

## POWER TRANSFORMERS

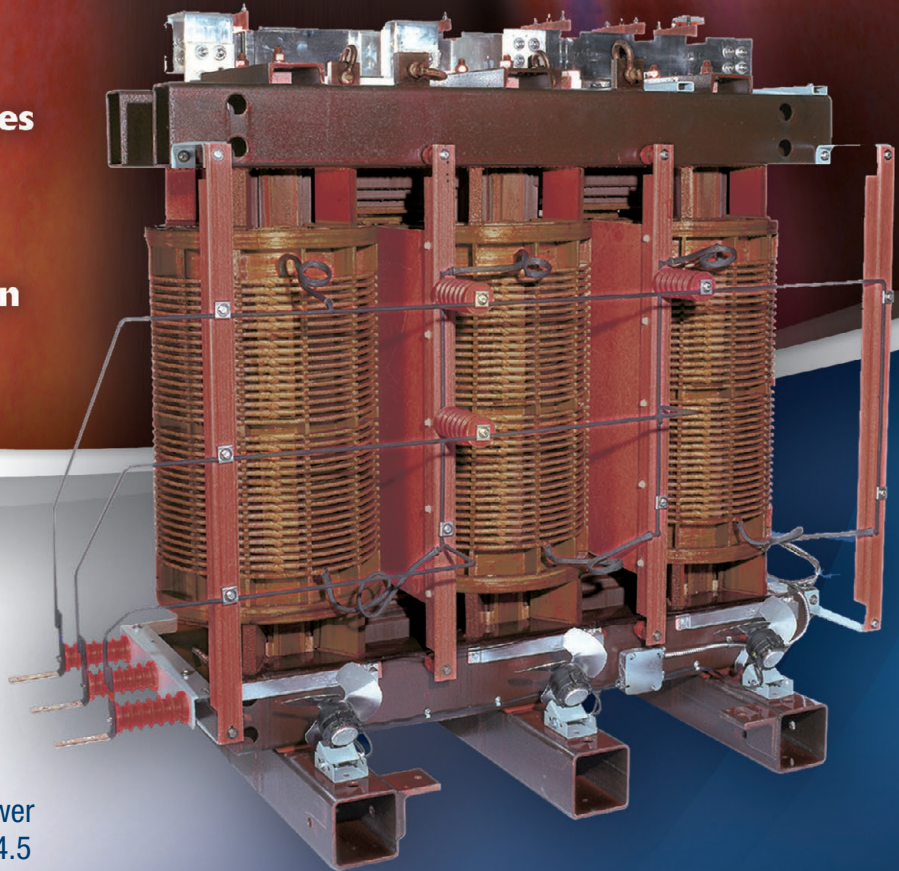
**Pulp and Paper**

**Utilities and Municipalities**

**Mining**

**Petrochemical**

**Commercial Construction**



Delta Transformers specializes in the design and manufacture of Dry Type Power transformers of up to 15,000 kVA and 34.5 kV class. With its modern plant and equipment, Delta Transformers caters to all your power transformer needs.

Delta Transformers power transformers are ideal for industrial, institutional and commercial applications.



SYNONYMOUS WITH QUALITY

## Performance and Value

Delta Transformers has the ability to generate new and creative solutions to meet the changing needs of the industry. With over 150 years experience in special application transformer design, our engineers can meet your most demanding application requirements.

Quality material, safe construction, conservative designs backed by our quality assurance program ensure trouble-free performance for the life of the transformer. Quality fabrication with proven insulation materials and testing with state-of-the-art equipment assures reliability and safety.

Optimized computer design systems are used to analyse dielectric, magnetic and thermal effects to maximize the life of your transformer. Automated drafting is used for design accuracy.

From design to approval for shipment, integrated MRP and scheduling systems coupled with our flexibility, ensure on-time delivery.

### FACILITIES

Our manufacturing plant with power transformer building capacity, located in Granby, is fully integrated and equipped to handle special requirements and coordination from engineering to shipping.

