Large Power Transformers

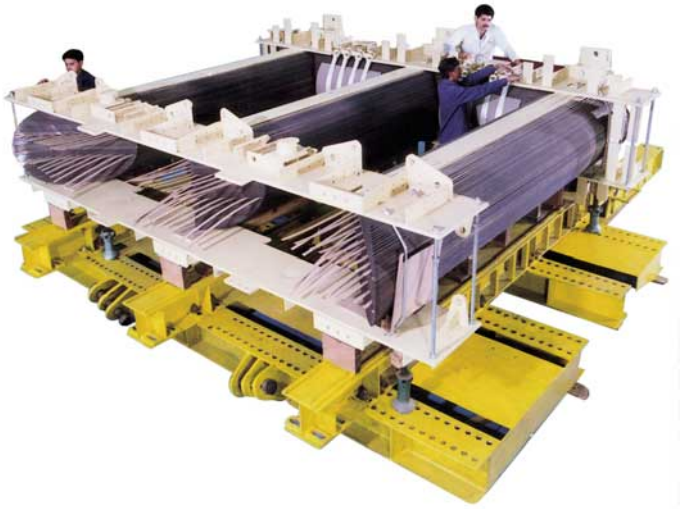
utility | industrial | commercial

Individual solutions | from a global perspective.

VIRGINIA TRANSFORMER CORP

www.vatransformer.com

What you need. Where you need it. When you need it.



When you choose Virginia Transformer Corp (VTC) as your supplier for large power transformers and related products, you can be certain you'll receive a product that is expertly designed, manufactured, tested, installed and serviced. Our design staff engineers high-quality, efficient, long-life units with turnaround times unparalleled in the industry.

In addition to our top-quality products, exceptional customer service and quick turnaround, VTC offers a total commitment to individualized solutions. We optimize our designs to meet your unique application and loss requirements.

Over the years, VTC has successfully grown our product line and capabilities to meet the needs of our ever-expanding customer base. We now offer our utility, industrial and commercial clients a product range from 300 KVA to 300 MVA in liquid filled units with primary voltage to 230 KV.

PLANNING OUR BUSINESS AROUND YOURS

We started our business in 1971 with only one manufacturing plant at our Roanoke, Virginia, headquarters. By the early 1990s we needed to expand our capacity to meet market demand. So in 1995 we added an additional facility in Chihuahua, Mexico.

In 2003, we expanded yet again when we acquired the assets of US Transformer-West in Pocatello, ID. This new addition, VTCU, gives us the ability to manufacture Large Power Transformers right here in America. VTCU came with a select staff of highly knowledgeable and skilled personnel ready to build your new transformer.

WHEN YOU NEED IT, MAYBE EVEN SOONER

Fulfilling an order for a large unit on a tight timetable is our specialty. With our investment in additional manufacturing capabilities, we can offer shipment of large transformers in 24 to 32 weeks — an unheard of turnaround time in the industry. When VTC won the contract for two 30 MVA 132 KV transformers from Ionics Resources in Washington, we were asked to fulfill the order in a timeframe of under 28 weeks. The transformers were delivered to port on schedule for Ionics' Trinidad desalinization plant. We then provided oversight of installation and commissioning to the firm's complete satisfaction.

APPLICATIONS

- Distribution
- Generator step up
- Load tap changing
- Grid tie
- Auxiliary
- Zig-Zag Grounding
- Single Phase
- Substation
- Exciter
- Motor starting
- Drive isolation
- Rectifier
- Wye-Wye
- Reconnectable LV, HV

RELIABLE BY DESIGN

At VTC we know that our customers value reliability, efficiency and long life. When designing a large power transformer, VTC engineers not only consider the special requirements of its application, but also totally commit to meeting or exceeding customer expectations.

SUPERIOR MECHANICAL STRENGTH

We design our transformers to withstand the forces they encounter during operation.

- Circular core and coil design* ensures the best inherent withstand to short-circuit forces.
- Cores are clamped with tie plates to ensure rigidity and minimize losses.
- Coils are clamped to brace them against axial forces using properly sized pressure rings, which are mechanically linked to tie plates and brackets.
- Use of pre-compressed insulation ensures dimensional stability over the long term.
- Pressing of coils aids precise balancing of electrical height and ampere-turns of coils to minimize forces.
- Computerized magnetic field plotting is utilized to design for impedance, losses and electromagnetic forces.
- The core and coil assembly is hydraulically pressed at pre-calculated forces, and then tightened with pressure screws.
- Advanced computer programs, such as “Andersen programs,” are used to evaluate designs for electrical field and magnetic forces.
- For very large transformers, 5-leg cores can be utilized to reduce height.

*See our paper “The Performance Advantages of Circular Windings” on our website.

FORTUNE 500 FOLLOWING

Our focus on individualized solutions, quality products, and exceptional service has earned VTC business from many Fortune 500 firms. General Electric Company, for example, was one of our first large power transformer customers. In 1997 GE purchased a 10 MVA, 138 KV transformer for the Degussa Semiconductor Complex substation in Ohio. Top companies like General Motors, Caterpillar, National Steel and Rubbermaid along with Utilities such as American Electric Power, Georgia Power, Alliant Energy, Rappahannock Electric Co-op, Alaska Electric Light & Power and Kansas City Power & Light have also looked to us to meet their transformer and related product needs. Whether big or small, companies have learned to rely on VTC as the best choice.

