

HITACHI NITROGEN GAS GENERATOR

HITACHI
Inspire the Next

Hitachi PSA Nitrogen Gas Generator N₂ Pack

0.75-22kW

NEXTseries Vtype 3.7/5.5kW

NEXTseries 2.2kW



NEXT IIseries 0.75kW

MDseries

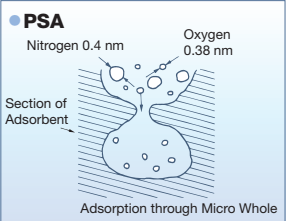


Cost Reduction by On-Site Nitrogen Generation

Q What is the mechanism of nitrogen generation?

A Air is composed of Nitrogen (approx. 78%), Oxygen (approx. 21%) and others (approx. 1%). N₂ Pack is designed to extract nitrogen from air efficiently.

Pressure swing adsorption (PSA) is a technology used to separate nitrogen from air under pressure according to the difference in nitrogen's molecular diameter and affinity for an adsorbent material (a sort of activated carbon). By utilizing PSA, nitrogen can be stably extracted from air at a high quality.



Q Any better way to keep product quality or explosion protection from oxidation?

A N₂ Pack provides nitrogen at purity of 99–99.99% easily. Inactive gas has been widely used as an effective way to cope with oxidation or anti-explosion problems. Nitrogen, an inactive gas under normal temperature, is used mainly as deoxidation in various industries such as food packaging. N₂ Pack is capable to provide stable nitrogen without any special equipment.

PSA Nitrogen Generation Flow

- Air, after compression and dehumidification, is pumped into adsorption tank.
- There are 2 processes taking place inside the adsorption tank, which are i) the process of adsorbing oxygen molecules onto the adsorbent material under pressure and abstracting nitrogen molecules, ii) the process of desorbing oxygen molecules from adsorbent material by depressurization to atmospheric pressure. In order to have continuous nitrogen output, the two processes repeat alternately in the two parallel adsorption tanks. This method is called PSA (Pressure Swing Adsorption).
- Generated nitrogen is stalled in the gas tank, which the purity is monitored by integrated oxygen sensor.

Application (examples)

1 Food

2 Medicine

3 Electronic

<Surrounding Gas for Manufacturing Process>

4 Metal

5 Ceramic

6 Machinery

<Enclosure Gas in Shock Absorber>

7 Resin Product

<Antioxidant during Production>

8 Tier Filling

●Hitachi bears no patent responsibility of the manufacturing equipment which use the gas. Do relevant research on user's side.

Q Feel troublesome to adjust the residual quantity of gas cylinder or changing the gas cylinder?

A Possible to have nitrogen provision by ONLY pressing the switch. Control covers both air compressor and PSA. By pressing the switch, auto operation starts, and nitrogen is supplied.

Q Want to reduce the cost of nitrogen or deoxidation?

A It is possible to reduce cost*. N₂ Pack provides nitrogen by using air at a low level of cost. Since N₂ Pack uses ambient air as raw material to provide nitrogen, reduction of cost is possible. Further, if both nitrogen and other deoxidation are used during production, the volume of deoxidation can be reduced accordingly.

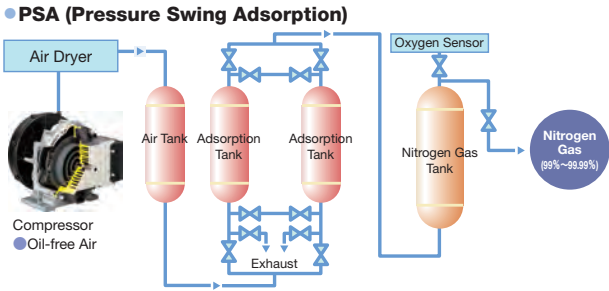
* Cost merit may differ due to the actual condition of current use of nitrogen and deoxidation.

Q Any influence from oil?

A By using Oil-free compressor, environment of Oil-free is preserved. Oil-free scroll air compressor with high reliability is adopted for all models. It is not necessary to worry about oil-change or oil disposal. Oil mist filter is not necessary either.

* Oil included in the surrounding air will be included in the discharge air from air compressor.