### SERVICE ADVANTAGES

- Quick on-time delivery
- Troubleshooting, repair, field support
- Service and retrofit on all known brand names

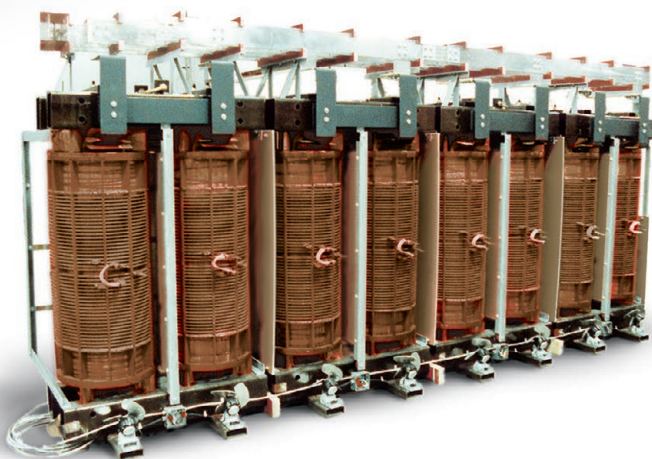
### RNCAN REGULATIONS

(Natural Resources Canada)

- Dry Type Transformers CSA C802.2-06

## Our Speciality is Flexibility

Our manufacturing methods  
allow custom designs  
for special needs.



### OUR STANDARD PRODUCTS

VOLTAGE CLASS	MVA
5 kV	UP TO 15 MVA
15 kV	
34,5 kV	

## Our Product Range

Dry Type Power transformers up to 15,000 kVA and 34.5 kV class are offered with or without a wide range of enclosures suitable for indoor and outdoor installations.

Our Dry Type Power Transformer line, manufactured in Granby, Quebec facility complements the complete General Purpose transformer line offered by Delta Transformers.

We can design to meet the most demanding space and performance criteria to the latest ANSI, IEEE and CSA standards and latest NRCAN requirement efficiency.



## MECHANICAL CHARACTERISTICS STANDARD AND OPTIONS

### COOLING

Type ANN

### OPTIONS

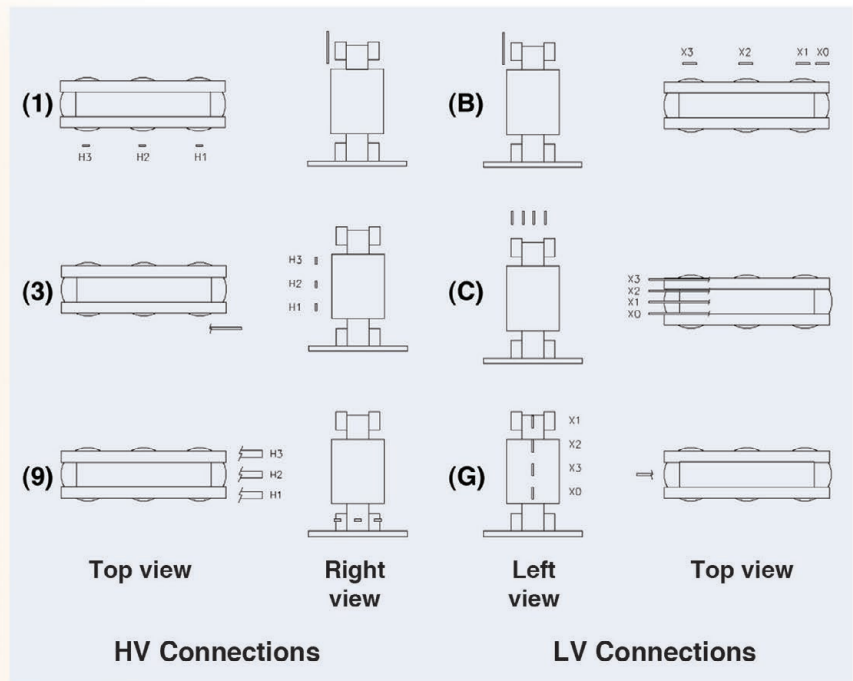
- a) AFN (fan-cooled);
- b) Provision for AFN.

