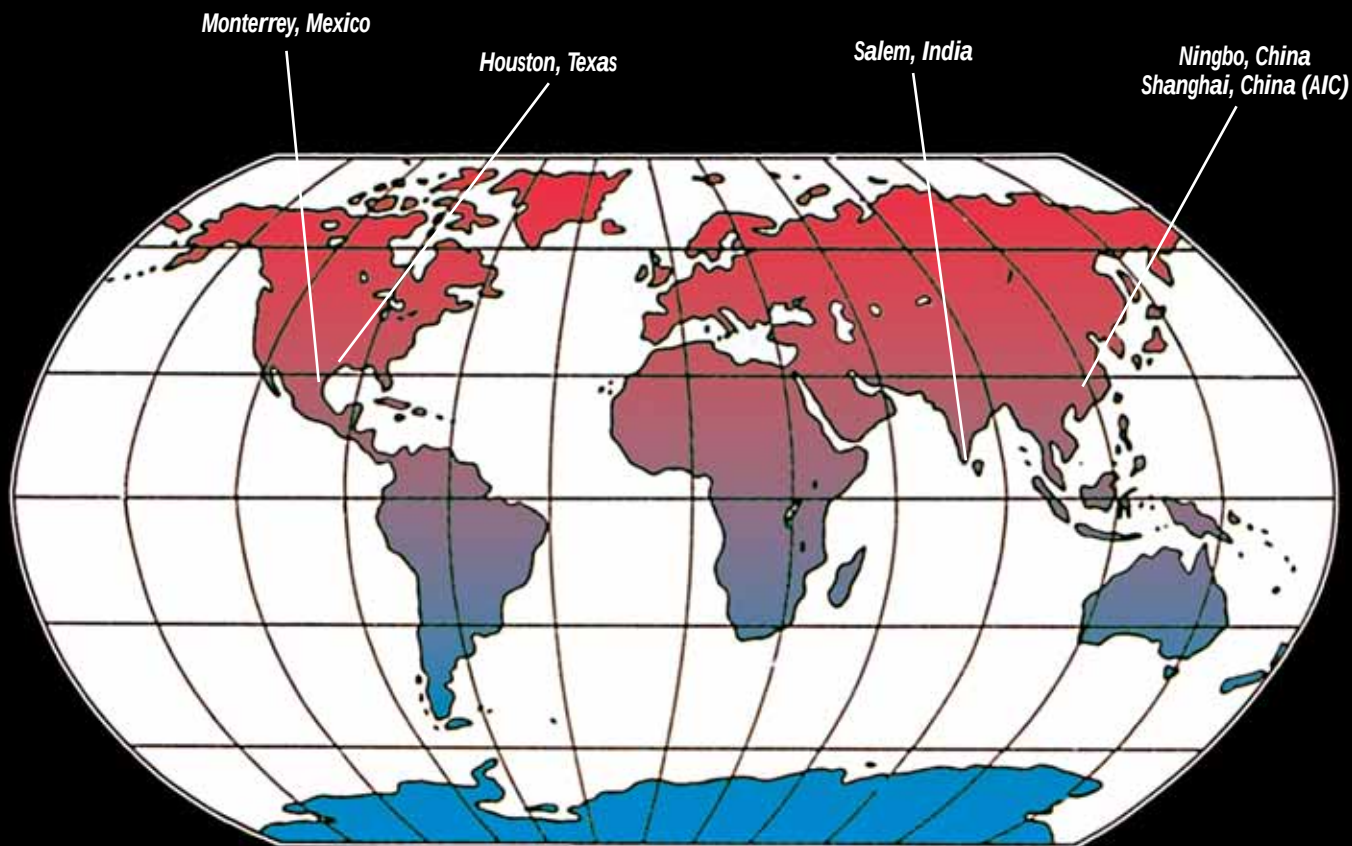
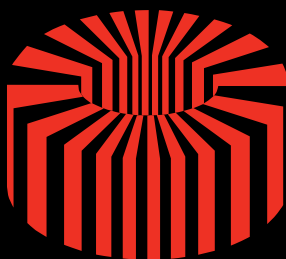
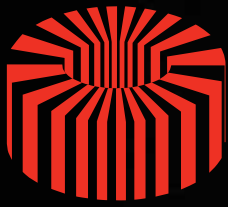




