NEOMETRIX

Nitrogen Gas Boosting Station

Product Catalog

www.neometrixgroup.com

About us:

Neometrix Defence Celebrating 20 Years of Excellence! For the past two decades, Neometrix Defence has maintained its position as a premier provider of advanced test benches and rigs.

Our accreditation by the Directorate General of Aeronautical Quality Assurance, India (DGAQA) and Defence Research & Development Organization, India (DRDO) underscores our commitment to upholding the highest international defence industry standards.

Counting the Indian Air Force/Army/Navy, Ministry of Defence, Hindustan Aeronautical Limited, and DRDO among our esteemed clientele, we are recognized for delivering state-of-the-art solutions and unwavering performance reliability.

Strengths & Capabilities:

Neometrix Defence is a powerhouse of engineering brilliance, proudly serving every Indian Air Force station and partnering with the Indian Army, Navy, Railways, BARC, NPCIL, and ISRO. With a team of over 100 elite engineers and visionary founders from IIT Kanpur and IIT Delhi, we harness cutting-edge technology to set the gold standard in mechanical engineering.

We Don't Just Meet Industry Demands – We Define Them!

- We have established our presence in all Air Force stations across India. With the Indian Air Force as our leading customer, we are dedicated to upholding the highest standards of excellence in the aerospace industry.
- Our extensive clientele extends beyond the defence industry, including projects with the Indian Army, Navy, Railways, BARC, NPCIL, ISRO, and more. In essence, we excel in all aspects of mechanical engineering!
- Our team comprises over 100 graduate engineers, supported by a cutting-edge manufacturing site equipped with state-of the-art machinery, enabling us to meet the highest Engineering standards.
- The founders of our company are distinguished graduates from IIT Kanpur and IIT Delhi, bringing extensive expertise and a wealth of engineering knowledge to Neometrix Defence.

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Introduction:

The P0938 Nitrogen Gas Boosting System is our newest turnkey solution for generating ultra-high-pressure nitrogen on demand. Building on two decades of design and manufacturing excellence at Neometrix Defence, the P0938 pairs a Haskel AG-75 single-stage pneumatic booster with precision Festo control hardware to deliver oil-free nitrogen up to 300 bar, all from standard plant-air supplies (4–8 bar).

Key points:

- Purpose-built for clean gas applications – ideal where hydrocarbon contamination is unacceptable (semiconductor, pharmaceutical, food).
- Self-contained & portable – compact lockable-wheel frame lets you move the unit across labs or shop floors without special handling equipment.
- Modular design – standardized fittings, easily swapped boosters, and plug-and-play control elements reduce downtime for maintenance or upgrades.

Housed in a compact, powder-coated mild-steel frame on lockable casters, the system can be rolled seamlessly between laboratories or production cells without the need for forklifts or cranes. Its modular fittings—standardized quick-disconnects for filters, regulators, booster units, and gauges—allow maintenance teams to swap out wear items or upgrade components in minutes rather than hours, dramatically reducing downtime and ensuring continuous uptime.

System Overview:

The Nitrogen Gas Boosting System brings together five compact, high-performance modules in a single, portable package. At its core, a Haskel AG-75 booster uses clean, filtered plant air (4–8 bar) to generate oil-free nitrogen up to 300 bar. A Festo air-prep station ensures drive-air purity and pressure stability, while precision pneumatic logic valves and flow sensors automatically regulate the booster's cycle rate. Stainless-steel gas passages and PTFE seals guarantee zero hydrocarbon carry-over, and a spring-loaded relief valve protects against overpressure. All assemblies—air prep, booster, gas inlet/outlet, frame and control panel—are mounted on a powder-coated steel chassis with lockable casters. An intuitive 4.3″ HMI displays real-time pressure curves, cycle counts and alarms, and offers analog/digital I/O or Modbus connectivity for seamless integration into existing PLC or SCADA systems.

Key Subsystems

- Air Preparation: Festo filter, regulator and relief valve for ISO 8573-1 Class 2.4.3 drive air
- Pneumatic Booster: Haskel AG-75 single-stage, 75:1 ratio with cooling fins for continuous operation
- Gas Connections: Swagelok® high-pressure inlet (20–150 bar) and outlet (up to 300 bar) with dual gauges
- Mobility Frame: Wheeled, powder-coated mild-steel chassis with ergonomic handles and skid protection
- Control Panel: 4.3″ touchscreen HMI plus 8 DI/DO and 4–20 mA outputs; optional Modbus-RTU/Ethernet module

Core Duty & Operation:

The Nitrogen Gas Boosting System excels at four primary use cases:

Non-Destructive Leak Testing

- Pressurize vessels, hoses or fittings to up to 300 bar; hold and monitor pressure decay (<1 bar/hr leakage threshold).

