

Multiplelabs
Turnkey Laboratories Solutions

GC-9786

Gas Chromatography



GC-9786 network-based series Gas Chromatography

GC-9786 network-based series Gas Chromatograph Plus, A, B, E, T, N and Micro (portable and onboard series) are available.

The instruments fully absorb advanced technology abroad of the same kind of products, adopt domestic industrial leading manufacturing technology and process, and ensure instrument reliability and non-failure operation time. It maximizes normal operation, reduces maintenance, and makes structure simple, proper, and easy to learn and operate.

It has unique remote network transmission and control function and achieved duty-free, decentralized monitoring and centralized control; the data analysis results are input into DCS to finish statistics, analysis, monitoring of the chromatograph group and improve automation of production process.

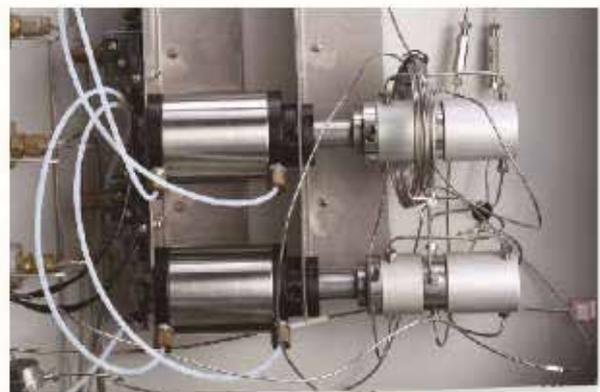
It is extensively used in petroleum and chemical industry, fine chemical engineering, biological pharmaceutical industry, environmental protection, food health, high purity gas, electricity, wine brewing, scientific research, education and other analyzing fields.

All sample injection port and detector gas circuits of the GC-9786 Plus and B series gas chromatograph are controlled with electronic gas circuit (EPC) to provide better retaining time and peak area precision and provide industrial users with the industrial leading excellent quality and trust results. The instrument user sets gas flow rates, external events, temperatures, detectors, instruments and other parameters with the anti-control software, and saves all parameters of the analyzing approach. Digital circuit makes setting values the same in each operation and by different operators. Therefore, users can obtain better retaining time recurrence and more trustable and consistent results, half the work with double results.

The instrument can be configured with automatic liquid sample injector and anti-control software to control parameters, which yield better repeatability and increase operation efficiency, and eliminate errors caused by manual sampling.



Customized valve system



Central cutting system

Excellent Solution:

