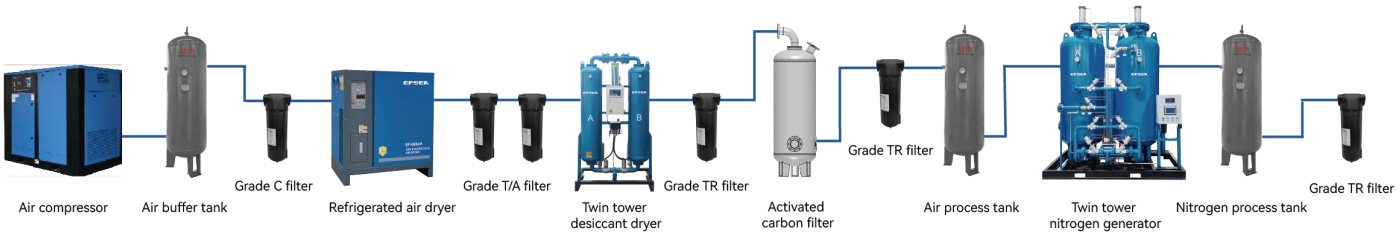
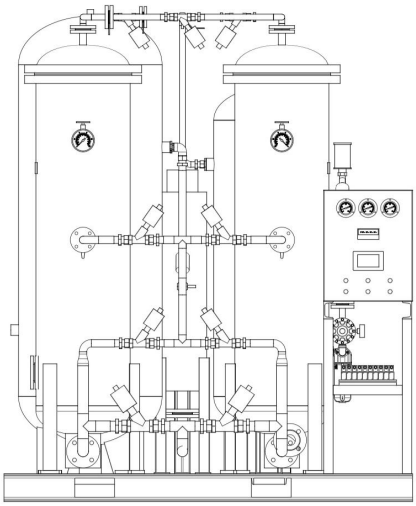
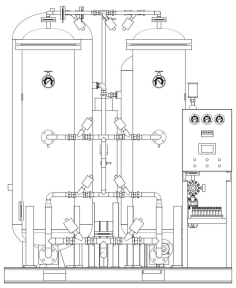


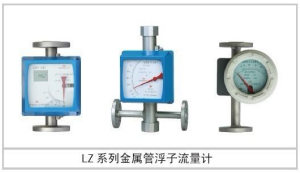
1. Main technical indicators and parameters

EPG-20N Twin-tower nitrogen generator		
1.1 Nitrogen output indicator		
Nitrogen flow	20Nm³/Hr	 (Picture for reference appearance)
Nitrogen purity	99.99%	
Nitrogen pressure	0.1~0.7MPa	
Nitrogen atmospheric dew point	≤-40℃	
Upstream air tank	Standard 0.3m³/0.8MPa	
Downstream nitrogen tank	Standard 0.3m³/0.8MPa	
1.2 Working condition		
Input fluid	Compressed air	
Air consumption	1.6m³/Min	
Air inlet pressure	0.6-0.8MPa	
Air inlet temp.	≤30℃	
Max ambient temp.	45℃	
Cycle time	48-58s	
Compaction method	Palm mat compression	
Regeneration method	Variable pressure desorption, alternate purge	
1.3 Machine features		
L×W×H	1700x1400x2220mm（EST.）	
Weight	1100±100kg（EST.）	
Air inlet pipe connection	DN40（Rp1.5 Female thread）	
Nitrogen outlet pipe connection	DN25（Rp1 Female thread）	
1.4 Rated condition		
Power supply/ voltage	1Phase/220V/50Hz	
Rated power	0.2KW	