Accumulator & Gas-Spring Charging

- Precisely pre-charge hydraulic accumulators or gas springs without oil carry-over.

Cylinder Refill & Specialty-Gas Topping

- Economical top-up of residual gases in research or industrial cylinders.

Lab-Scale High-Pressure Supply

- On-demand clean nitrogen for materials testing, prototype evaluations or calibration rigs.

Operation is as simple as:

1. Condition drive air
2. Connect gas feed and outlet hoses
3. Dial in outlet pressure
4. Start cycle; monitor gauges and HMI logs.

Technical Specifications:

Parameter	Value
Drive Air Pressure	4–8 bar (60–120 psi)
Drive Air Flow	10–80 scfm
Drive Ratio	75:1
Inlet N_2 Pressure	20–150 bar (300–2 175 psi)
Max Outlet N_2 Pressure	300 bar (4 350 psi)
Displacement / Cycle	1.2 in³ (≈19.6 mL)
Max Cycle Rate	60 cycles/min
Operating Temperature	5–50 °C
Weight	27 lb (12.2 kg)
Frame Dimensions (L×W×H)	750 × 450 × 540 mm
Gas Connections	3/8″ SAE inlet; 1/4″ HP outlet
Materials	SS316 booster; MS frame
Control Elements	Festo FRL, ball valves, Wika pressure gauge

Salient Features:

- Oil-Free, Hydrocarbon-Free: Guaranteed zero oil carry-over thanks to complete separation of drive and gas sections.
- High Throughput: Continuous duty up to 60 cycles/min with active booster-cooling fins.
- Precision Control: Festo regulator plus digital pressure transducer (±0.5 % FS) for exact setpoints.
- Integrated Safety: Pneumatic relief valves on drive and gas sides; HMI alarms for over-pressure, drive loss or leaks.
- Easy Maintenance: Quick-disconnect tubing, modular FRLs and spare booster swappable in under 15 minutes.
- Transport Ready: Lockable industrial casters and drop-in battery option for remote use.

Main Features & Applications:

The Nitrogen Gas Boosting System combines precision control, intrinsic safety and versatile functionality in a single, compact package. At its core, a high-accuracy Festo regulator maintains drive-air within ±0.1 bar, delivering repeatable outlet pressures up to 300 bar. Closed-loop feedback from a digital pressure transducer lets you program multi-stage sequences—ramp, hold and vent—directly on the 4.3″ HMI or via PLC/SCADA commands. Safety is built in: drive-air over-pressure is automatically relieved at 8 bar, and an independent nitrogen relief valve opens at 310 bar to prevent gas-side excursions. Stainless-steel gas passages and PTFE seals guarantee zero oil carry-over, making this system ideal wherever purity is paramount.

Key Applications:

- High-Pressure Leak Testing: Pressurize hoses, fittings or vessels to 300 bar and monitor decay (<1 bar/hr) for sub-ppm leak detection.
- Accumulator & Gas-Spring Charging: Deliver oil-free pre-charges with ±0.5 bar accuracy, protecting seals and extending component life.
- Pipeline Purging & R&D Supply: Generate clean nitrogen flows for moisture/oxygen removal or laboratory materials testing on demand.

Together, these capabilities ensure the Nitrogen Gas Boosting System meets the stringent requirements of modern industrial, laboratory and Defense environments—delivering purity, precision and safety in every cycle.

Operating Procedure:

1. Pre-Run Checklist
    - Verify drive-air quality (≤0.5 mg/m³ oil, ≤5 µm particulate).
    - Inspect hoses, fittings and frame integrity.
2. Setup
    - Connect nitrogen feed; purge hoses to remove ambient air.
    - Securely tighten all fittings to recommended torque (25 Nm).
3. Parameter Entry
    - Set desired outlet pressure and cycle-rate on HMI.
    - Define hold time for leak tests (e.g., 30 min at set pressure).
4. Start & Monito
    - Press “Run”; watch gauges and HMI.
    - Check for stable pressure build-up and no rapid venting.
5. Shutdown
    - End cycle; isolate feed and vent residual pressure.
    - Close all valves, lock casters, record run summary in logbook.


NITROGEN GAS BOOSTING SYSTEM
PASKALS