1. Analysis of gas in power transformer oil (GB/T 17623-1998, DL/T 722-2000, DL/T 703-1999)
2. Gas chromatography analysis of safety gas under coal mine (24h uninterrupted cycling sampling and analyzing for 32 points)
3. Analysis of air quality (TVOC, benzene, total hydrocarbon and non-methane total hydrocarbon) (satisfying GB/T50325-2001, GB/T18883-2002 and GB16927-1996); 24h uninterrupted online analysis of workshop tail gas, flute gas, and VOC in smoke, benzene and non-methane total hydrocarbon)
4. Water quality analysis (satisfying GB/T 5750-2006)
5. Analysis of natural gas, refinery plant, cracking gas and manual coal gas and other industrial gases (simple single-valve type, broad spectrum process double-valve and four-column economic type, broad spectrum three-valve and four-column practical type, broad spectrum five-valve and six-column high-end type, three-valve and four-column TCD type, four-valve and five-column double TCD models etc.; satisfying GB/T13610-2003, UOP539, ASTM1945, ASTM D1946 and GPA2261; specially customized subject to users' samples)
6. Analysis of coal gas and marsh gas (H₂, O₂, N₂, CH₄, CO and CO₂ compositions, change of unique single-valve sequence)
7. Sulfides in the natural gas (back flushing for change of the unique single-valve sequence, testing H₂S, CSO, S₂ and total sulfide)
8. Analysis of high purity gas, electronic industrial gas (minimum testing concentration up to 10ppb and above)
9. Analysis of benzene and methylbenzene in petroleum (satisfying ASTM D3606; SH/T 0713-2002)
10. Analysis of oxygenated chemicals in petroleum (satisfying AZTM D4815 and SH/T 0663-1998)
11. Analysis of benzene, methylbenzene and aromatic hydrocarbon (satisfying ASTM D5580-1995, SH/T 0693-2000)
12. SOA analysis of hydrocarbon group in petroleum, PONA analysis of single hydrocarbon in petroleum (content testing of saturated hydrocarbon, olefin, aromatic hydrocarbon and benzene, special olefin adsorption trap is used; satisfying SH/T 0741-2004)
13. Simulating distilled gas chromatography (satisfying SH/T 0558, ASTM D5307, D3710, D6352 and D2887)
14. Blood alcohol analysis (satisfying the standard of the Ministry of Public Security GA/T 105-1995)
15. Cigarette VOC (satisfying YC/T 207-2006), chemical residue analysis, ethylene oxide in medical apparatus (satisfying GB/T 16886.7-2001) and solvent residue testing in packing materials
16. Special gas chromatography for greenhouse gas (CO₂, CH₄ and N₂O, 0.1ppm-100%)
17. Online analyzing system of catalytic review, high pressure and high temperature (the system spectrum customized based on requirements)
18. Process gas chromatograph instrument (industrial chromatograph), sample pre-treatment, analyzing house building, multi-flow sample selection (support up to 32 channels of sample selection) etc.

GC-9786Plus/ GC-9786B Gas Chromatograph



GC-9786 Plus



GC-9786B

►► Features and Performance Parameters:

- GC-9786Plus adopts 5.7-inch lattice large-screen LCD display. Color touch screen is optional. GC-9786B chromatograph instrument host adopts high-brightness vacuum fluorescent screen display, fast and simple keyboard operation.
- Optional gas circuit manual control and full automatic electronic gas (EPC), network-based telecommunication (Ethernet interface IEEE802.3) and computer online full automatic control operation.
- Electronic gas circuit EPC control mode:
EPC electronic gas circuit control precision 0.01 mL/min or 0.01 Kpa, guaranteeing better retaining time recurrence and more consistent and reliable results
EPC operation mode: constant flow, voltage and split flow mode
Program pressure control: 4 steps
EPC operating gas: N₂, H₂, Air, He and Ar
EPC control range: pressure 0~0.6Kpa flow 0~100sccm or 0~500sccm
EPC control precision: pressure 0.01Kpa; flow 0.01seem
- Support high-rate temperature increasing, maximum rate of 80°C/min for fast analyzing.
- Temperature is increased to 450°C, suitable for analysis of samples with high boiling points.
- Support double-column box and double rear door opening mode.
- Column box temperature increment of 1°C and precision of ±0.01°C, equivalent to high-end imported products of the same kind of the products.
- 6 channels of external events, 2 channels of auxiliary control output.



High-brightness display and key operation



3-channel electronic gas circuit EPC module

- Diverse sample injection systems; filling column injection, capillary bypass/non-bypass injection, valve injection, automatic liquid injection and full automatic headspace injection, cracking injection, thermal desorption injection and blowing capturing injection are optional.
- The special ordering valve system helps users complete complicated multi-dimensional spectrum analysis task. The Plus model is a multi-purpose gas chromatograph instrument built for multi-dimensional application analysis and online analysis.
- Rich tester types, the Plus type can be installed with 3 testers (type B can be installed with 2 testers simultaneously): TCD, HTCD, uTCD, FID, FPD, ECD, NPD, ZD, PDHID, PID and AID.
- The program supports multi-flow samples to select the MPV system, with functions of automatic identification of quantity of valves, automatic cascading judgment, automatic resetting, valve position selection, valve position analyzing and memory function, and supports up to 32 channels of sample flow selection.
- Unique remote network transmission and control function for duty-free analysis, decentralized monitoring and centralized control.
- Data is input into DCS system via the MODBUS protocol to finish statistics, analysis and monitoring of spectrum composition and improve automation of production process.