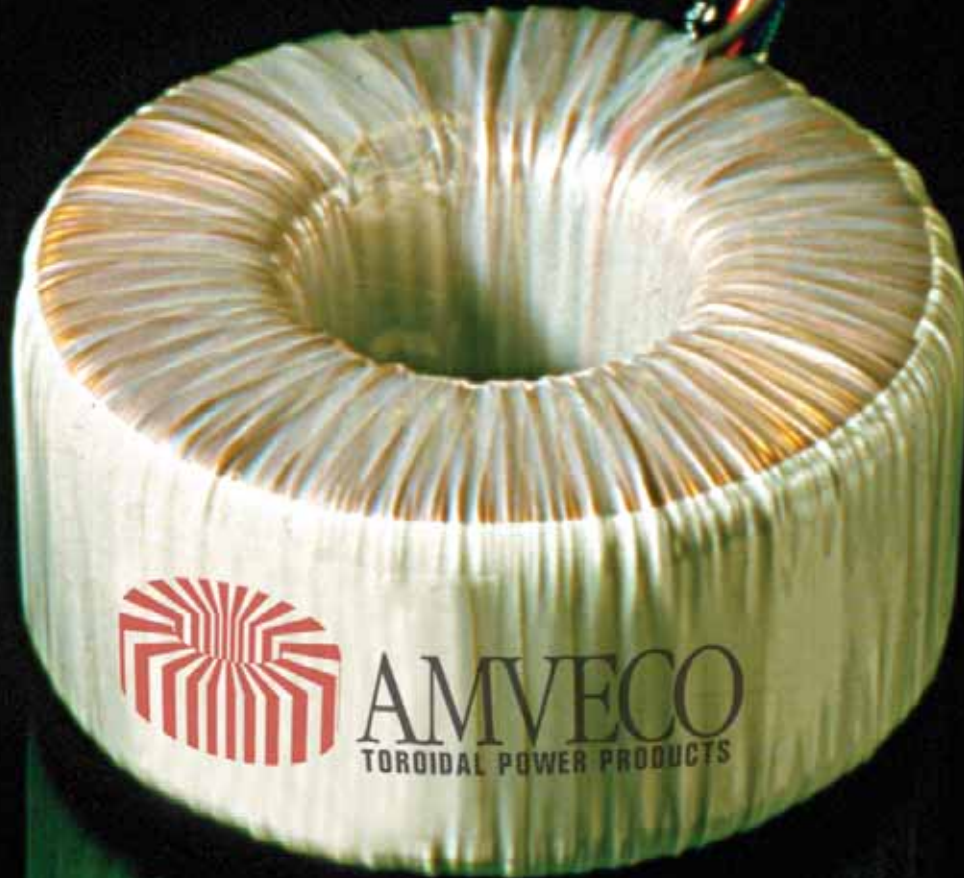
*AMVECO... Making a World of Difference in Toroidal Transformers.*



**AMVECO**  
TOROIDAL POWER PRODUCTS



AMVECO  
TOROIDAL POWER PRODUCTS



*On this page you can learn about the benefits of using AMVECO toroidal transformers. Of special importance are the following points:*

- AMVECO is an ISO 9001 registered company
- AMVECO's transformers use only flame-retardant material (UL 94-V2)
- AMVECO offers lifetime warranty for its products
- AMVECO's transformers are recognized to several UL standards and certified by CSA as well as TUV for medical applications.

## ***High Performance Products For Your High Performance Applications.***



### **SMALL SIZE**

Most toroids are smaller than their E-I transformer counterparts. Electrical and mechanical designers appreciate a toroid's compact dimensions. They are particularly well suited where low height is a consideration.



### **LOW STRAY MAGNETIC FIELD**

Toroids have no airgaps: primaries and secondaries are wound uniformly around the entire core. As a result, toroids emit very low radiated magnetic fields. This makes the toroid ideal for applications involving high sensitivity circuitry.