### ENCLOSURES

Type 1, steel, ASA61 grey.

### OPTIONS

- a) Special color or finish;
- b) Front or rear access only;
- c) Doors with locks or mechanical interlocks.



## CONNECTION COORDINATION

Position of LV and HV outlets, based on combination 1B opposite.

### OPTIONS

- a) Possible combinations based on diagrams 1, 3, 9 (HV) and B, C, G (LV) with alternate outputs (left or right);
- b) Special dimensions for outputs and mounting holes on connections;
- c) Other connections may be available upon request and with specifications.

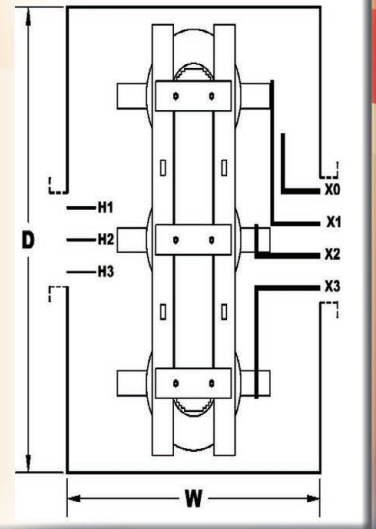
## OPTIONS AND ACCESSORIES

- Temperature probes in windings;
- Temperature indicators with 2 or 3 contacts;
- Fans;
- Control panel;
- Terminals, flexible connectors and other types for outputs;
- Provision for pads to facilitate moving;
- Lightning arrester;
- Grounding resistor;
- Electrostatic shield;
- Designed for use with rectifiers;
- Enviro-Guard®.

# Advantages of Dry Type Transformers

## BPC TRANSFORMERS REPLACEMENT

1. No oil as medium (other than air) for dielectric insulation;
2. Proven for decades of interior installations across Canada;
3. Solution for more than 95% of new installations following the regulations for the abolition of PCB's;
4. Liquid filled transformers for domestic use are no less expensive than dry type transformers... Liquid for domestic use is much more expensive than oil for outdoor transformers.... not the same liquid is used;
5. Delivery time usually longer for liquid filled transformers;
6. Maintenance program is more expensive (periodic checks of oils by specialized external firm);
7. Core and coils are much more accessible on a dry-type transformer;
8. A retention basin is required with liquid filled transformer;
9. Insurance for buildings is more expensive because of the liquid in a transformer: greater risks of loss and damage;
10. The concept of an oil filled transformer is not considered a solution in harmony with environmental protection;
11. The total cost of replacement of a PCB transformer by another liquid filled transformer is often more expensive if you consider all the extra infrastructure work (basin), insurance and maintenance costs;
12. Delta has successfully completed several projects to replace PCB filled transformers in recent years. Not too necessarily to compete head on with a liquid filled but on an environmental approach and long-term reliability, performance and lower maintenance costs;
13. The transformer enclosure is of a knockdown construction allowing for easy assembly and disassembly at their final locations on sites with restrictions;
14. In the majority of its projects, Delta was able to provide compact arrangements to meet the floor space available for these replacements;
15. Delta has achieved a high level of competence in the replacement of PCB transformers, including the site measurements and any technical assistance as needed.



REPLACEMENT  
OF BPC LIQUID FILLED  
TRANSFORMERS

SYNONYMOUS WITH QUALITY

## Performance First: E.V.I. at no additional cost

Every Delta Transformers transformer is epoxy vacuum impregnated (E.V.I.) at no additional cost.

The E.V.I. process features the following benefits:

- Increased mechanical strength;
- Reduced noise;
- Improved winding insulation;
- Superior partial discharge performance;
- Compatible with cast coil performance;
- Enhanced performance in heavily contaminated environments.