- Temperature control :

a) Number of channel of temperature control: 8 channels

b) Column box temperature:

Column box temperature range:

4°C~450°C above room temperature

(increment 1°C)

Column box temperature control precision:

superior to $\pm 0.01^\circ\text{C}$

Column box program temperature increasing:

16-step program increasing

Program temperature increasing rate setting

:

0.1~39°C/min (ordinary)

0.1~80°C/min (High-rate)

Constant temperature time at different steps:

0~999min (increment 0.1 min)

Programmable temperature lowering:

only 6 minutes required from 260°C to 50°C

c) Sampler, detector and thermal conductivity cell:

Temperature range: 4°C~450°C above

room temperature (increment 1)

*Temperature control precision:

superior to $\pm 0.01^\circ\text{C}$



Technical parameters of GC9786 series detectors:

▶▶ 9786-FID Flame ionization detector

- Collection electrode adopts cylinder structure, quartz spout
- Testing limit: $\leq 3 \times 10^{-12}$ g/s (Hexadecane/isooctane)
- Baseline noise: 5×10^{-14} A
- Baseline drifting: $\leq 1 \times 10^{-13}$ A/30min
- Linearity: $\geq 10^7$
- Automatic ignition (tester temperature more than 130°C)

▶▶ 9786-TCD thermal conductivity detector

- Semi-dispersion structure
- Constant current control used for power
- Sensitivity: $S \geq 4000$ mv.ml/mg (Hexadecane/isooctane) HTCD high sensitivity thermal conductivity detector $S \geq 10000$ mv.ml/mg (Hexadecane/ isooctane); numerical amplification of 1, 2, 4, 8 times
- Baseline noise: $\leq 10 \mu\text{v}$
- Baseline drifting: $\leq 30 \mu\text{v}/30\text{min}$
- Linearity: $\geq 10^5$
- Carrier gas rate stability: $\leq 1\%$
- Optional capillary column connecting parts.

▶▶ 9786-ECD Electron capture detector

- Testing limit: $\leq 1 \times 10^{-14}$ g/s
- Linearity scope: 104
- Radioactive source: Ni63

▶▶ 9786-FPD Flame photometric detector

- Testing limit:
 5×10^{-12} g/s (S) (S in parathion-methyl)
 5×10^{-13} g/s (P) (P in parathion-methyl)
- Linearity range: 105 (P) 103 (S)
- Maximum operation temperature: 350°C
- Testing method: air-hydrogen flame power-spectral method
- Optical tester: top optical multiplier tube
- Multiplier voltage: maximum -700V

▶▶ 9786-NPD nitrogen phosphorus detector

- Testing limit: (N) $\leq 5 \times 10^{-12}$ g/s (P) $\leq 5 \times 10^{-12}$ g/s

Excellent Solution:

GC-9786 E is a new generation of gas chromatograph instrument with high stability and high reliability suitable for regular testing requirements. It is configured with advanced electronic flow and electronic pressure measurement monitoring module, and gas parameters can be easily obtained on the host display or the workstation software through the gas regulating button, including flow/pressure of carrier gas, hydrogen and air, and injection port split ratio and column flow, without measurement by flow meter and manual calculation, and operation is convenient.

GC-9786 E gas chromatograph instrument is widely used in petroleum chemical engineering, food safety, environment monitoring, quality inspection, biological chemical engineering, medical sanitation, high purity gas, power, building, wine brewing, scientific research, education and other fields, and is a preferred choice for daily testing.

The machine is installed with 3 injection ports and 3 detectors simultaneously; and the automatic liquid sample injector and specially customized valve system can be easily installed for high-pass analysis.