Nitrogen Generator Flow Chart



Specifications

● N ₂ Pack® NEXTIIseries 0.75								● N ₂ Pack® NEXTseries 2.2		
Item・Unit	Model	Output (50/60Hz)	kW	0.75			0.9		2.2	
				NPO-0.752N2S5	NPO-0.753N2S5	NPO-0.754N2S5	NPO-0.752N2S6	NPO-0.753N2S6	NPO-0.754N2S6	
Nitrogen Gas Purity ^{*1}		%		99	99.9	99.99	99	99.9	99.99	99
Nitrogen Gas Capacity ^{*2, *3}		m ³ /h		1.7	1.3	0.9	2.0	1.4	1.0	5.7
Nitrogen Gas Discharge Pressure		MPa		0.50	0.55	0.50	0.50	0.55	0.50	0.50
Nitrogen Gas Discharge Port				Rc 1/4			Rc 1/4		Rc 1/4	
Ambient Temperature		°C		5–35			5–35		5–35	
Ambient Humidity ^{*4}		%		30–80			30–80		30–80	
Compressor	Model			Oil-free Scroll Compressor×1			Oil-free Scroll Compressor×1		Oil-free Scroll Compressor×1	
	Control Method			Pressure Switch Control			Pressure Switch Control		Pressure Switch Control	
Dimensions ^{*5} (W×D×H)		mm		550×600×1,140			550×600×1,140		980×650×1,400	
Weight (Entire Unit)		kg		178			178		367	
Noise Level ^{*6, *7, *8}		dB[A]		42			44		46	

● N₂ Pack® NEXTseries Vtype 3.7/5.5

Item・Unit	Model	Output (50/60Hz)	kW	3.7			5.5		
				NPO-3.72VNP	NPO-3.73VNP	NPO-3.74VNP	NPO-5.52VNP	NPO-5.53VNP	NPO-5.54VNP
Nitrogen Gas Purity ^{*1}		%		99	99.9	99.99	99	99.9	99.99
Nitrogen Gas Capacity ^{*2, *3}		m ³ /h		10.2	7.2	4.8	15.0	10.2	6.9
Nitrogen Gas Discharge Pressure		MPa		0.50	0.55	0.50	0.50	0.55	0.50
Nitrogen Gas Discharge Port				Rc 1/4			Rc 1/4		
Ambient Temperature		°C		5–35			5–35		
Ambient Humidity ^{*4}		%		30–80			30–80		
Compressor	Model			Oil-free Scroll Compressor×1			Oil-free Scroll Compressor×1		
	Control Method			Inverter (Constant Pressure Control)			Inverter (Constant Pressure Control)		
Dimensions ^{*5} (W×D×H)		mm		980×900×1,475			980×900×1,475		
Weight (Entire Unit)		kg		473			539		
Noise Level ^{*6, *7, *8}		dB[A]		50			53		

● N₂ Pack® MDseries 7.5/11

Item・Unit	Model	Output (50/60Hz)	kW	11			16.5		
				NPO-7.52MDP5	NPO-7.53MDP5	NPO-7.54MDP5	NPO-112MDP5	NPO-113MDP5	NPO-114MDP5
Nitrogen Gas Purity ^{*1}		%		99	99.9	99.99	99	99.9	99.99
Nitrogen Gas Capacity ^{*2, *3}		m ³ /h		26	18	12	37	26	20
Nitrogen Gas Discharge Pressure		MPa		0.50	0.55	0.50	0.50	0.55	0.50
Nitrogen Gas Discharge Port				Rc 3/8			Rc 1/2		
Ambient Temperature		°C		5–35			5–35		
Ambient Humidity ^{*4}		%		30–80			30–80		
Compressor	Model			Oil-free Scroll Compressor×2			Oil-free Scroll Compressor×3		
	Control Method			Multi-Drive Mode			Multi-Drive Mode		
Dimensions ^{*5} (W×D×H)		mm		2,456×925×1,450			2,756×925×1,800		
Weight (Entire Unit)		kg		1,027			1,366		
Noise Level ^{*6, *7, *8}		dB[A]		56			58		

