

Quantum Liquid Nitrogen Generating Plants

- **Highly reliable**, low-maintenance
- **Convenient**, requiring only compressed air and electrical power
- **Fully automatic**: unattended operation

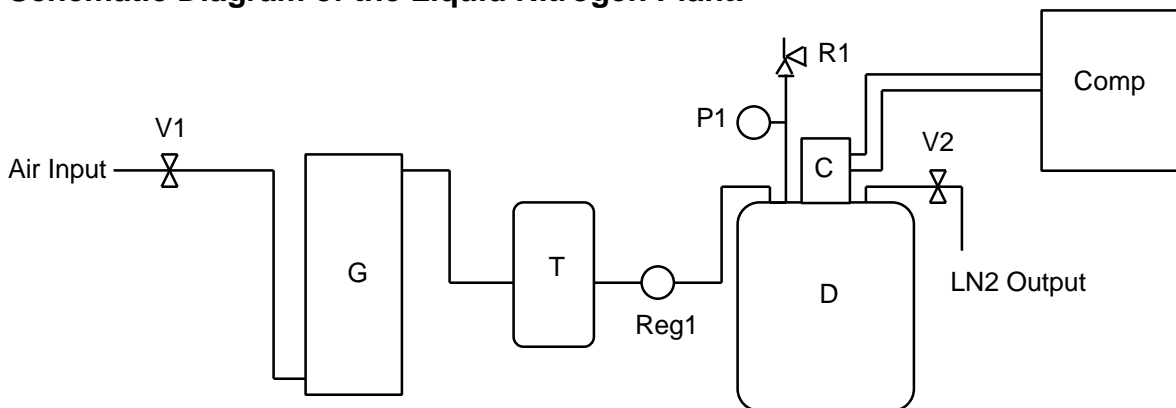
Principle of Operation:

Compressed air, controlled by valve V1, is forced through an air separator (G). The resulting flow of nitrogen is typically 97% pure. A regulator (Reg1) draws off a low-pressure flow of nitrogen to the dewar (D). In the dewar, a closed-cycle coldhead (C) cools and liquefies the nitrogen. As the dewar fills, liquid nitrogen may be drawn off through the transfer line controlled by valve V2. A level meter turns off the plant when the dewar is full and restarts the system when the dewar drops to 75% full.



Model 4160 (40 L/day)

Schematic Diagram of the Liquid Nitrogen Plant:



G	Nitrogen Generator	T	Nitrogen Storage Tank
D	Liquid Nitrogen Storage Dewar	C	Coldhead
Comp	Helium Compressor	V1	Compressed Air Inlet Valve
V2	Liquid Nitrogen Drain Valve	Reg1	Regulator
R1	Dewar Pressure Relief Valve	P1	Dewar Pressure Gauge

SPECIFICATIONS:

PRODUCTION RATES: 12 / 20 / 40 / 80 L/day and up

RESERVOIR CAPACITIES: 40 L & 160 L

ELECTRICAL: for 12 L/day: 2 kW 1 phase
20 L/day: 5 kW 3 phase
40 L/day: 6 kW 3 phase
80 L/day: 12 kW 3 phase

All standard voltages available – please inquire if 3 phase power is unavailable

COOLING: water or air (Water cooling is quieter with less heat rejection to ambient)

FEED GAS: air at 8 bar (125 psig)

Required flow rates as follows: for 12 L/day: 29 L/min (1 scfm)
20 L/day: 45 L/min (1.6 scfm)
40 L/day: 80 L/min (3 scfm)
80 L/day: 160 L/min (6 scfm)

If dry nitrogen is available at 0.3 bar (5 psig), then the separator may be omitted and system price is reduced.

CONTROL SYSTEM: Includes liquid level gauge on reservoir with high and low set points for auto-stop and start.

PHYSICAL: Dimensions: within 1.5 m x 1.5 m x 2 m high
Mass: 250 kg (approx.)
Environment: temperature range 5 C to 43 C, well-ventilated, sheltered

MAINTENANCE: Helium compressor adsorber replacement: every 10,000 hrs of operation
Cold head service: every 10,000 to 20,000 hrs of operation, as required

WARRANTY: One year parts and factory service

ACCESSORIES AVAILABLE:

- Air Compressor: Oil-free, 115 VAC, 15 A, 1 phase, 60Hz, 3 scfm @ 120psi
- Stainless steel enclosure for clean room use (available on 12 L/day model only)
- Automatic fill system for customer's equipment, including level sensors, control system, solenoid valve and transfer line.
- Hand held oxygen meter (for measuring the fraction of oxygen in the product stream or work-space atmosphere) and replacement sensor elements.

FOR LARGER CAPACITY and industrial scale plants please call Quantum for a quotation.

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