Features and Performance Parameters:

1. 5.7-inch lattice large-screen LCD display. Color touch screen is optional.
2. Optional gas manual and full automatic gas circuit (EPC), network-based telecommunication (Ethernet IEEE802.3) and computer online full automatic operation

3. Manual gas circuit mode:

Manual gas circuit control pressure and flow display mode:

electronic pressure and flow measurement and display, and the pressure and flow can be displayed in the anti-control software.

Full electronic pressure and flow measurement system: measure 16 channels in maximum

Pressure sensor:

Accuracy: $<\pm 2\%$ of full range

Reoccurrence $<\pm 0.05\text{Kpa}$

Temperature factor $<\pm 0.01\text{Kpa}/^\circ\text{C}$

Range: $0\sim 0.3\text{Kpa}$ or $0\sim 0.6\text{Kpa}$

Temperature sensor:

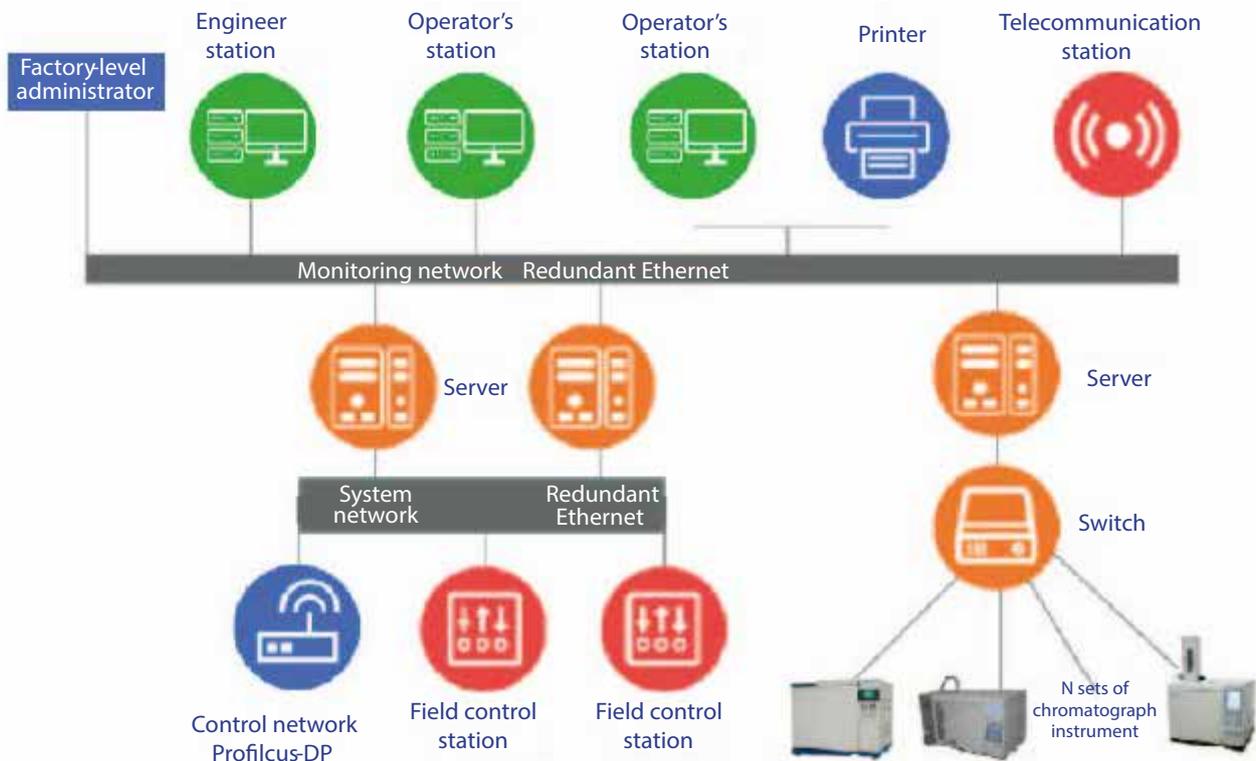
Accuracy: $<\pm 2\%$ of full range

Reoccurrence: $<\pm 0.5\%$ (full range)

