NEOMETRIX

Hydraulic Refilling Trolley

Product Catalog

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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.

Table of contents

Introduction:

The HST 300U Hydraulic Refilling Trolley is a mission-critical piece of ground-support equipment (GSE) purpose-built to streamline and safeguard hydraulic servicing on military aircraft. Maintenance crews face stringent requirements when topping off and purging fluid from complex actuator and reservoir networks on platforms ranging from high-performance fighters to heavy transport and rotary-wing aircraft. By uniting three specialist subsystems—nitrogen-driven pressurization, vacuum-based de-aeration, and multi-stage 3 µm absolute filtration—into one compact, towable unit, the HST 300U ensures that every drop of OM-15, DTD-585 or MIL-H-5606 oil is delivered free of particulates, water and entrained air, preserving component integrity and extending service life Detailed.

Mounted on a robust, powder-coated steel chassis rated IP54 for dust and splash protection and fitted with puncture-proof pneumatic tires, the trolley offers effortless manoeuvring across airfield aprons and rapid hookup via quick-disconnect aircraft adapters. Operators control flow (up to 100 L/min) and pressure (up to 300 bar) through an intuitive gauge cluster with step-wise selector switches, while a digital vacuum readout confirms de-aeration down to 200 mbar abs. Built-in safety features—including redundant relief valves, burst discs, over-temperature shutdown and an emergency-stop circuit—protect both personnel and critical systems. Compliant with MIL-STD-810G, ISO 11120 (gas cylinders) and ISO 4406 (fluid cleanliness), and augmented by a supplementary 7 bar compressed-air outlet for pneumatic tools, the HST 300U minimizes aircraft downtime, reduces fluid waste and enhances operational readiness whether in hangar, depot or austere forward environments

System Overview:

The HST 300U's structural backbone is a heavy-duty welded tubular-steel chassis, meticulously engineered from 40 × 40 × 4 mm and 75 × 40 × 5 mm sections to support both the twin-chamber SS 304L oil reservoir (2 × 70 L) and all ancillary subsystems. This robust frame is mounted on four puncture-proof pneumatic tires—two of which are swivel casters—enabling maintenance crews to effortlessly manoeuvre or tow the unit across tarmac at speeds up to 24 km/h without risking flat tires or structural fatigue Detailed.

All hydraulic and pneumatic connections employ a modular plumbing suite designed for rapid, foolproof hookups. Quick-disconnect aircraft adapters and JIC-style couplings simplify attachment to aircraft service ports, while color-coded, braided-steel hoses resist kinking, abrasion, and thermal degradation under repeated field use. An ergonomic spring-retract hose reel ensures that each line stows neatly after operation, reducing trip hazards and preventing hose damage during transport or storage Detailed.

Centralized at waist height on the front panel, the HST 300U's control console brings every operating parameter within clear view and fingertip reach. Two large, glycerine-filled gauges display hydraulic pressure (0–400 bar) and vacuum level (down to 200 mbar abs.), while selector switches allow precise adjustments in ±1 bar increments. A separate flow selector governs delivery rates up to 100 L/min per circuit, and a sight-glass tank indicator keeps oil levels under continuous surveillance—minimizing overfill risk and ensuring consistent, repeatable servicing cycles Detailed.

Recognizing the extreme conditions of both hangar and forward-deployed maintenance, all wetted components and external enclosures are treated with a corrosion-resistant powder coat and sealed to IP54 standards. This protective finish, combined with carefully selected seals and gaskets, ensures reliable operation in ambient temperatures ranging from –20 °C to +55 °C and guards against both dust ingress and water spray during monsoon-season airfield operations

Key Features:

- Dual-System Capability: Independently service two hydraulic circuits, halving turnaround time.
- Vacuum-Based De-Aeration: Engine-driven pump extracts air/moisture to <200 mbar abs., preventing cavitation.
- Precision Pressure Control: Relief valves and selector switches for stepwise (±1 bar) pressure tuning; needle-valve flow regulation.
- High-Efficiency Filtration: 3 µm absolute filters in bypass & mainline achieve ISO 4406 cleanliness 18/16/13 or better.
- Integrated Compressed-Air Supply: 7 bar @ 100 L/min with coalescing pre-filters for pneumatic tools.
- Safety Systems: Redundant relief & burst discs (nitrogen 180 bar; hydraulic 350 bar), over-temperature shutdown, E-stop.

Main Components:

- Reservoir & Cylinders: Twin-chamber SS 304L oil tank (2×70 L) with baffles; nitrogen carriage (2×50 L @ 220 bar) Detailed.
- Filtration & De-Aeration: Primary 3 µm filters; diaphragm vacuum pump with oil-mist eliminator Detailed.
- Valves & Regulators: Panel-mounted pressure reducers (0–300 bar); needle valves; solenoid isolation valves.
- Gauges & Indicators: Dual 100 mm glycerine-filled pressure gauges (0–400 bar); sight-glass level indicator (5 L gradations) Detailed.
- Hoses & Reels: Two 10 m × ½″ braided-steel hoses with quick-release adaptors; heavy-duty spring-retract reel.

