VIRGINIA - GEORGIA TRANSFORMER
ONE SOURCE–ONE COMMITMENT

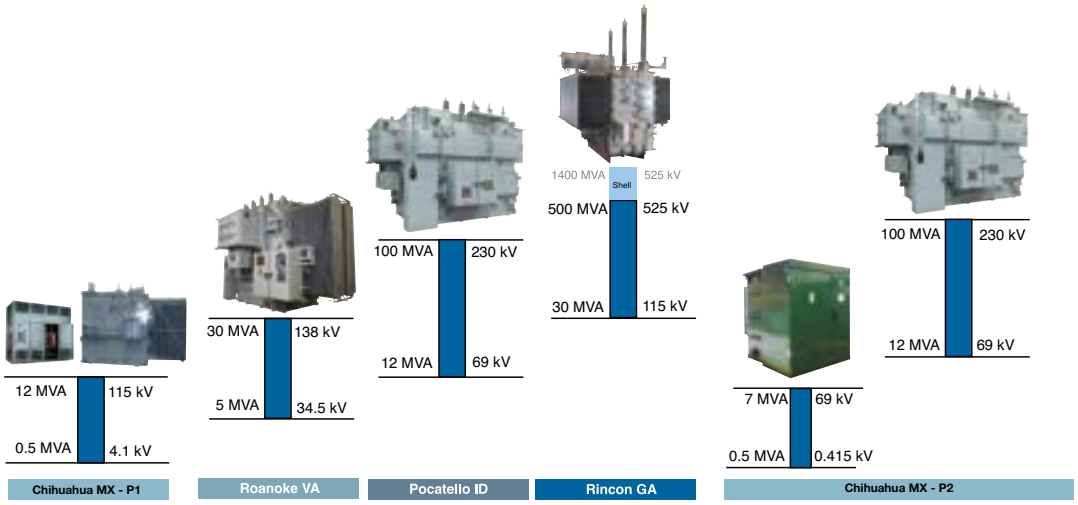
RELIABLE SOLUTIONS
DATA CENTERS

SIX (6) MANUFACTURING PLANTS IN NORTH AMERICA

The data center industry is constantly evolving and looking for ways to increase energy efficiency, and reliability. With issues like surge protection, operational life, efficiency and installation footprint, finding a power solution can be challenging. Transformers are one of the most critical pieces of equipment in the power distribution chain for data centers. A transformer steps down voltage from the grid in multiple steps to the voltage required to power the data center servers.

APPLICATION

Since 2000, Virginia Transformer has installed hundreds of units to data centers across North America with no critical failures. Our newest solution, E2D, is specifically designed for data center application addressing the need for reliability, long operational life, efficiency, and small installation footprint. These products are built by experts with proven technology. Virginia Transformer will design the optimum transformer for your data center while keeping our commitment to
providing the shortest lead times in the industry.



PRODUCT RANGE

- Up to 400 MVA 525 kV
- BIL 1675 kV
- LTC / DETC
- Medium Power Transformers
- Large Power Transformers
- GSU Transformers
- Auto-Transformers
- Padmount Transformers
- Traction Transformers
- Rectifier Transformers
- Dry-Type Transformers

Harmonics

What makes data centers different from regular facilities is the use of a significant amount of electronics. As these electronics run in a data center, the continuous and rapid switching of these devices causes distortion of the normal sinusoidal wave, which could be equated to overlay of multiple sinusoidal waves with frequency in multiples of power frequency. This phenomenon is called harmonics. A side effect of harmonics is extra losses, which cause heat generation and hence affect the life of the transformer. The data center transformers should be built to handle such complex loadings.