This resin-based product is an ideal coating agent.

In addition to their superior quality, transformers with E.V.I. have a longer life.



**The advantages of  
a cast coil without  
the inconveniences**



### Advantages of the Delta Transformers E.V.I. process

#### MECHANICAL

Both cast coil and Delta Transformers E.V.I. processes make use of epoxy as an environmental protection.

#### EPOXY ENCAPSULATION VS. EPOXY CASTING

In a cast epoxy transformer, the resin is the major part of the insulation system. In the Delta Transformers E.V.I., Nomex® and air are the insulation media; epoxy is used for its environmental protective properties only. The Delta Transformers E.V.I. gives improved performance since its encapsulation is not subject to cracking which is often related to solid epoxy casting.

## The Delta Transformers E.V.I. Epoxy

The Delta Transformers E.V.I. Power Transformers are recommended for use in very humid and hostile environments. Typical applications would be:

- automotive industry;
- pulp and paper mills;
- steel mills;
- mines;
- water treatment plants;
- chemical plants;
- cement plants;
- and other industrial locations where the atmosphere is especially humid, dirty and/or corrosive, including outdoor and marine applications such as shipyards and offshore drilling rigs.

## (E.V.I.) Epoxy Vacuum Impregnation

#### NO CRACKS

The Delta Transformers E.V.I. process has totally eliminated the cracking problems which could occur in a solid cast insulation, due to temperature differentials through the thickness of the resin and to thermal expansion of the coils. In the Delta Transformers E.V.I. design, the epoxy is thick enough to provide environmental protection but thin enough that internal stresses do not develop. Since the coils are self-supporting, it enables us to use a flexible form of epoxy which will accommodate the expansion and contraction of the coil which it protects.

#### INHERENTLY STRONG

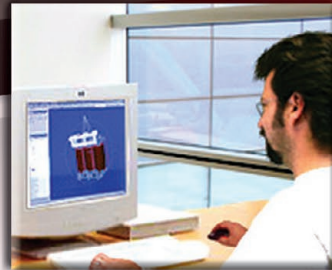
The Delta Transformers E.V.I. design is inherently strong and self-supporting. The Delta Transformers E.V.I. epoxy being highly flexible, it can endure thermal and mechanical stresses without cracking. In solid cast epoxy transformers, it is usually necessary to incorporate spring type pressure blocks and fiberglass reinforcements to combat stresses between components in order to minimize cracking.

#### ELECTRICAL

With the Delta Transformers E.V.I. design, as opposed to cast-coil, the epoxy resin is not part of the insulation system. Its function is purely mechanical: a great sealer to protect a great transformer. In fact, in the Delta Transformers E.V.I., the insulation media are Nomex® and air.



WE BUILD FOR THE FUTURE



## Our People: Your Partners

All of our employees are committed to producing the highest quality Dry Type transformers. Well-trained tradespeople combine their skills with those of qualified and experienced engineers, technicians and drafting personnel to design and manufacture highly efficient products that consistently meet customer requirements.

Our team's expertise in the design and manufacture of power transformers gives us the ability to create innovative solutions to application problems. Our success in the power transformer market confirms the ability of our people to deliver high-tech products on time.

Our experienced customer service team can help you and your clients with any technical or logistic issue at all times. Our before and after-sale service is second to none.



## Research and Development

Equipped with their own lab and specialized simulation software, our research and development engineers continuously work at improving designs, methods and materials.

Our R & D team will continue to offer our customers the most innovative solutions to their application problems.

## ENVIRO – GUARD®

OPTIMIZED EPOXY VACUUM IMPREGNATION  
FOR HARSH ENVIRONMENT

- Maximize sealing of windings and conductor leads.
- Improved resistance to shrinking and cracking during lifetime operation.
- Provide hydrolytic stability under electrical stress, environmental contamination or abrupt temperature variation.

**DELTA TRANSFORMERS Inc.**

SYNONYMOUS WITH QUALITY

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