● N₂ Pack® MDseries 15/22

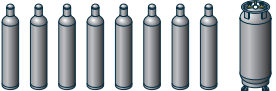




Item・Unit	Model	Output (50/60Hz)	kW	22.5			30		
				NPO-152MDP5	NPO-153MDP5	NPO-154MDP5	NPO-222MDP5	NPO-223MDP5	NPO-224MDP5
Nitrogen Gas Purity ^{*1}		%		99	99.9	99.99	99	99.9	99.99
Nitrogen Gas Capacity ^{*2, *3}		m ³ /h		52	36	25	68	50	35
Nitrogen Gas Discharge Pressure		MPa		0.50	0.55	0.50	0.50	0.55	0.50
Nitrogen Gas Discharge Port				Rc 1/2			Rc 1/2		
Ambient Temperature		°C		5–35			5–35		
Ambient Humidity ^{*4}		%		30–80			30–80		
Compressor	Model			Oil-free Scroll Compressor×3			Oil-free Scroll Compressor×4		
	Control Method			Multi-Drive Mode			Multi-Drive Mode		
Dimensions ^{*5} (W×D×H)		mm		2,950×1,100×1,930			2,960×1,200×1,930		
Weight (Entire Unit)		kg		1,821			2,218		
Noise Level ^{*6, *7, *8}		dB[A]		63			65		

*1. Total capacity of nitrogen gas and other gases (such as argon gas).
*2. Capacity is the converted value under the temperature of 20°C, humidity of 60%, and with no clog on the suction filter of compressor.
*3. Nitrogen gas purity decreases when ambient temperature is high, or ambient humidity is high. If nitrogen gas purity decreases due to ambient temperature, it is recommended to decrease the nitrogen gas amount of use.
*4. It indicates relative humidity.
*5. Dimensions indicate the entire unit (including recommended installation interval between units). Dimensions do NOT include protruding objects.
*6. Noise level is measured at 1.5m in front in an anechoic room when full-load operation. It varies in different operating conditions and/or different environments with echo of actual field installations.
*7. Noise level is increased by 1-2 dB[A] when air dryer operates.
*8. The increase of noise level when Adsorption Tank exhausts is NOT included.
*9. [Energy Save mode] is default setting when shipment.

Nitrogen Supply with Reasonable Cost*

* Cost merit may differ due to the actual conditions.

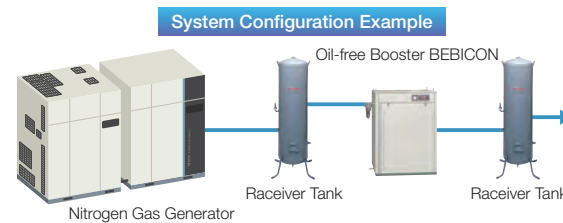
N₂ Pack Model Selection Reference

N ₂ Pack Model	NPO-0.75 <i>NEXT II series</i>		NPO-2.2 <i>NEXT series</i>		NPO-3.7 <i>NEXT series V type</i>		NPO-5.5 <i>NEXT series V type</i>		NPO-7.5 <i>MD series</i>			NPO-11 <i>MD series</i>			NPO-15 <i>MD series</i>		NPO-22 <i>MD series</i>	
Pressure (MPa)	0.50–0.55																	
Nitrogen Gas Capacity (m³/h)	0.9–2.0		3.0–5.7		4.8–10.2		6.9–15.0		12–26		20–37		25–52		35–68			
Nitrogen Gas Amount of Use (m³/h)	0	2	4	6	8	10	14	18	22	26	30	40	50	60				
Nitrogen Gas Amount of Use (m³/8h)	0	16	32	48	64	80	112	144	176	208	240	320	400	480				
Daily Used Amount by Gas Vendor																		
	Nitrogen Gas Cylinder (Volume: 7m³)				Liquefied Nitrogen Cylinder (Volume: Approx. 107 m³ (119kg))								Nitrogen Storage Tank at 1,200 m³ (2,000kg) or above					

* Daily used nitrogen gas amount is calculated at 8h/day as working hour.

Possible to Increase Pressure with Oil-free Booster BEBICON

- It is possible to increase pressure of nitrogen gas by installation of Oil-free Booster BEBICON.
- It is possible to respond to different requirements of nitrogen purity.
- For details, contact your nearest Hitachi representative office.



NEXT II series

Oil-free Scroll Compressor Loaded, High Level of Energy-Saving

Control of N₂ Pack covers both air compressor and PSA.

Energy-Saving

Process of nitrogen generation is optimized responding to the nitrogen used amount, which achieves high-level of Energy-Saving.

High Capacity

Class top level of nitrogen capacity is achieved by adoption of high-efficiency adsorbent material and combined control of both air compressor and PSA.