Range: $0\sim 500\text{sccm}$

Other parameters are the same as GC-9786Plus

9786 NetChorm network-based anti-control workstation



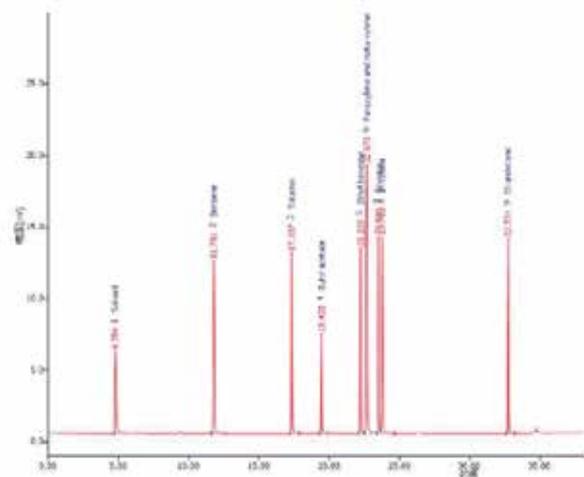
►► Features and functions:

1. Telecommunication mode: network-based telecommunication, IEEE802.3 Ethernet interface; and the workstation supports RS232 telecommunication interface simultaneously;
2. Organic combination of chromatograph data processing and instrument anti-control operation makes convenient operation and friendly interface.
3. The workstation software defines heating zone temperature and heating zone names, and sets and controls enabling switch, gas flow and pressure, programmable pressure increasing control, programmable temperature increasing and external events, automatic feeder, multi-flow sample selection control, tester and other parameters;
4. The workstation supports multi-channel data processing of several sets of chromatograph instrument, supports connection of 5000 sets of chromatograph instrument, single set of chromatograph instrument data support processing of 4-channel signal, the 4th channel is virtual channel, convenient for testing data processing of the tester signal and displaying on one chart, with baseline straightening function;
5. The workstation software have the integral time program setting, with practical functions of baseline locking, negative peak identification and negative peak turnout etc.
6. The data analysis results can be converted into WORD format, convenient for output and copying;
7. Automatically produce file folders with the name of the chromatograph instrument, and produce the time for users to manage several sets of chromatograph instruments simultaneously;

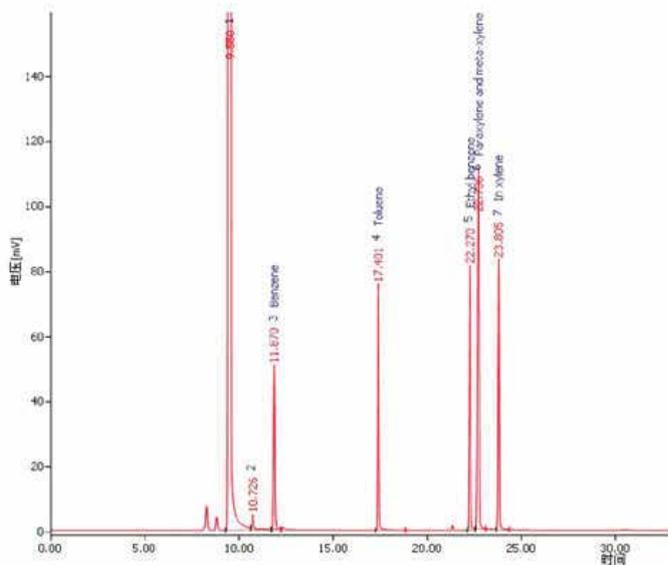
8. 9786NetChorm network version anti-control workstation transmits the analysis results to the place where the users need via various transmission modes (Internet, CAN bus, MODBUS bus, GPRS telecommunication, 3G telecommunication and exclusive radio network);
9. The analysis data can be uploaded to the DCS system, 4mA-20mA output, convenient for industrialized online closed loop control;
10. The multi-thread technique achieves coordinated operation of signal collection, data processing and user management;
11. The unique software architecture attains rich configuration of multiple monitoring seats by one system, and single set of chromatography instrument supports simultaneous access by 3 IP addresses;
12. Configured with analysis result expansion telecommunication interface supports secondary development and function by users;
13. The unique smart spectrum peak identification technology minimizes the spectrum processing parameters by users and realizes automatic process of peak judgment, baseline calibration and automatic process of division of overlapping peak.
14. The CDF document in conformity with A/A (American Association of Analysis) is used to read the sampling data, and interlocks Agilent, Waters and other spectrum workstation;
15. The unique high-fidelity digital filtering algorithm has powerful anti-noise interference and tests the weak peak with same level of the baseline noise;
16. Data processing includes: normalization method, calibration normalization method, single-point calibration method (single-point internal calibration method, single-point external calibration method), and multi-point calibration method (multi-point internal calibration method, multi-point external calibration method);
17. The 9786 NetChorm network-version workstation is configured with "composition content monitoring system" to finish statistics, analysis and monitoring of composition contents, used for data statistics, content change trend, threshold testing and threshold value alarm in production of chemical engineering products (such as reaction, distribution and fine distillation) to make the trend of change of composition content visible and data on the date or the shift is automatically saved to remove manual processing and organizing of spectrum and judgment of results and improve automation of factory.

