

AECI Specialty Transformer

*Your Passport to Savings for all
of your small load applications!*

Product and Catalog Information

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1.0 Product Description

The AECI Specialty Transformer is a single phase, oil-filled, polemounted transformer. The product is designed for use by utilities in small load services as an alternative to larger, distribution transformers. Applications include service loads such as security lighting, street lighting, electronic reclosers, and capacitor banks.

1.1 Ratings

kVA	0.5 through 5.0 @65C Rise
HV	2400 through 36000v
LV	120 through 480v
Frequency	50 / 60 Hz

<u>Rated Voltage</u>	<u>BIL (kV)</u>
2160 – 2400v	60
4160 – 4800v	75
7200 – 12470v	95
13200 – 14400v	125
> 14400v	150 (125 kV available)

1.2 Product Configurations

Conventional

This transformer contains no protective equipment, either internally or externally. The purchaser must provide auxiliary protection.

Conventional with an internal weak link

This transformer contains an internal protective link to protect the system in the event of a coil failure.

Surge-protected

This transformer combines a tank-mounted lightning arrester with an internal protective link. The protective link protects the system from a coil failure but does not provide overload protection. The purchaser must provide overload protection.

1.3 Product Warranty

Each AECI Specialty Transformer is provided with a warranty to cover manufacturing defects and component problems. The product is covered for a period of one (1) year from the date of shipment.



2.0 Product Components

2.1 Coil Design and Construction

The transformer coil is manufactured using microprocessor-controlled coil winding equipment. The wire and epoxy-coated layer insulation are both added to the coil under tension to achieve a tight coil assembly. Pressboard ducts added to the coil design improve oil circulation and cooling.

2.2 Core and Coil Assembly

Constructed of higher grades of steel to minimize no load losses, the core design uses the same distributed gap design used by most transformer manufacturers.

After the core is assembled onto the coil, pressboard insulation is added to block voids in the assembly. This added insulation combined with the bonding of the layer insulation adds to the strength of the assembly in withstanding any short circuit forces that may be encountered.

2.3 Tank Construction

Constructed of mild steel, the tank is coated with a polyester powder coating to improve corrosion resistance. The surface conforms to ANSI Standards for salt spray resistance and other finish performance criteria.

2.4 Pressure Relief Valve

A pressure relief device that complies with ANSI C57.12.20-1988 is installed in the transformer.

2.5 Internal Protective Link

An internal protective link, provided in two of the available transformer configurations, protects the system from a coil failure but does not provide overload protection. The protective link, manufactured by the ABB Components Division of ABB Power T&D Company, is designed to follow Curve 2 of the ABB-published *Average Clearing Time-Current Characteristics* [Curve No. 735701] and the *Minimum Melting Time-Current Characteristics* [Curve No. 697700]. Copies of these documents are available upon request.



3.0 Production and Testing Information

3.1 Moisture Removal

Prior to installing the core and coil assembly into the tank, it is first placed in a dryout oven at 265 degrees Fahrenheit for 15 hours. This heating process removes moisture from the transformer insulation system and cures the adhesive on the electrical tape used in the windings. In addition, the process bonds the epoxy coating on the paper insulation to adjacent layer conductor to strengthen the coil structure and to help resist short circuit forces.

3.2 Vacuum and Oil Processing

The purpose of vacuum and oil processing is to achieve a dry and homogeneous insulation system within the transformer. The resulting high dielectric is necessary for safe and reliable operation of the finished transformer.

All oil introduced into each transformer is new, inhibited transformer oil that has been certified to contain less than 1 ppm PCB. The oil is vacuum processed and stored in vacuum storage tanks to insure a filtered, degassed, and dehydrated oil with a dielectric strength exceeding 30 kV (typically 50+ kV per ASTM D877).

Vacuum and oil filling is performed on the sealed and fully assembled unit. The cover and all gaskets are installed on each unit as soon as practical while the core & coil assembly is warm and above room temperature.