### **LOW MECHANICAL HUM**

The core of a toroid is formed from a single strip of grain-oriented electrical grade silicon steel tightly wound in the form of a clock spring with the ends spot-welded in place. The copper wire is wound over polyester film, forming a silent, stable unit without the use of environmentally unfriendly glues or varnishes.



### **FLEXIBLE DIMENSIONS**

Compounding the benefits of low weight and small size is the flexibility to vary dimensions. Because AMVECO is not tied down to core caps or lamination sizes, the height and diameter of our toroids may be economically varied to accommodate equipment design requirements.



### **LOW WEIGHT**

Because they are more efficient, toroids can be up to 50% lighter, (depending on power rating), than conventional laminated transformers. Low weight simplifies end product design by reducing mounting hardware and supporting enclosure requirements.



### **LOW NO-LOAD LOSSES**

Compared to conventional E-I transformers, toroids exhibit extremely low no-load losses. In applications where a circuit is in a "stand-by" mode for long periods, the potential cost reduction for power can be significant, sometimes 80-90%.



### **HIGH EFFICIENCY**

Due to its unique construction, toroids are typically between 15 and 30% more efficient than the conventional type. As a rule; the larger the transformer, the more efficient it becomes.



### **LOW OPERATING TEMPERATURE**

Since most of the losses in a toroid are in the copperwire, the toroid cools off quicker than the conventional E-I type with more iron. At half the load, the toroid's temperature rise is only about 30% of what it is at full load.

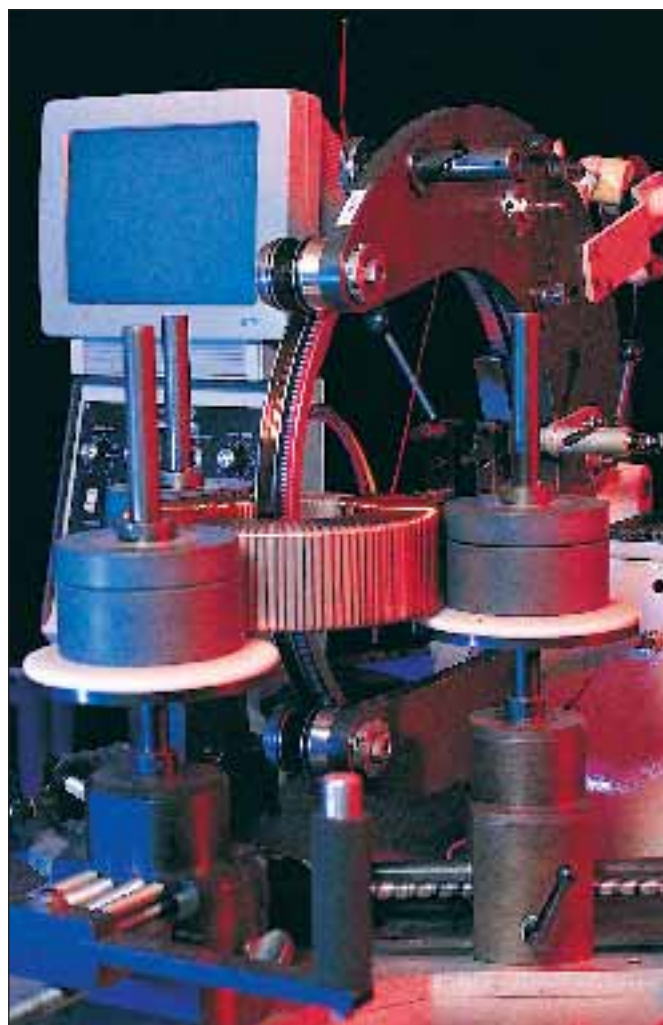


### **EASY TO MOUNT**

A single-center screw easily and quickly mounts the toroid, avoiding costly mechanical design and practical problems associated with conventional E-I-laminated transformers... and three screws are eliminated at assembly!