►► **Technical Parameters:**

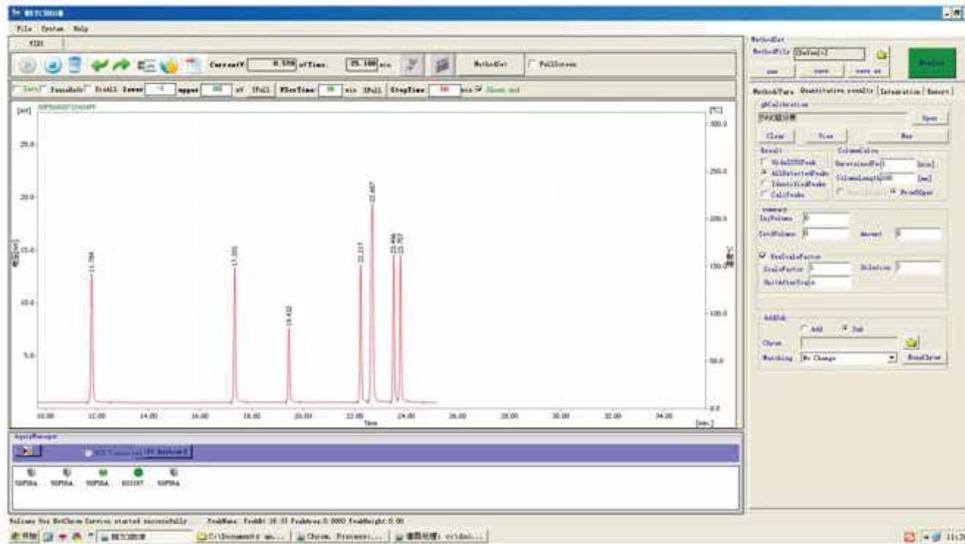
Input voltage range	-2.5V~2.5V
Integral sensitivity	0.05μV•s
Minimum resolution	1μV
Dynamic range	10-7
Linearity	±0.005%
Reoccurrence	±0_005%
Sampling cycle	10, 20, 30, 40 and 50 times/second, adjustable
Linearity	±0.005%
Reoccurrence	±0.005%
Sampling cycle	10, 20, 30, 40 and 50 times/second, adjustable