3.3 Final Testing Procedures

Each completed unit is subjected to a battery of final tests after the unit has been vacuum processed and filled with the new, degassed and dehydrated oil.

The standard battery of production line tests for the AECI Specialty Transformer includes the following:

- Applied Potential
- Induced Voltage
- Ratio Error and Polarity
- No Load Loss and Excitation Current



Impedance and Load Loss

Impulse Testing (performed for all models with rated voltage > 14400v)

All testing on the completed transformer is conducted at the full American National Standards Institute (ANSI) test voltage. Certified testing is available upon request.

4.0 Design Testing

The transformer design was tested in two phases. First, the initial testing was performed at a test facility to determine heat run, core loss and load loss values, and for basic lightning impulse insulation levels (BILs) for the various transformer designs.

The second phase of the design testing was performed at the A.B. Chance High Voltage Test Laboratory in Centralia, Missouri, USA. The following tests were performed:

Test Number 1 - An Arcing Fault in an Enclosure

Test Number 2 - For Enclosures with Internal Fusible Elements

The tests were performed in accordance with ANSI C57.12.20-1988. The design passed both Test Number 1 and the "A" Fault of Test Number 2. In the review of the particular characteristics of the transformer design, the testing laboratory deemed that the "B" Fault test was not applicable.

Results of the cover retention testing and the certification by the laboratory are available.



5.0 Constructing a Catalog Number

The catalog number for the AECI Specialty Transformer contains information regarding the kVA rating, primary and secondary voltages, and the configuration. To order a basic 1.5 kVA, 12470GRDY/7200-120/240V, 1 Bushing Conventional transformer w/ 1 hanger tank design, the catalog number would be constructed as follows:

103 - Y0111 - 1010 1.5 kVA, 12470GRDY/7200-120/240V, 1BU conventional transformer

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3 Design style :

3 = Standard 6 = 60kV Withstand (Hi-pot)
 A = Special application J = Low Impedance Design (for use
 L = Interlaced Coil Design w/ Joslyn VSV Switch)

- Y kVA rating code:

W = 0.5 Z = 3.0
 X = 1.0 1 = 5.0
 Y = 1.5

01 Primary voltage code:

0B = 2400	0D = 7970	0A = 13800	A7 = 22000	B1 = 35000
0W = 6640	A6 = 11000	05 = 14400	A9 = 24000	02 = 7200x14400
01 = 7200	0H = 11400	A8 = 19050	33 = 33000	22 = 8660x12700
03 = 7620	06 = 13200	21 = 19920	A5 = 34500	others ...

11 Secondary voltage code:

11 = 120/240v 13 = 277 A4 = 240v only
 12 = 240/480v 16 = 120v only

- 101 Configuration code:

101 = 1BU Conv
 10N = 1BU Conv w/ internal weak link
 149 = 1BU Conv in a two hanger tank
 14N = 1BU Conv w/ internal weak link, 2 hanger tank
 249 = 2BU conventional

0 Accessory Code :

0 = Basic (no special accessories)
 2 = 2 LV Bushing Configuration
 B = Wildlife protection (HV Bushing)
 P = 5 Pin LV Termination
 S = Stainless Steel Tank

Note : The addition of a lightning arrester to any transformer changes the configuration and accessory codes. Consult factory for available arresters.

6.0 Decoding a Serial Number

All AECI Specialty Transformers manufactured in the Little Rock, Arkansas facility utilize the same format for the manufacturer's serial number. The serial number (ten digits in length) can be decoded as follows:

0 0 0 3 Y 1 0 1 9 9

YYMM		-	Sequential Number of Production for that Year of Manufacture
		--	kVA and HV Code

In the above fictitious example, the transformer with serial number 0003Y10199 was manufactured during the 3rd month of 2000. It was a 1.5 kVA rated transformer with a 7200v HV rating, and was the 199th unit built that year (2000).



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