Winding Area



Copper windings are uniformly wound over entire core, providing better coupling and minimum flux leakage

|                                                                  |    |
|------------------------------------------------------------------|----|
| Features, Advantages and Benefits of Toroidal Power Transformers | 1  |
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### THE SUPERIOR/COST-EFFECTIVE TOROID

AMVECO's state-of-the-art manufacturing processes have made the use of toroids cost-effective across a broad spectrum of applications.

Toroids are routinely replacing laminated frame types in the most demanding industry applications, including: medical, telecommunications, instrumentation, test equipment, lighting and signs, process control, office and computer peripherals, audio and broadcast, as well as many others.

### HIGHER LEVEL ASSEMBLY

AMVECO's higher level assembly services deliver products one step closer to production. This approach can save you time and money while AMVECO's in-house tooling and testing capabilities ensure prompt delivery of high quality products ready for your final assembly.

### COMPLIMENTARY PRODUCTS

AMVECO also designs and produces standard and custom inductors, current transformers and auto transformers. All custom components are designed and manufactured to meet customer specifications and are also subjected to the same demanding manufacturing standards used in the production of our toroidal transformers. These complimentary products have been developed, and will continue to be developed, in response to your needs.



*Higher Level Assembly*



*Compliance Testing and Marking*

### WE ARE HERE TO SERVE YOU

Our engineers want to be part of your power supply design group. We'll show you how you can optimize your product's appearance and performance and reduce total cost.

Since most of our products are custom designed, our work begins with a customer inquiry. Together with a customer's engineers, we determine the AC line, AC or DC load requirements and other user-specific conditions. With state-of-the-art proprietary CAD programs, our engineers quickly generate preliminary designs. Often in a matter of hours, if needed.



*Powering Lasers*



*Toroids for Medical Isolation*

Our tested and proven in-house software programs enable us to simulate optimum performance characteristics from your data. All of our design proposals are accompanied by a price quotation. You can then order a prototype for your evaluation, or select from our extensive inventory of standard toroids. You incur no expense until you place an order.

AMVECO can respond quickly and effectively to meet your needs because we have experienced people to assist you at every step, from the factory to the field. Expert application and product engineers can work with you from initial development through final delivery. Our knowledgeable customer service personnel utilize fully computerized processing systems for prompt, reliable service. Our representative organizations are strategically located to meet your needs nationwide.

## SAFETY STANDARDS

AMVECO proudly holds Certificates from both North American and International Safety Standard Testing Laboratories in addition to having its factory certified to ISO 9001.

Family Approvals (recognitions) which eliminate the need to send new designs for destructive testing.

- UL 506 General Purpose Transformers (File # E 122978)
- UL 6500, Audio, Radio and Television Products (File # E 217481)
- UL 1950 Information Technology Equipment, Electrical Business Equipment (File # E 138299)
- UL 544/UL 2601 Medical and Dental Equipment (File # E 138299)
- UL 1446, Class B, Class F and Class H Insulation Systems (File # E 123069)
- CSA 22.2 No. 66-1988 Specialty Transformers (File # LR 86989)
- CSA 22.2 No. 601.1 M90 Medical Standard for Canada (File # E 138299)
- IEC 601.1 (Medical Standard for International Installations)
- EN 60601 Medical Standard for European Installations
- EN 60742/EN 61558 European Safety Standard for General Purpose Transformers

AMVECO maintains an active policy to invest in family approvals of different domestic and international safety standards in direct response to market needs and to better serve its customer base.

