

# Dry Screw Vacuum Pumping Systems for pumping flammable vapors and gases made by Vacuum Pumps America Inc.



Today's chemical, pharmaceutical, biochemical, refineries, research and manufacturing plants demand vacuum systems in many processes. Vacuum Pumps America Inc. developed Stainless Steel Dry Screw Vacuum Pumps and Stainless Steel Dry Screw Vacuum Pumping Systems that can handle all types of condensible, flammable, corrosive vapors and gases. Our VPA-VSS-SUS Stainless Steel Dry Screw Vacuum Pump is CIP and GMP compatible and can be installed inside the hazardous areas and manufacturing facilities. Our vacuum process systems are very compact and have very small foot print as well.



VPA-VSS60/Ex/SUS/SYS Process Vacuum Pumping Station with Explosion Proof Motor, Water Cooled Heat Exchangers, Reservoirs, Inlet and Exhaust Nitrogen Gas Purge valves, cooling water control and temperature controls.



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Vacuum Pumps America Inc. commitment to excellence by providing safe, reliable, low cost and efficient systems for the provision of the vacuum conditions essential for our customers processes. Nowadays many manufacturers are turning to our stainless steel dry vacuum pump technology made by Vacuum Pumps America Inc. to meet their needs.

Robust and non-contacting stainless steel dry screw technology in combination with vertical cantilever design provides completely dry and super clean vacuum environment for many sensitive pharmaceutical, bio-tech, chemicals and research facilities without any back contamination to the process system. Low housing temperature allowing a comprehensive range of solvents, flammables and corrosive gases to be pumped.

VPA-VSS/Ex/SUS-SYS stainless steel dry screw vacuum pumping system, is the only all stainless steel dry screw vacuum in the market that can provide super clean and unique vacuum solution needed to successfully drive very sensitive processes in manufacturing Vaccines, Antibiotics, Radioisotopes and all other range of products.

### **Excellent performance characteristics:**

- Continuous operation from atmosphere to ultimate vacuum.
- Stainless steel construction makes our VPA-VSS/Ex/SUS, CIP and GMP compatible with very small foot print.
- Capable of reaching  $3 \times 10^{-3}$  mbar by just single stage screw rotors.
- Excellent temperature control by using precise thermometers at inlet and exhaust of the vacuum pumping system.
- Large amount of vapor handling capacity by use of counter flow heat exchangers in case of high temperature vapors. present in processes chambers. All heat exchangers are connected to stainless steel receivers to collect condensibles.
- Capable of pumping all types of flammable gases and Low auto-ignition temperature gases compatible to T6 requirements.
- Capable of pumping aggressive and Corrosive gases
- Capable of pumping Hydrogen and Deuterium.
- No effluent generated by VPA-VSS-SUS vacuum pumps.
- Efficient solvent recovery by installing traps and heat exchangers at the exhaust.
- Capacities available at 60m<sup>3</sup>/h, 100m<sup>3</sup>/h, and higher in combination with Roots vacuum pumps.
- Very Low cost of ownership.
- On-site cleaning of housing and screws that are totally compatible with CIP and GMP requirements.
- Flushable with water, solvent or steam.

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The unique features of our VPA-VSS/Ex-SUS-SYS have led to a situation where our dry vacuum pumps are now the preferred technology across a range of industries and market segments, including:

Bio-Tech, Pharmaceutical, Fine Chemicals, Oil & Gas, Specialty Chemicals, Petrochemicals, Oleochemicals, etc.....


Dry pump technology is used over a wide range of applications, from bench scale, lab tests, through pilot scale and API contract manufacturing to full scale process plants. Typical applications where dry vacuum pumps are used nowadays are: Crystallization, Deodorization, Desorption, Distillation includes: molecular and short path, Drying includes: filter & freeze drying, Evaporation, Filtration, Per-evaporation, Polymerization, Reactor service, Solvents and Solvent recovery, Sterilization with Ethylene Oxide or Hydrogen Peroxide.

## System design

**Vacuum Pumps America Inc.** considers all aspects of our customer process to satisfy their needs. We consider many factors to ensure Safety, efficiency and reliability of vacuum system to deliver for use in any specific application. Factors considered in designing the system include but are not limited to:

- Process parameters like: Pressure, Temperature, Volume, Type of gases, Flammability, Cleanliness, Material selection and Design.
- Equipment and instrumentation selection based on process and customer needs.
- Vacuum gauges and control systems
- Reliability and safety
- Commissioning and installation
- Operation and Qualification

The above considerations will typically include a dry pump system with a series of accessory modules including:

- Gas purges: To dilute flammables and extend seal life. Also safe transferring flammable gases to the exhaust and abatement systems.
- Safety devices, solvent flush, inlet isolation valves, flame arrestors.
- Heat exchangers, Traps and Recovery vessels for solvents or other fluids.
- Mechanical boosters, to increase pumping speed up to 1200 m<sup>3</sup>/h or more.
-  Explosion proof electrical panels according to NEC or ATEX derivatives.

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