GC Analyzing Spectrum-1



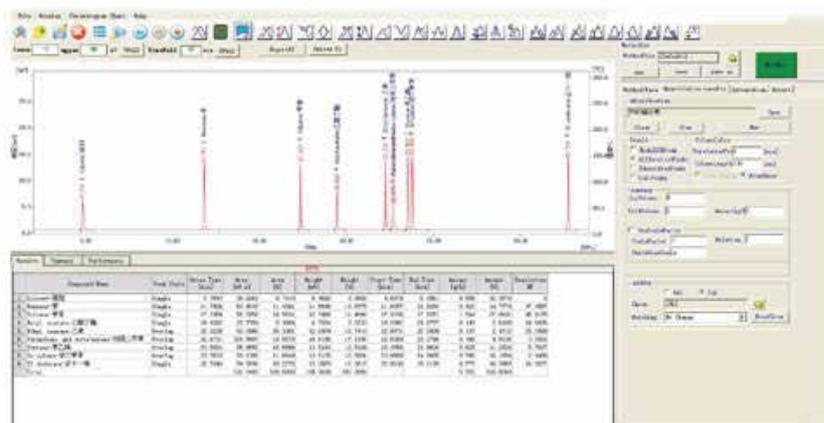
GC Analyzing Spectrum-2



Method setting interface



Temperature interface display after temperature control configuration setting



Processing interface after spectrum

Gas generator series

EP series gas generator is applicable for gas chromatograph instrument of various models home and abroad, produces high purity nitrogen, high purity hydrogen and pure air separately or simultaneously, and replaces the conventional high-pressure gas bottle.

▶▶ EPH-300/500 high purity hydrogen generator

Hydrogen Purity	99.999%
Output Flow	0~300ml/min 0~500ml/min
Output Pressure	0.4Mpa
Power	150W 180W
Dimension	440×210×360mm
Net Weight	12Kg 13Kg



Features:

Small volume, plate electrolyte cell, stainless steel anti-flow liquid device, automatic adjustment of output flow, LED flow display, high-quality low sulfur rubber sealing, and effectively improve gas quality. Liquid display window with LED light for easy maintenance.

▶▶ EPN-300/500 high purity nitrogen generator

Nitrogen Purity	O ₂ ≤3ppm Dew point≤-70°C
Output Flow	0~300ml/min 0~500ml/min
Output Pressure	0.4Mpa
Power	150W 180W
Dimension	440×210×360mm
Net Weight	14Kg



Features:

Plate electrolyte cell, stainless steel anti-flow device, automatic flow output adjustment, LED flow display, high-quality and low-sulfur rubber sealing, effectively improve gas quality. The pre-purification device guarantees purity of the output nitrogen.



▶▶ **EPA-2000/5000 air generator (low-noise air pump)**

Output Flow	~2000ml/min 0~5000ml/min
Output Pressure	0.4Mpa
Power	125W 150W
Dimension	440×210×360mm
Working Noise	≤40dB
Net Weight	19Kg



Features:

The famous brand compressor is provided with starter under normal operation, stainless steel gas storage tank, two-level pressure stabilization and automatic drain makes longer service life and safer.

▶▶ **EPA-380A/580A air generator adopts imported oil-free compressor**

Output Flow	0-3000/5000ml/min
Power	560/600W
Dimension	260*360*665mm / 440×210×360mm
Net Weight	19kg/27kg



▶▶ **EPHA-300/500 (EPHA-300B/500B oil-free
Hydrogen and air all-in-one machine**

**EPX-300/500 (EPX-300B/500B oil-free)
Nitrogen, hydrogen and air all-in-one machine**

Nitrogen Purity	O ₂ ≤3ppm Dew point ≤-70°C
Nitrogen Flow	0~300ml/min 0~500ml/min
Hydrogen Purity	99.999%
Hydrogen Flow	0~300ml/min 0~500ml/min
Output Pressure(N ₂ /H ₂)	0.4Mpa (N ₂ /H ₂)
Air Flow	0~2000ml/min 0~5000ml/min
Air Pressure	0.4Mpa
Working Noise	≤40dB
Dimension	300×455×665mm
Net Weight	47Kg



Features:

Nitrogen, hydrogen and air all-in-one structure, small volume and easy operation, safe, stable and reliable.