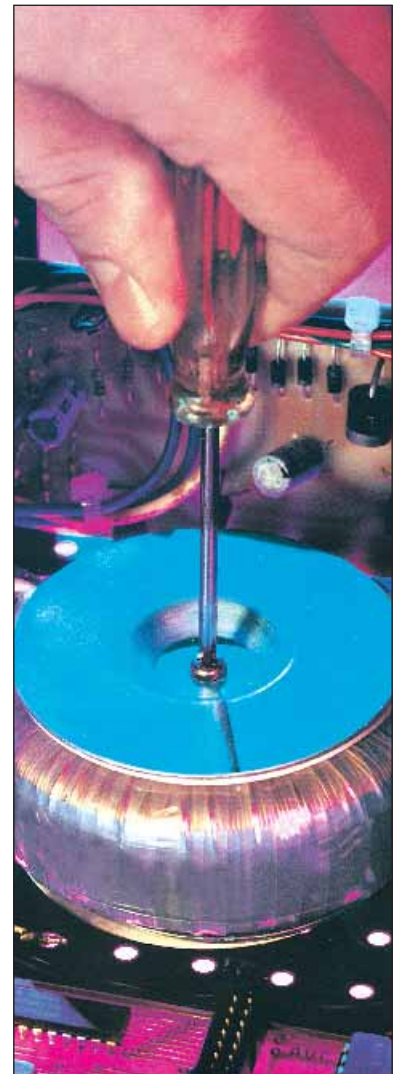
## EXPERT CERTIFICATION GUIDANCE

AMVECO can also provide test data and construction documentation required by regulatory agencies. The major agencies throughout the world have already tested our standard lines and certification for most toroid applications is on hand, including UL, CSA, TUV and CE marking is an available option.

## ISO 9001 CERTIFIED QUALITY SYSTEM

With ISO 9001 Certification as a cornerstone, since 1992, AMVECO's quality policy represents a never-ending process that involves the commitment of every employee. This commitment is proven every day, at every step in the manufacturing process through delivery of our products to you.

*Convenient One-Bolt Mounting*



*Harnessing with Connectors*



*Toroids are Used for Lighting and Signs*



## UNMATCHED QUALITY/UNPARALLELED SERVICE

Power system design engineers have come to recognize AMVECO as the leading manufacturer of custom toroidal power transformers and inductors.

Over the years since 1982, we have built a reputation for excellence by focusing on design engineering state-of-the-art production capabilities and customer support services. Our quality management system has been ISO 9001 certified since 1992.

When you select AMVECO for your power transformer needs you acquire a team of experienced professionals that offer assistance from design to delivery and beyond.

One simple fact verifies our quality claims: our customers stay with us year after year and continue to trust us with their new product needs.

**In addition to Class A insulation system, Amveco offers Class B (130 °C), Class E (120 °C), Class F (155 °C) and Class H (180 °C).**

### Electrostatic Shield (Customer Specified)

- Reduces capacitive coupling between primary and secondary windings
- Copper foil (2 mil) laminated between polyester film and tape
- Tightly wound over primary insulation

### Primary to Secondary Insulation

- Polyester film-Class B (130 °C)
- Four layers minimum between windings
- Meets test requirement of 4000V RMS for 1 minute between primary and secondary

### Windings

- Base coat of Polyester. Heavy topcoat of amide imide (200 °C)
- Wound uniformly over entire core
- Better heat dissipation
- Windings configured for minimum flux leakage
- Low voltage maintained between adjacent turns

### Thermal Protection (Customer Specified)

- Usually in primary circuit
- Normally closed-auto reset opens at high temperature
- One-shot fuse also available
- UL, CSA, VDE listed components

### Core Insulation

- All cores: 100% surface coverage of four layers of 2 mil polyester film Class B (130 °C)
- Protects, insulates and cushions the core from windings and reduces vibration

AMVECO's unique method to protect the wire from the sharp corners of the core during the winding operation permits unlimited choice of core size to best meet the customer's available space. Other methods include use of plastic end caps or dipping the core in epoxy. Amveco can offer these methods too, if preferred by the customer.

### Wire Leads

- Choice of two types of leads connected to windings:
  - \*Self leads: The magnet wire is extended through sleeving for connection to circuit. Standard: Class A (105 °C)
  - \*Stranded wire leads: Class A (105 °C) - Class H (180 °C)
- Each lead anchored to toroid body with high tensile strength tape to withstand severe pull test
- Primary leads covered with second layer of sleeving - double insulation... standard on all units
- Color, length, stripping and terminations can be customer specified

### Center Hole Potting (Customer Specified)

- Thermoplastic material
- High mounting precision
- Threaded insert or press fitted stud is optional
- Thermally conductive compound available

