient replacement.

Maintenance can be done by yourself to replace maintenance kits provided by us.

Fewer welded parts reduces corrosion or leakage.



# Specifications

Model	LNS10A	LNS20W	LNS20A	LNS25A
LN <sub>2</sub> Output (> L/D)	10	20	20	25
Built-in Dewar (L)	35	50	50	100
LN <sub>2</sub> Purity	> 99.95%	> 99.5%	> 99.5%	> 99.5%
LN <sub>2</sub> Pressure (Max)	1 bar	1.5 bar	1.5 bar	3 bar
Noise (@1 meter)	< 60 dB(A)	< 58 dB(A)	< 60 dB(A)	< 60 dB(A)
Power (Kw)	2.2	2.8	3.9	4.1
Electricity Supply	230V/1PH/ 50HZ	230V/1PH/ 50HZ	230V/1PH/ 50HZ	230V/1PH/ 50HZ
Cool Type	Air-cooled	Water-cooled	Air-cooled	Air-cooled
Cooling Water	N/A	> 20L/min	N/A	N/A
Length (cm)	80	90	130	130
Width (cm)	65	75	65	65
Height (cm)	170	170	175	175
Weight (Kg)	270	370	450	500

Model	LNS50W	LNS100W	LNS200W	LNS 300W
LN <sub>2</sub> Output (> L/D)	50	100	200	300
Built-in Dewar (L)	200	300	500	1000
LN <sub>2</sub> Purity	> 99.5%	> 99.5%	> 99.5%	> 99.5%
LN <sub>2</sub> Pressure (Max)	3 bar	3 bar	3 bar	3 bar
Noise (@1 meter)	< 65 dB(A)	< 65 dB(A)	< 65 dB(A)	< 65 dB(A)
Power (Kw)	7.3	7	14	21
Electricity Supply	380V-3PH-50HZ	380V-3PH-50HZ	380V-3PH-50HZ	380V-3PH-50HZ
Cooling Water	> 20L/min	> 50L/min	> 100L/min	> 200L/min
Length (cm)	160	200	200	300
Width (cm)	80	200	200	200
Height (cm)	175	175	180	180
Weight (Kg)	600	1100	1400	1800
Compressed Air (Nm <sup>3</sup> /H , 7 barg)	NA	13	26	39

## Notes :

1. LN<sub>2</sub> output based on temperature 25°C, air pressure 101.325 kPa.
2. Standard altitude: 3,000m; higher altitudes may affect LN<sub>2</sub> purity and output.
3. Ambient temperature: 5-32°C; high ambient temperatures may affect LN<sub>2</sub> output.

## 12 Optimal & Customized Solutions

Scala focuses on the scientific research laboratory market. Our products are widely used in cryostorage, NMR, low-temperature superconductivity, cryo-EM, astronomical observatories and other fields that require on site liquid nitrogen.

Scala offers both standard and customized solutions for LN<sub>2</sub> generation. For example, high-altitude areas, special voltages, downstream instruments LN<sub>2</sub> control, and automatic LN<sub>2</sub> replenish to external LN<sub>2</sub> tank.



**LN<sub>2</sub> Storage 50% Higher Than National Standard**

**JOTUN** Paint Finish

**Non-toxic Guarantee**

**Long-term Reliability**

## Transportation LN<sub>2</sub> Tanks (YDS-B)

Model	容积 Volumn (L)	外径 Outer Diameter (mm)	口径 Opening Width (mm)	总高度 Height (mm)	空重 Net Weight (kg)	静态蒸发率 NER (L/Day)	静态保存期 Static Retention Period (Day)	圆提桶数量 QTY of Round Canister (Pcs)	方提桶数量 QTY of Square Canister (Pcs)
YDS-20B	20	379	50	650	10.6	0.20	101	6	-
YDS-30B	31.5	449	50	698	14.1	0.20	159	6	-
YDS-35B	35.5	449	50	708	14.3	0.20	179	6	-
YDS-50B	50	522	50	770	22.8	0.24	209	6	-
YDS-30B-80	31.5	449	80	707	14.3	0.30	106	6	-
YDS-35B-80	35.5	449	80	717	14.6	0.30	119	6	-
YDS-35B-127	35.5	449	127	722	15.7	0.43	82	6	6
YDS-50B-80	50	522	80	770	23.2	0.34	147	6	-
YDS-50B-127	50	522	127	779	23.8	0.48	105	6	6

Designed for long-term storage of medical samples at -196°C liquid nitrogen environment.

1. High vacuum, high thermal insulation, ultra-low LN<sub>2</sub> loss, 50% higher than national standard;
2. Convenient operation experience, 2mm wider opening for smoother storage and take out;
3. Aviation-grade aluminum shell, solid and sturdy protection;
4. Norway brand Jotun paint finish, non-toxic and long-term reliability guarantee.



## LN<sub>2</sub> Replenish Tanks-Laboratory Series

- Designed for medical centers and labs, elegant and easy mobility
- Low LN<sub>2</sub> loss and wide pressure suitability (12Psi ~120Psi)
- Digital display level gauge, LN<sub>2</sub> storage volumn in real time

1. Industrial design oriented to medical equipment, convenient to use in clean environment;
2. Ultra-quiet design, high-efficiency silencer & casters to ensure maximum 70db noise;
3. Light weight cylinder with high flexibility casters, female friendly operation;
4. Certified by national supervision and inspection agency, TS steel seal, transportable on trucks.