Technical Specifications:

Parameter	Specification
Dimensions (L×W×H)	1 600 × 1 000 × 1 200 mm
Weight (Empty/Full)	320 kg / 445 kg
Oil Capacity	140 L (2×70 L)
Nitrogen Supply	2×50 L @ 220 bar
Max Hydraulic Pressure	300 bar continuous; 350 bar relief
Flow Rate	100 L/min per circuit
Vacuum Level	Down to 200 mbar abs.
Air Supply	7 bar @ 100 L/min
Filtration Rating	3 µm absolute
Temperature Range	–20 °C to +55 °C
Mobility	Towable at 24 km/h; manual < 5 km/h
Protection	IP54 enclosure
Standards	MIL-STD-810G; ISO 11120; ISO 4406

Applications:

- Aircraft Hydraulic Servicing

  The HST 300U excels at topping off and purging hydraulic circuits on a wide range of combat and transport aircraft. For fighters like the Su-30 MKI, its high-flow capability (up to 100 L/min) allows rapid replenishment of actuator manifolds and accumulator bottles between sorties, while its precision pressure control prevents over-pressurization of sensitive servo valves. On heavy transports such as the C-17 Globemaster, the trolley's large 140 L reservoir and dual-circuit plumbing enable simultaneous servicing of multiple systems—reducing ground time and optimizing sortie generation rates. Rotary-wing platforms (e.g., AH-64 Apache) benefit from the unit's vacuum de-aeration stage, which removes entrained air to below 200 mbar abs., safeguarding against cavitation in low-pressure return lines.

- Hydraulic Test Benches

  In production and depot environments, the HST 300U can serve as both a primary fluid supply and a contamination-control module for ground-based test rigs. Its integrated 3 µm absolute filtration ensures that oil circulated through impulse and endurance test benches meets ISO 4406 cleanliness standards, protecting delicate servo valve and cylinder assemblies during validation cycles. Modular quick-disconnects and JIC couplings allow bench operators to reconfigure feed and return lines in minutes, streamlining transitions between different test fixtures. The built-in compressed-air outlet further supports pneumatic actuation of auxiliary devices (e.g., valve exercisers) without the need for separate compressors.

- Field & Expeditionary Use

  Designed for forward-deployed units and expeditionary maintenance teams, the HST 300U combines ruggedness with ease of transport. Its powder-coated, IP54-rated enclosure withstands dust, moisture and salt-spray environments, while puncture-proof tires ensure mobility over uneven terrain and airfield surfaces. The compact chassis fits through standard hangar doors and onto tactical transport vehicles, enabling rapid relocation between FOBs or remote landing zones. An on-board emergency-stop and over-temperature shutdown protect operators working in austere conditions, and minimal maintenance requirements (filter change every 500 h; vacuum-pump service every 1 000 h) keep sustainment footprints low.

Safety & Compliance:

- Over-Pressure Protection

  To guard against accidental over-pressurization, each pressure circuit incorporates redundant relief valves set just above the nominal operating point (nitrogen at 180 bar; hydraulic at 350 bar) and mechanically-rated burst discs that safely vent to a designated drain pan. Pressure-switch interlocks inhibit pump operation if pressures exceed safe limits, and a manual emergency-stop button instantly isolates all gas and fluid supplies.

- Environmental Resilience

  All external panels and the reservoir interior receive a corrosion-resistant powder coat; seals and gasket materials are selected for compatibility with hydraulic fluids and aviation-grade greases. The trolley's IP54 rating certifies protection against dust ingress and splash-water, ensuring uninterrupted performance in monsoon-prone or sandy environments. Component testing under MIL-STD-810G validates operational integrity across –20 °C to +55 °C, including shock, vibration and thermal-cycling stresses.

- Regulatory Certifications

  Gas cylinders conform to ISO 11120 and ADR transport regulations, with embossed traceability markings and proof-testing to 1.5× service pressure. The overall assembly meets ISO 4406 cleanliness requirements and has been qualified per MIL-STD-810G for shock, vibration and humidity. All electrical and control systems carry CE marking, and documentation packages include third-party material certificates and calibration reports.

- Training & Maintenance

  Neometrix provides a comprehensive operator's manual covering start-up, shutdown, leak-check procedures, and routine maintenance schedules. Standard service intervals include replacement of the main and bypass filters every 500 hours and a full vacuum-pump overhaul every 1 000 hours; consumables kits (filters, seals, gaskets) are available for rapid field change. On-site commissioning and hands-on training can be arranged, ensuring maintenance crews achieve proficiency in safe, efficient operation.


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