### Outer Insulation

- Tape wound type: Standard two layers polyester film Class B (130 °C)
- Magnetic enclosures optional

### Magnetic Shield (Customer Specified)

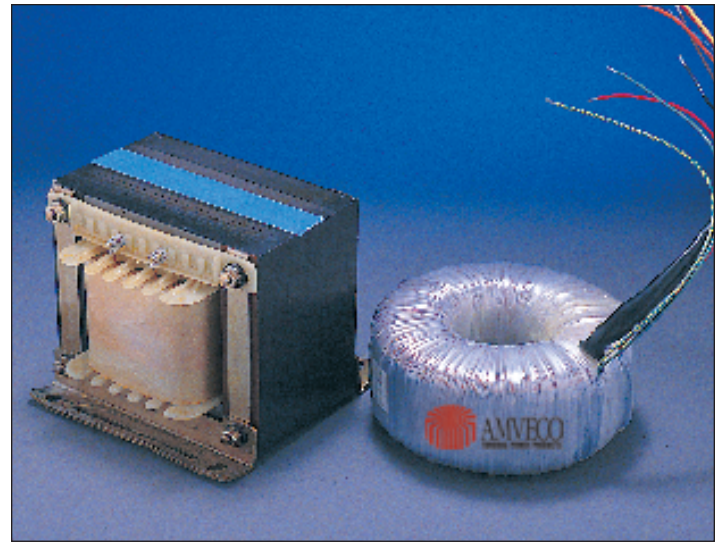
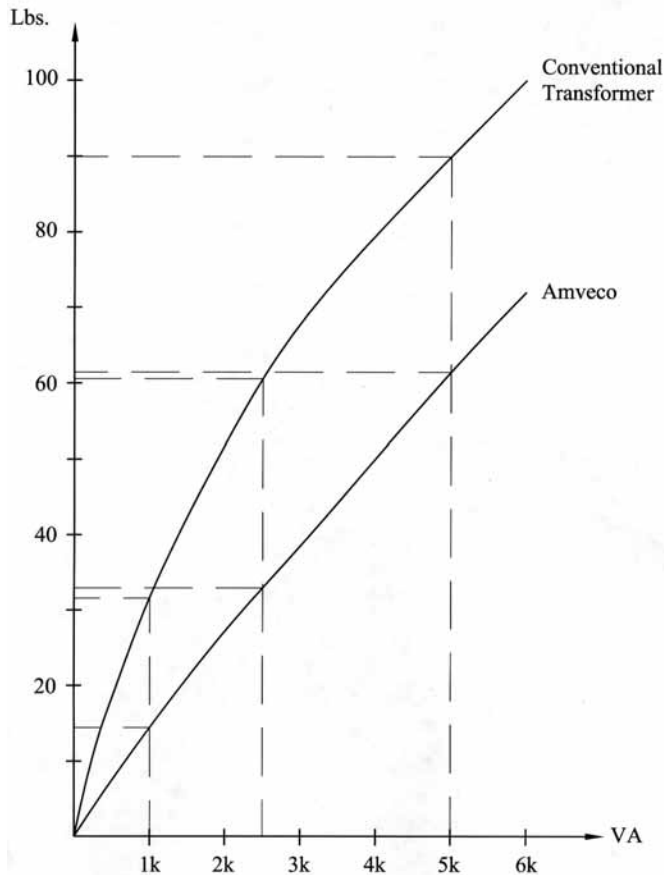
- Multiple layers of grain oriented silicon steel tightly wound around the toroid's circumference
- Fixed in place by outer insulation

### Core

- Cores are manufactured and annealed in-house, under controlled conditions
- Continuous tightly wound grain oriented silicon steel... no airgaps, no mechanical noise
- Lathed radial corners... compact design, most efficient use of materials
- No core caps necessary

