

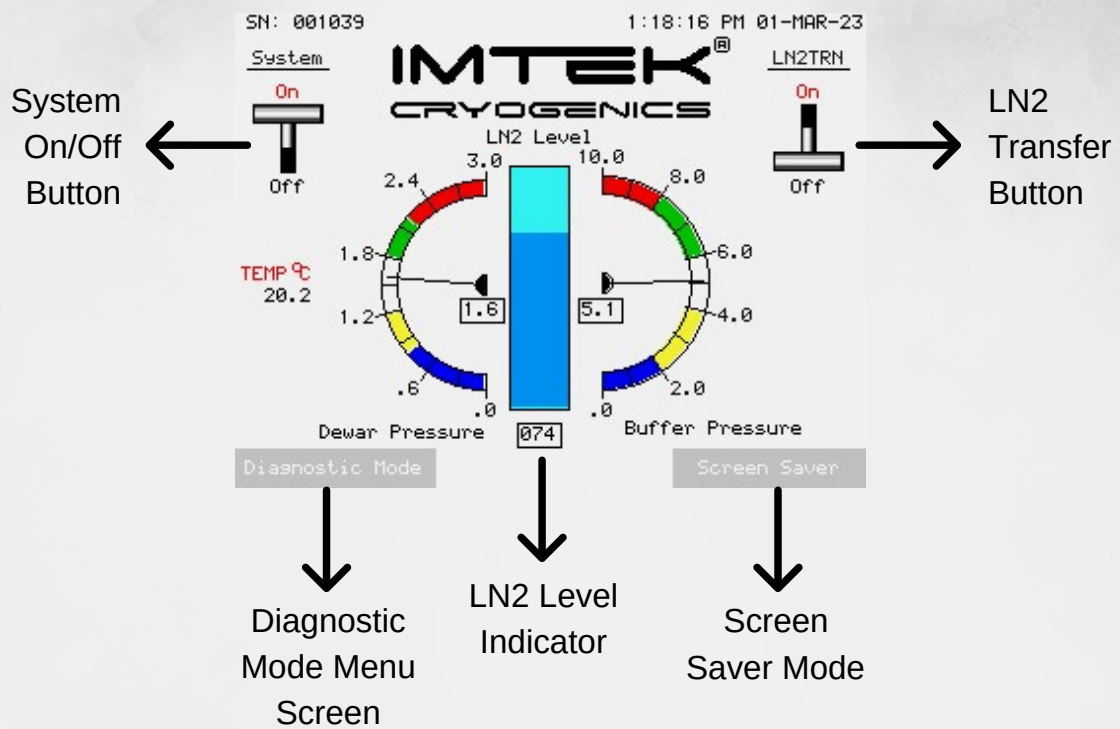
# NEW GENERATION CRYOGENIC NITROGEN PLANTS

Your nitrogen, our priority.

The CNP21 is a state-of-the-art liquid nitrogen plant with a production capacity of 21+ liters per day. In addition, the CNP21 also features a laboratory station version (CNLab21), which is ideal for applications requiring smaller volumes of liquid nitrogen. Both models are designed as a plug-and-liquefy system. With a user-friendly interface and one-button operation, the CNP series liquefiers can be easily integrated into any environment. Simply make the necessary electrical connections and enjoy fully automated operation, facilitated by the PLC controller. The operator is only required to replace filters and perform routine checks at maintenance intervals of 8,000 operating hours.



The production of liquid nitrogen is achieved through liquefaction from air, which is then stored in an internal Dewar with capacity of your choice. The availability of liquid nitrogen is ensured at all times, allowing for convenient filling of the dispensing thermos or transfer to external Dewars via a flexible hose with a simple activation. The transfer of liquid nitrogen is independent of the system's operating mode, and the programmable logic controller (PLC) automatically initiates production when the Dewar level drops to 70%. The plant will stop production when the Dewar is full, entering standby mode until liquid nitrogen is transferred.



The CNP21 Nitrogen Generation and Storage System's Programmable Logic Controller (PLC) interface includes five essential screens. The Main screen serves as the central control panel, offering start/stop controls, diagnostic mode, and pressure indicators for seamless operation. The Service Screen provides direct monitoring and control over key components and features multilingual options. A dedicated Cryo-Service Screen ensures customers always have easy access to technical assistance contact information. The Maintenance screen, tailored for system purge and technical interventions, facilitates efficient service operations. Lastly, the Initialization Screen aids users during the initial setup and purging, transitioning to the Main screen once the setup is complete. These interfaces seamlessly integrate to provide comprehensive control over the system's operations.