Our quality lies in the details.

SUPERIOR ELECTRICAL STRENGTH

Our design engineers have a precise understanding of voltage stresses at different parts of the windings and an extensive knowledge of proper dielectric materials to withstand those stresses.

- High voltage windings are disc-wound and are also very strong mechanically.
- Use of interleaving and/or intershield shielding improves impulse voltage distribution.
- Properly shaped and profiled angle rings and molded insulations are used to best withstand creepage and puncture stresses.
- Conductors are wrapped with high-quality, thermally upgraded, stable paper.
- Coils are wound in a temperature and humidity controlled, dust-free environment.
- Vacuum drying process is used to expedite the drying process.

OPTIMAL ENERGY EFFICIENCY

To maximize efficiency for our customers, we utilize the best materials and design techniques.

- Conductors are transposed in the coil or by using continuously transposed cable (CTC) for minimum load losses.
- Core (no-load) losses are minimized by using cold-rolled grain-oriented silicon steel laminations, coated with high-resistance, high-temperature inorganic material, which is also corrosion resistant. The lamination grade is chosen to optimize losses. For lowest losses, as well as lowest sound levels, H1-B and laser-scribed steel are available.
- Cruciform cores incorporate mitered joints and/or small increment step-lap construction to minimize losses and sound levels.
- Proper selection of conductor size reduces eddy losses in windings.
- Perfect ampere-turn balancing reduces stray losses and forces.
- VTC optimizes energy efficiency in design for any given level of loss evaluation.

DETAILED THERMAL DESIGN

We ensure long unit life by maintaining the appropriate temperature rise and hot spots within our design limits.

- Adequate thermal margins are ensured by accurate prediction of winding temperature rises through detailed design calculations.
- Coils are designed with ample cooling ducts appropriately oriented for maximum evacuation of heat from the coils.
- Radiators are designed for natural and forced cooling by fans and/or pumps.
- Special design consideration is given for single-stage and double-stage fan cooling.

TRUE TURN-KEY SOLUTIONS

Customers for large power transformers depend upon their suppliers not only for a quality product, but also for on-site construction, installation and commissioning. The City of Wyandotte in Michigan expressed delight with VTC for their management of offloading, dressing out and commissioning of a 25MVA Load Tap Changing transformer supplied to expand substation capacity. Our total focus on meeting customer needs from design and manufacturing to installation and preventative maintenance service may go beyond expectations for some. To VTC, it's simply the only way to do business.

HIGH-QUALITY TANKS AND RADIATORS

- Welded tanks and panel-type, cold-rolled steel radiators are subject to pressure testing ensuring freedom from leaks.
- Tanks are shot blasted for best paint adhesion, then coated appropriately for the application.
- Tanks are provided with facilities for lifting, skidding, rolling or jacking.
- Tanks are either sealed type, or provided with conservators.

YOUR CHOICE OF ACCESSORIES

From standard tap changers and gauges to on-load tap changers and annunciators, VTC offers our customers the accessories they want and need for the protection, operation and maintenance of their systems.

DETAILED DOCUMENTATION

VTC provides our customers with detailed, customized drawings and schematics, thorough operation and instruction manuals, and comprehensive test reports.

QUALITY FROM START TO FINISH – AND BEYOND

Whether your unit ships from VTC headquarters in Roanoke, VA, VTCU in Pocatello, ID, or VTC West in Chihuahua, Mexico, you can rely on VTC's highly skilled technicians to provide all on-site erection and commissioning services, from oil processing and filling, to warranty and preventive maintenance services. All of our technicians are fully versed in transformer manufacturing and testing procedures and are equipped with a fully fitted rig for on-site installation, testing, maintenance and service.

VTC service is literally at your fingertips 24 hours a day, 7 days a week with a call to our dedicated toll-free service hotline – 800-882-3944.

Full Range Product Line

LIQUID FILLED TRANSFORMERS –
to 300 MVA, 230 KV Class

AUTOMATIC LOAD TAP CHANGING (LTC) TRANSFORMERS – to 300 MVA, 230 KV Class

VOLTAGE REGULATORS – to 46 KV Class

REPAIR OF TRANSFORMERS –
to 200 MVA, 230 KV Class

DRY TYPE TRANSFORMERS –
to 15 MVA, 35 KV Class

UNICLAD® TRANSFORMERS –
to 15 MVA, 35 KV Class

DRIVE ISOLATION TRANSFORMERS –
Dry Type or Liquid Filled

RECTIFIER DUTY TRANSFORMERS –
Specialty Applications, including RI-9

LOAD BREAK SWITCHES
to 35KV Class

GENERATOR STEP-UP TRANSFORMERS

AUXILIARY AND STATION TRANSFORMERS

AIR AND IRON CORE REACTORS –
Indoor or Outdoor, Open or Enclosed to 15KV Class

THE VT FAMILY OF BUSINESSES

Corporate Headquarters, Roanoke, VA

Pocatello, ID

Chihuahua, Mexico

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