# COMPARISON DATA

Weight Comparison: Toroid vs. E-I Transformer



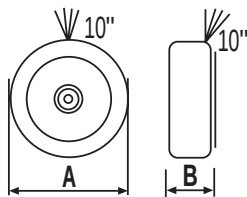
**Overall Comparison of 250 VA E-I Core Isolation Transformer vs. 250 VA E/I-Core AMVECO Isolation Transformer**

| Feature                     | E-I Core Transformer                                       | AMVECO                                                           |
|-----------------------------|------------------------------------------------------------|------------------------------------------------------------------|
| Height                      | 4.7" (119 mm)                                              | 2.2" (56 mm)                                                     |
| Width                       | 3.9" (99 mm)                                               | 4.5" (114 mm)                                                    |
| Depth                       | 4.3" (109 mm)                                              | 4.5" (114 mm)                                                    |
| Volume                      | 78.8 sq. in. (508.4 cm <sup>2</sup> )                      | 35.0 sq. in. (225.8 cm <sup>2</sup> )                            |
| Dimensional Adaptability    | Limited by available dies                                  | All dimensions can be adjusted                                   |
| Weight                      | 10 lb. (4.5 kg)                                            | 5 lb. (2.3 kg)                                                   |
| Mounting Requirements       | Four corner bolts                                          | Single bolt through center                                       |
| No-load Loss                | 10.0 W                                                     | 1.5 W                                                            |
| Continuity of Magnetic Path | 50% of grain perpendicular                                 | 100% parallel grain orientation                                  |
| Air Gaps                    | Approximately 180 (60 laminations x 3)                     | None                                                             |
| Magnetic Properties of Core | Affected by clamping welding, banding, etc.                | Optimized prior to winding and remain stable                     |
| Coupling Factor             | Limited by bobbin width and layers of windings             | Maximized by even winding distribution & close proximity to core |
| Long-term Reliability       | Thermal cycling and vibration steadily degrade performance | Lifetime Warranty                                                |