CONTROLLED

1.5 Main component features		
	Adsorption tower	1. Strictly follow GB150.1～150.4-2011 to ensure the product has enough thickness and volume. 2. Adopting cyclone gas diffusion technology to achieve uniform distribution of gas in the tower. 3. Combining multiple packing processes such as vacuum charging, blizzard and vibration platform, the molecular sieve is finely filled to ensure that the molecular sieve is tightly arranged without gaps, and with the monitorable cylinder compression device to achieve the best adsorption effect. It can ensure that the molecular sieve is not pulverised.
	Carbon molecular sieve	1. We use brand-new phenolic resin raw material and conduct strict incoming material test on the performance of adsorbents to ensure that all adsorbents used for filling nitrogen generators meet high standards, so as to ensure the stability and reliability of the product performance. 2. We attach great importance to the optimisation of air-nitrogen ratio, and make it reach an excellent level through careful adjustment to achieve efficient separation effect and further improve the performance of our products.
	Control box	1. Equipped with PLC and 7-inch touch screen, multiple remote communication and control options are available. 2. Standard equipment includes digital flow sensor, digital pressure sensor and purity sensor to ensure accurate monitoring of system status. 3. **Adopting advanced (VP) variable cycle control logic**, intelligently adjusting the working cycle according to the actual load condition to achieve high efficiency and energy saving. For example, when the actual load is 80% of the rated flow rate, the control logic can intelligently adjust the variable cycle from 50s to 70s, thus saving air consumption by 20%. When the actual load is 50% of the rated flow rate, the variable period is further extended to 100s, achieving air consumption savings of up to 50%. This intelligent adjustment not only improves the operating efficiency of the system, but also effectively reduces energy consumption and low carbon emission.

CONTROLLED

	All stainless steel pneumatic valve	1. **Applying famous brand, Y-type design, effectively increase flow and reduce flow resistance,** enhance flow up to 30%. 2. The valve has a long service life, after rigorous testing and verification, **can be 24 hours continuous operation of not less than 3 million times (about 6 years or more).** 3. Its self-lubricating characteristics to ensure the convenience of maintenance-free, all stainless steel material is to make it in harsh environments can also work stably. **(Note: 12 pieces are standard for a single unit)**
	Digital flowmeter	1. **Standard stainless steel material, durable and corrosion-resistant.** 2. Equipped with digital display function for intuitive and clear readings. 3. Simultaneously equipped with signal remote transmission function, convenient for users to remotely monitor and collect data.
	Gas analyser	**New long-life electrochemical sensors (over 3 years)** with high accuracy and fast response time
	Pressure Regulator	1. Made of aluminium alloy, it has excellent durability and corrosion resistance to ensure a longer service life. 2. Its precise control ability can ensure the accuracy of pressure adjustment and meet the fine demand for pressure at different ends. Easy operation and flexible adjustment provide users with stable and reliable pressure control experience.
	Pressure sensors	With anti-interference ability, it can accurately detect the change of air pressure at the back-end, which is suitable for remote transmission and energy-saving shutdown control to ensure the stable operation of the system and reduce energy consumption.
	Silencers	1. It adopts patented design to reduce noise and ensure a more peaceful working environment. 2. The effective life cycle of the equipment is up to 10 years or more, durable, no need for frequent replacement, saving a lot of maintenance costs for the user.
	Filter coir mats	**High density, strong toughness, can effectively filter fine particles,**ensure that the molecular sieve will not contact wear and tear, and at the same time play a role in cushioning the airflow.

CONTROLLED

1.6 Optional configurations (not included in this offer)
For other requirements beyond the scope of this configuration, we will further understand and provide customized solutions to meet your personalized needs.
Note: It is recommended to install desiccant dryer or activated carbon degreaser in upstream of the nitrogen generator, which can effectively protect the life of molecular sieve of the nitrogen generator, prolong the service life for 3-5 years, reduce the failure rate, and save the maintenance cost of the nitrogen generator.