SUITABLE TO HANDLE HARMONICS

SUSTAINABILITY BIODEGRADABLE OIL

Noise

Noise can also affect the operational life of the transformer and disrupt the local environment. Sound and noise comes from friction. Noise from a transformer comes from different sources, such as the core and windings inside the transformer and the fans used to cool the transformer. The transformer core is made up of thin laminations of silicon steel material. This magnetic material under energized conditions causes vibration due to the magnetostriction effect. These vibrations are passed on to the coils, oil, and tank parts. In addition, there are vibrations in the coils due to flow of current. These vibrations generate noise. When designing data center transformers, core weight, insulation design, and size must be optimized for low vibrations. Lower vibrations reduce noise, resulting into longer life. At Virginia Transformer, we use low-noise fans and design units to be up to 12 decibels lower than the NEMA standard. Our goal is to minimize noise and maximize the transformer's lifespan.

FOOTPRINT

Regardless of application or indoor or outdoor placement, the closer you bring load to your electrical system, the more efficiently it will operate. Locating transformers close to the actual load also reduces installation costs and can help prevent power disruption. Transformers must be designed to seamlessly handle transition from the incoming power supply without any disrutpion in output services or distribution.

Liquid-Filled Transformers

Liquid-filled transformers, such as E2D, have more efficient material for the core and coils and use highly effective cooling systems, which allow them to be small in physical footprint and weigh less than other types of transformers. Various types of fluids can be used to insulate and cool the transformers, including less-flammable fluids, nonflammable fluids, mineral oil, and Askarel. Liquid-filled transformers run more efficiently because of the cooling and insulating properties associated with the oil-and-paper dielectric system and tend to have lower losses. The units are easily recycled after they have reached the end of their useful life, as the steel, copper, and aluminum are recyclable.

Maintenance for a liquid-filled transformer consists of drawing and analyzing an oil sample. The oil analysis provides an accurate assessment of the transformer condition and allows for a scheduled repair or replacement rather than an unforeseen failure. Although oil sampling is not required for general operation and does not affect efficiency, it will provide valuable information, leading to scheduled repair or replacement, and minimize the duration and expense of an outage.

The fluid used in transformers performs two functions, acting as a dielectric and cooling mechanism. The choice of liquid is based on combined performance of both while mitigating any fire risks.

Liquids with a high flash point represent a reduced fire hazard and their use in transformers resluts in lower insurance rates. For outdoor installations, fire hazards are less severe, so the choice of cooling fluid is broader.

Mineral oil has is the most common dielectric fluid in liquid-filled transformers. It has a longstanding record of good performance and lower cost. Mineral oil is also ideal for outdoor installations due to overall cost effectiveness for procurement and maintenance.
For indoor use, Envirotemp FR3 by Cargill or VT300-Natural Ester Oil by Virginia Transformer, is preferred.

These oils are made from soy-based natural esters and have good dielectric properties. Their high flash points meet the requirements of less-flammable oil, reducing the risk of fires. These fluids are also bio-degradable, non-toxic, and environmentally friendly.

Dry-Type Transformers

Virginia Transformer first began producing dry-type transformers in the 1970s. Over the years, we have refined our design and technology enabling us to manufacture dry-type transformers from 300 kVA to 20 MVA up to 35 kV class. Applications for dry-type transformers range from commercial buildings, airports, hotels, industrial plants, mines, and data centers. Virginia Transformer dry-type transformers are built to withstand the toughest environments. We use aluminum conductors, temperature-controlled winding rooms, superior insulation, and special harmonics handling to produce reliable transformers with the lowest core losses.

Virginia Transformer Corp					Georgia Transformer
1936 Blue Hills Drive Roanoke, VA 24012 USA Phone: 540.345.9892	220 Glade View Drive Roanoke, VA 24012 USA Phone: 540.245.9892	3770 Poleline Road Pocatello, ID 83201 USA Phone: 208.238.0720	**P1** Complejo Industrial Chihuahua. Ave. Homero #3307, Chihuahua, MX Phone: 52.614.483.0000	**P2** Avenida de las Industrias 6899 Nombre de Dios, Chihuahua, Chih. Phone: 52.614.483.0000	2789 Highway 21 South Rincon, GA 31326 USA Phone: 912.754.5300