Experience enhanced accessibility and convenience with the CNP21's advanced PLC screen interface. This innovative system not only centralizes control and offers comprehensive monitoring capabilities, but it also enables remote monitoring from your personal computer! Moreover, the Diagnostic's Screen pictured above allows for monitoring of the Air Pressure in the Air Compressor and Buffer Tank as well to ensure safe operation. There is close monitoring of the purity level of the Liquid Nitrogen produced through the O2 Level indicator as well! The interface persistently exhibits real-time Oxygen and Purity sensor readings, ensuring immediate, accurate understanding of the LN2's quality and enabling quick reactions to any deviations in purity or oxygen levels. Further enhancing its functionality, the PLC interface consistently generates reports encompassing product purity, oxygen levels, system status, and other vital operational parameters. These reports can be configured to be delivered at predetermined intervals or on demand, offering operators a comprehensive insight into the system's performance and the LN2 quality.

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Buffer AutoPurge		Dewar AutoPurge	
Air Comp OFF	0.0	Air Pressure is LOW	
Buffer Purge OFF	0.0	Dewar Purge OFF	0.0
Circulation Pump OFF		He Comp OFF	
Chiller OFF		CNPTemp is HIGH	0.0
Restart Level: %	6	Air Comp	00000 h
		He Comp	00000 h

O2 Lvl:  
Dew P.:  
Level: 0 dec.

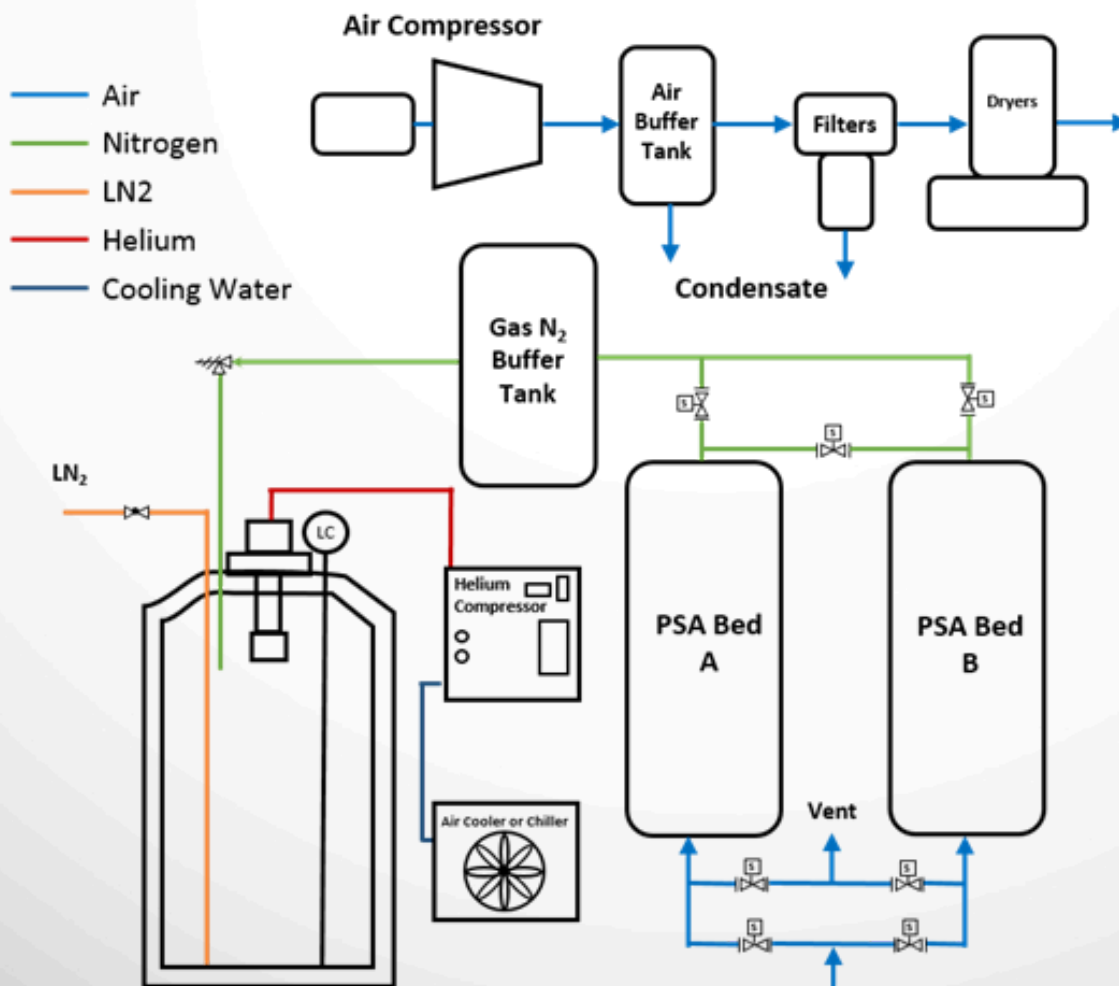
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Home    CryoService    Alarm History    Service