2. Control system

2.1 Operating parameter		
Parameter name	**Measuring range**	**Standard/Optional**
Outgoing gas digital flowmeter	Selection according to equipment rating	Standard
Outlet pressure sensor	0~1.6MPa	Standard
Nitrogen purity test	79～99.999%/21%~10 ppm	Standard
2.2 Control function		
Function name	**Functional description**	**Standard/Optional**
Remote start	Passive dry contact	Standard
Remote stop	Passive dry contact	Standard
Remote chain start-stop	Passive dry contact	Standard
Operation signal	Passive dry contact	Standard
Fault signal	Passive dry contact	Standard
Remote communication	International standard modbus protocol / using RS485 to connect to the PC side	Standard
Sensor failure	Alarm indication/recording	Standard
Energy saving control	Flow control/pressure control parameter setting required function	Standard

CONTROLLED

3. Function feature introduction

3.1. Overview

Our nitrogen generator has a simple and integrated structure, and the standard medium pressure equalisation design can effectively improve the purity of nitrogen, reduce air consumption, and ensure that the output flow rate of the equipment and nitrogen gas are stable. Inside the adsorption tower, it is equipped with cyclone diffuser, which can effectively reduce the flow rate and disperse the gas flow to ensure the full contact between the gas and carbon molecular sieve for oxygen and nitrogen gas screening, with stable, reliable and durable performance.

In terms of control, we adopt PLC control system, which realises the visual operation of data with a high degree of intelligence. Combined with the rigorous VP variable cycle control logic and feedback system, we are able to intelligently adjust the switching frequency to meet the needs of different use conditions. At the same time, we can also monitor the nitrogen output index in real time, which is convenient for customers who need to operate remotely to monitor and control from afar.

In addition, the equipment is equipped with a downstream pressure sensor, which can automatically save energy and shut down when the set pressure is reached, effectively reducing energy consumption. We also provide customised control solutions to meet individual customer requirements.

The MCGS visualisation interface makes the display and real-time control of various parameters more intuitive and convenient. The parallel use of multiple units can easily meet the customer's demand for nitrogen in different scenarios, improving the flexibility and adaptability of the equipment.

3.2. Main features of machine

CONTROLLED

(1)Low gas consumption

Twin towers nitrogen generator is fully equipped with brand new, non-refurbished, non-edged and high quality molecular sieves to ensure the high performance and stability of the product. We work closely with molecular sieve manufacturers, and after rigorous testing and development, we have successfully and molecular sieve suppliers to develop a low air-to-nitrogen ratio molecular sieve, whose nitrogen purity is up to 99.99%, and the lowest air-to-nitrogen ratio is lower than 4.2 (need to be customised), compared with conventional molecular sieve 99.99% air-to-nitrogen ratio is generally in the range of ≤ 4.8 (our conventional configuration), saving air consumption of more than 15%. The application of this technology makes our twin-tower nitrogen generator achieve a significant increase in performance, durable, economical, energy-saving and money-saving.

(2)Inequality equalising pressure

All products are **equipped with advanced unequal pressure equalisation structure and segmented pressure equalisation logic as standard**. Compared with the traditional synchronous pressure equalisation method combining top and bottom, this new pressure equalisation design has significant advantages. Firstly, the utilisation of the adsorbent can be significantly improved to ensure that the filled adsorbent can perform at its maximum efficiency. Secondly, the optimisation of

the pressure equalisation process directly reduces the compressed air consumption, which contributes to lower operating costs. In addition, the structure ensures that the purity of the gas is stable and long-lasting, and meets the needs of various purity and flow rate variations.

(3)Blizzard type + Vacuum loading + Vibrating platform filling

Using a combination of blizzard filling device + vacuum loading technology + vibration platform for all equipment, we have successfully optimised the filling process of molecular sieves and significantly improved their compactness. Compared to the traditional method, which only relies on motor vibration, our combined filling technology can increase the loading volume of the same size adsorption cylinder by at least 15% or more. This not only ensures that the molecular sieves are more stable in the tower, but also prevents the potential for sinking and chalking caused by bumpy roads during transport. As a result, our filling technology ensures that the molecular sieves in the tower will continue to perform well for up to 5 years without the need to add or replace molecules due to sinking and chalking, which saves our customers a great deal of cost and time.