Model	Volumn (L)	Storage (L)	Dia. (mm)	Height (mm)	Weight (kg)	Pressure (Psi)	Safety (Psi)	Evapor (L/d)	Max LN <sub>2</sub> (kg)
DPL 400-35	35	32	454	958	39	12-120	15-150	≅ 1.1	25.6
DPL 400-55	55	50	454	1000	45	12-120	15-150	≅ 1.2	40
DPL 450-110	110	100	508	1270	90	12-120	15-150	≅ 1.5	80



## Movable LN<sub>2</sub> Supply Cylinder

Specially designed for safe storage and transfer of low-pressure LN<sub>2</sub> and supply LN<sub>2</sub> to other applications.

1. High-strength lightweight stainless steel, convenient transportation and high safety;
2. Excellent insulation performance, high-efficiency vacuum insulation coating technology, which can effectively reduce the loss of liquid nitrogen;
3. High safety design, easy handle accidents such as impact, fall, and dumping;
4. User friendly design, standard digital display level gauge, easy to use;
5. Excellent suppliers combined with advanced manufacturing technology, quality guaranteed.

### Specifications

Model	YDZ-						
	30	50	100	200	230	300	500
Geometric Volumn (L)	32	55	110	220	240	330	530
Effective Volumn (L)	30	50	100	200	230	300	500
NER (%/Day)	2.5	2.2	1.4	1.2	1.5	1.0	1.0
NEC (L/Day)	0.75	1	1.3	2.4	3	3.3	5
RV I (Mpa)	0.099	0.099	0.099	0.099	0.15	0.099	0.099
RV II (Mpa)	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Working Pressure (Mpa)	0.05	0.05	0.05	0.05	0.09	0.05	0.05
Max Working Pressure (Mpa)	0.09	0.09	0.09	0.09	0.14	0.09	0.09
Diameter (mm)	405	455	556	656	610	806	958
Helght (mm)	900	1010	1150	1350	1516	1450	1550
Net Weight (kg)	45	54	72	127	145	210	268
Flow (L/min)	4	5	5	10	15	15	15



## LN<sub>2</sub> Tower & Vacuum Tube

1. Stainless steel outer container, suitable for harsh working conditions;
2. User friendly designed system, simple operation and easy maintenance;
3. High-precision liquid level gauge, accurate indication with remote transmission for online monitoring;
4. Better thermal insulation performance than GB standard, ultra-low LN<sub>2</sub> loss & cost reducing;
5. Applicable to both tank carrier for refilling and fast zero-loss auto refilling vehicles;
6. Excellent suppliers combined with advanced manufacturing technology ensure safety & low failure rate.

## Specifications

Model		1C	2C	3C	5C
Geometric Volumn (m3)		1.05	2.11	3.00	4.99
Design Pressure (Mpa/Psi)		1.6/230			
Max Filling Rate (%)		95			
Effective Volumn (m3)		1	2	2.85	4.74
Dimensions (mm)	L	1392	1650	1700	2100
	W	1619	1873	1850	2250
	H	2225	2826	3125	3375
Net Weight (kg)		910	1340	1490	2270
Net Evaporation Rate (%/Day)		0.985	0.696	0.660	0.450
Liquid Level Display		Intelligent Digital Display			

Hangzhou Scala Filtration Technology Co., Ltd. was founded in 2013, focusing on the R&D, production and sales of compressed air purification and gas equipment.

In traditional laboratory scenario, the use of bottled liquid nitrogen has many drawbacks. The continuous rise of cost, safety hazards in transportation and storage have always been a problem for users. The application of on-site liquid nitrogen generators has won wide recognition in the world in terms of reliability & economy. Extracting LN<sub>2</sub> directly from the air eliminates the trouble of purchasing and opens more opportunity.

Since the first sale of the an imported LN<sub>2</sub> generator in 2017, Scala has always been guided by user needs and has carried out in-depth improvements and reshaping of the "liquid nitrogen generator". SCALA's LN<sub>2</sub> generators apot self-developed PSA N<sub>2</sub> production tech and integrate cryogenic technology with LN<sub>2</sub> output ranging from 10 to 300 liters/day, purity as high as 99.5% - 99.999%. With the help of IoT technology, the generators are safe & reliable, intelligent & economical. Scala's products are widely used in labs equipment and medical institutions for sample storage, NMR spectroscopy, cryo-EM, superconductivity, astronomical observations, aerospace and many other fields that require small amounts of liquid nitrogen.

Scala has built a professional after-sales service team. With efficient and fast service and market reputation, we have now developed into a leading manufacturer and service provider of LN<sub>2</sub> generators in China. Dozens of LN<sub>2</sub> generators have been operating stably all over the country, from the vastness of the Tarim Basin in Xinjiang to the majestic Qinghai-Tibet Plateau, from the silence and mystery uninhabited area of Qinghai to the vast blue waves of the South China Sea. With excellent performance and meticulous after-sales service, Scala has been exported our LN<sub>2</sub> generators to many countries and regions as Brazil, Cuba, the United States, Barbados, the Marshall Islands, Uruguay, Mongolia, etc.



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