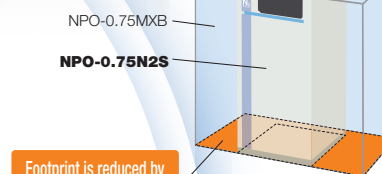
Low Noise Low Vibration

Low noise and low vibration is achieved thanks to Oil-free Scroll compressor.
Noise level at 42/44 dB(A) (50/60Hz) (NPO-0.75N2S)

Compact

One package structure is possible due to the adoption of high-efficiency adsorbent material.

Compact, Space-Saving



Air Dryer
Oil-free Scroll Compressor



Remote Operation and External I/O Terminal as Standard

Besides various external I/O terminals as standard equipment, output of various alarms is also equipped.

Input	Remote Switch	Operation
Output	Operation Response	General Trouble (Compressor)
	Nitrogen Gas Discharge	General Alarm (Density Alarm, Pressure Alarm)

NEXT series

ALL MODELS ARE LOADED WITH OIL-FREE SCROLL COMPRESSOR.

Energy-Saving by Inverter Control

V type 3.7 5.5

Large Nitrogen Capacity

Full Range 2.2 3.7 5.5

Easy-To-Use

Full Range 2.2 3.7 5.5

Space-Saving due to One-Package Structure

Various Convenient Equipment Available



NPO-5.5VNP



Oil-Free Scroll Compressor Head.

Hitachi original control of both compressor and nitrogen generation process

Energy-Saving

No need of periodic change of adsorbent material thanks to Oil-free compressor. Low maintenance cost is possible.

Low Cost

By loading Oil-free Scroll compressor, low noise and low vibration is possible.

Low Noise, Low Vibration



NPO-22MDP

MD series

MERITS OF OIL-FREE SCROLL COMPRESSOR

MERITS OF OIL-FREE SCROLL COMPRESSOR
1

NO Oil-Related Trouble or Maintenance Cost

MERITS OF OIL-FREE SCROLL COMPRESSOR
2

Low Vibration Possible

Energy-Saving by Multi-Drive Control

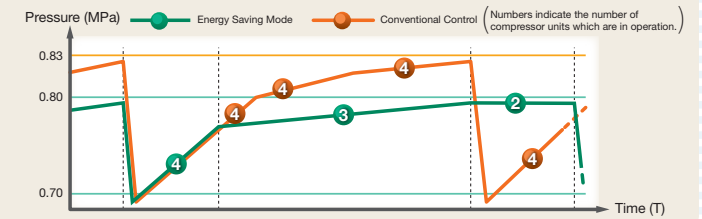
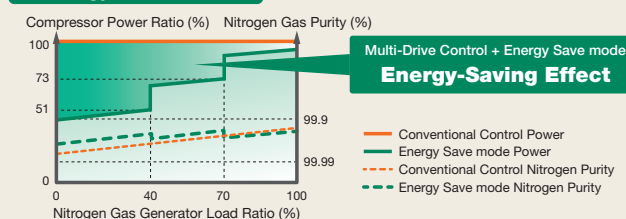
Operation of multiple compressor heads is automatically controlled, responding to the nitrogen used amount.

[Energy Save mode], under which the process of nitrogen generation is optimized, is set.

Energy-Saving operation is possible with keeping nitrogen purity and necessary pressure.

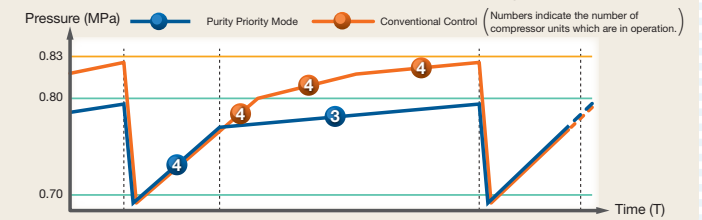
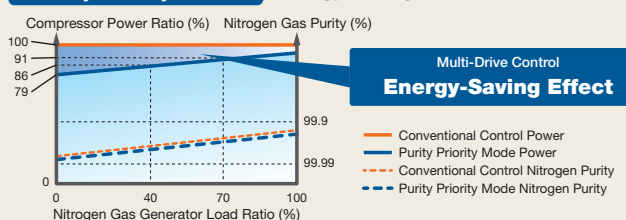
Energy Save mode

Energy-Saving effect of **49%** at load ratio 40%, **27%** at load ratio 70%, **4%** at load ratio 100% is possible.



Purity Priority Mode

Energy-Saving effect of **14%** at load ratio 40%, **9%** at load ratio 70%, **4%** at load ratio 100% is possible.





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