(4)Impure evacuation

CONTROLLED

The equipment **comes standard with a nitrogen unqualified automatic exhaust system,** which can intelligently monitor the purity of nitrogen. Once the purity of nitrogen gas does not reach the preset or required concentration standard in the workshop, the system will automatically trigger the control valve to remove the unqualified exhaust gas in time to ensure the purity and safety of the production environment. And when the nitrogen purity exceeds the set value or meets the specific requirements of the user, the system will automatically close the exhaust valve and open the qualified delivery valve at the same time to precisely deliver the high-purity nitrogen to the workshop to meet the production requirements. The whole process requires no human intervention, realising intelligent monitoring and automatic adjustment of nitrogen purity, which greatly improves production efficiency and safety.

(5)Energy saving

The equipment is equipped with digital flow sensors, digital pressure sensors and purity sensors and utilises advanced variable period control logic. This logic allows the duty cycle to be flexibly adjusted to the actual load, resulting in high energy efficiency. At 80% of rated flow, the duty cycle can be extended to 70 s, saving 20% of air consumption; at 50% of rated flow, the cycle can be extended to 100 s, saving 50% of air; and at 30% of rated flow, the cycle can be extended to 130s, saving over 60% of energy. When the flow rate is lower than 10%, the pressure energy-saving

access control, through the suspension of the PLC programme to do 0 energy consumption; pressure is lower than the set lower limit, the PLC programme automatically start to ensure stable operation. This innovative combination makes the equipment both efficient and energy-saving, bringing significant economic and environmental benefits to users.

Due to the continuous updating of technology, we reserve the right to change or upgrade our products without prior notice, so please refer to the final confirmed version when ordering.

CONTROLLED

3.3. Process principle PI diagram

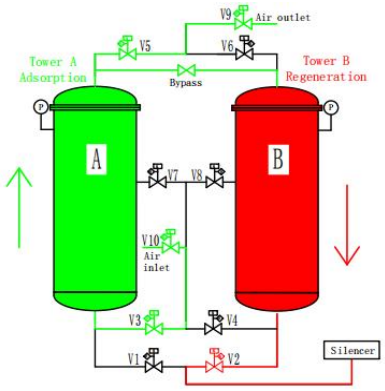


FIG.1 Tower A adsorption,tower B regeneration

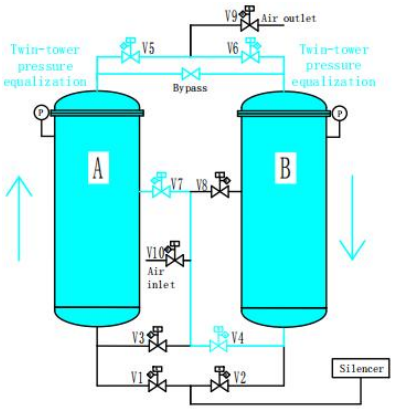


FIG.2 Twin tower pressure equalisation

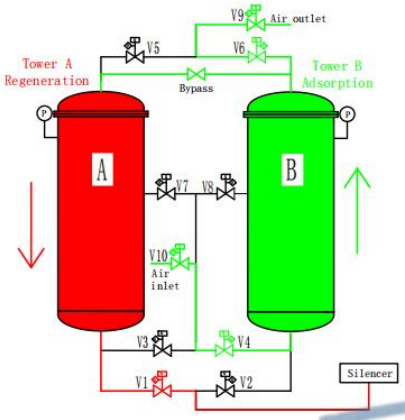


FIG.3 Tower A regeneration,tower B adsorption

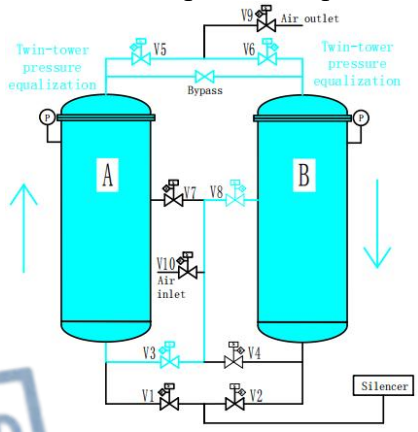


FIG.4 Twin tower pressure equalisation

CONTROLLED

3.4. Some on-site photos for reference

Document version number: Version D0 Prepared:Apr. 2026