Atmospheric air is compressed to high pressure by an oil-free built-in compressor and subsequently directed to a Buffer Tank. The high-pressure air within the Buffer Tank is then directed to a filter group located behind the unit in order to remove water droplets and particles from the air. Subsequently, an internal air dryer eliminates any remaining moisture within the gas phase. The resulting treated dry and clean air, with a dew point of up to  $-40^{\circ}\text{C}$ , is then directed to one of the adsorber beds located within the Pressure Swing Adsorption (PSA) module.

PSA technology can effectively deliver nitrogen at the requisite purity level for liquefaction. The carbon molecular sieve located within the PSA beds selectively adsorbs oxygen and carbon dioxide molecules until the bed becomes saturated. Once saturation occurs, the feed flow process valves are switched to the second adsorption bed while the first adsorption bed is rapidly depressurized and purged to remove adsorbed oxygen. By continuing to switch between the two beds, a constant flow of pure nitrogen gas is generated. The purified nitrogen is then directed through a nitrogen buffer tank and ultimately into a cryogenic storage tank where it is stored alongside the cryocooler and other associated instrumentation.



MODEL	CNLab21	CNP21
<b>Air-Cooled Versions</b>		
<b>Production Rate</b>	≥ 21 liter/day	
<b>Electrical Options</b>	200 V, 220-240 V (±10%) @50HzV1~ 208-230 V (±10%) @60Hz V1~	
<b>Power Consumption (Steady State)</b>	3.1 kW @50Hz 3.3 kW @60Hz	
<b>Dimensions (W x L x H)</b>	765mm x 1215mm x 1100 mm	
<b>Weight</b>	350kg	
<b>Suggested Installation Area</b>	2m (W) x 2m (L) x 2m (H)	
<b>Built-in Air Compressor</b>	Built-In Oil-Free Compressor, ≥ 2 m <sup>3</sup> / hour @7 bar (102 psig)	
<b>Cryocooler</b>	GM Type Cryocooler Mounted on Dewar	
<b>Compressor</b>	He, 99.995% purity @ 19-19.3bar (275-280 psig), Air Cooled	
<b>Built-In Nitrogen Generator</b>		
<b>Purity</b>	≥ 99%	
<b>Dew Point</b>	up to -40°C	
<b>Flow Rate</b>	≥ 1 m <sup>3</sup> / hour	
<b>PLC Interface</b>	6" Color Graphic Touch Screen	
<b>Dewar Volume</b>	80 L	
<b>Dewar Evaporation Rate</b>	0.1 liter/day	
<b>Operating Pressure</b>	1.9 bar	
<b>Req. Cooling Water Capacity (For Water-Cooled Versions)</b>	5 kW (Cooling Power) 4-9 L/min	
<b>Dewar Level Control</b>	Capacitive Level Sensor	
<b>Ambient Temperature Range</b>	+4°C to +40°C	
<b>Maximum Altitude</b>	3000 meters	
<b>Noise Level</b>	< 65 dB @ 1 meter	
<b>Conformities</b>	CE Conformance, ISO 12100:2010, IEC 60204-1, 2006/42/EC, 97/23/EC; ISO9001:2015	

CNP is a registered trade mark of Imtek Cryogenics.  
We reserve the right to make modifications to our product offerings at any time, without prior notice.