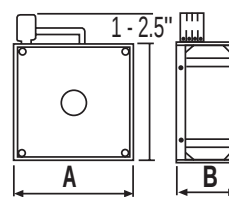


Completing a "King-size" Toroid

## REFERENCE GUIDE FOR PHYSICAL SIZE AND LOSS DATA OF CUSTOM DESIGNED TOROIDAL TRANSFORMERS UP TO 12 KVA



**DISK MOUNTING**



**FLANGE MOUNTING**

|                    |       |                                  |                 | Dimensions  |             |                | Dimensions  |             |                |
|--------------------|-------|----------------------------------|-----------------|-------------|-------------|----------------|-------------|-------------|----------------|
| Nominal Power (VA) |       | Copper Losses <sup>(*)</sup> (W) | Core Losses (W) | A inch (mm) | B inch (mm) | Weight lb (kg) | A inch (mm) | B inch (mm) | Weight lb (kg) |
| 50-60 Hz           | 60Hz  |                                  |                 |             |             |                |             |             |                |
| 15                 | 18    | 3.0                              | 0.20            | 2.5 (64)    | 1.3 (33)    | 0.7 (0.3)      | N/A         | N/A         | N/A            |
| 30                 | 36    | 5.8                              | 0.25            | 3.0 (76)    | 1.5 (38)    | 1.1 (0.5)      |             |             |                |
| 50                 | 60    | 8.6                              | 0.45            | 3.2 (81)    | 1.4 (36)    | 1.6 (0.7)      |             |             |                |
| 80                 | 95    | 12.0                             | 0.60            | 3.9 (99)    | 1.5 (38)    | 2.2 (1.0)      |             |             |                |
| 120                | 145   | 16.0                             | 0.90            | 3.9 (99)    | 1.9 (48)    | 3.0 (1.4)      | N/A         | N/A         | N/A            |
| 160                | 190   | 19.0                             | 1.20            | 4.5 (114)   | 1.7 (43)    | 3.8 (1.7)      |             |             |                |
| 225                | 270   | 20.0                             | 1.40            | 4.5 (114)   | 2.0 (51)    | 4.9 (2.2)      |             |             |                |
| 300                | 360   | 22.0                             | 1.70            | 4.6 (117)   | 2.6 (66)    | 5.7 (2.6)      |             |             |                |
| 400                | 480   | 27.0                             | 2.00            | 5.4 (137)   | 2.0 (51)    | 6.5 (3.0)      | 5.7 (145)   | 3.3 (84)    | 8.1 (3.7)      |
| 500                | 600   | 31.0                             | 2.40            | 5.4 (137)   | 2.4 (61)    | 8.0 (3.6)      | 5.7 (145)   | 3.7 (94)    | 9.6 (4.4)      |
| 625                | 750   | 36.0                             | 3.10            | 5.5 (140)   | 3.2 (81)    | 9.5 (4.3)      | 5.7 (145)   | 4.2 (107)   | 11.1 (5.0)     |
| 800                | 960   | 45.0                             | 3.80            | 6.4 (163)   | 2.7 (69)    | 12.3 (5.6)     | 6.9 (175)   | 3.9 (99)    | 14.6 (6.6)     |
| 990                | 1200  | 45.0                             | 4.70            | 6.4 (163)   | 3.0 (76)    | 16.0 (7.3)     | 6.9 (175)   | 4.3 (109)   | 18.3 (8.3)     |
| 1100               | 1320  | 45.0                             | 6.50            | 6.4 (163)   | 3.3 (84)    | 17.0 (7.7)     | 6.9 (175)   | 4.6 (117)   | 19.3 (8.8)     |
| 1300               | 1560  | 60.0                             | 5.70            | 8.0 (203)   | 2.6 (66)    | 20.0 (9.1)     | 8.3 (211)   | 3.9 (99)    | 23.0 (10.4)    |
| 1600               | 1920  | 62.0                             | 7.10            | 8.0 (203)   | 3.0 (76)    | 23.0 (10.4)    | 8.3 (211)   | 4.3 (109)   | 26.0 (11.8)    |
| 1900               | 2280  | 65.0                             | 8.50            | 8.0 (203)   | 3.4 (86)    | 26.0 (11.8)    | 8.3 (211)   | 4.7 (119)   | 29.0 (13.2)    |
| 2200               | 2640  | 73.0                             | 8.10            | 8.9 (226)   | 3.3 (84)    | 29.0 (13.2)    | 9.3 (236)   | 5.1 (130)   | 33.5 (15.2)    |
| 2500               | 3000  | 79.0                             | 9.70            | 8.9 (226)   | 3.5 (89)    | 33.0 (15.0)    | 9.3 (236)   | 5.3 (135)   | 37.5 (17.0)    |
| 2800               | 3360  | 89.0                             | 11.00           | 9.8 (249)   | 3.1 (79)    | 35.0 (15.9)    | 10.2 (259)  | 4.9 (124)   | 41.0 (18.6)    |
| 3200               | 3840  | 91.0                             | 11.00           | 9.8 (249)   | 3.5 (89)    | 42.0 (19.1)    | 10.2 (259)  | 5.3 (135)   | 48.0 (21.8)    |
| 3700               | 4440  | 93.0                             | 15.00           | 9.8 (249)   | 3.9 (99)    | 46.0 (20.9)    | 10.2 (259)  | 5.7 (145)   | 52.0 (23.6)    |
| 4400               | 5280  | 112.0                            | 17.00           | 11.2 (284)  | 4.3 (109)   | 53.0 (24.0)    | 11.6 (295)  | 6.1 (155)   | 60.0 (27.2)    |
| 5000               | 6000  | 112.0                            | 20.00           | 11.2 (284)  | 4.7 (119)   | 62.0 (28.1)    | 11.6 (295)  | 6.5 (165)   | 69.0 (31.3)    |
| 6300               | 7560  | 130.0                            | 27.00           | 12.4 (315)  | 4.7 (119)   | 76.0 (34.5)    | 13.8 (351)  | 6.5 (165)   | 89.0 (40.4)    |
| 8000               | 9600  | 140.0                            | 28.00           | 13.4 (340)  | 4.7 (119)   | 88.0 (39.9)    | 13.8 (351)  | 6.5 (165)   | 101.0 (45.8)   |
| 10000              | 12000 | 140.0                            | 39.00           | 13.4 (340)  | 5.9 (150)   | 120.0 (54.4)   | 13.8 (351)  | 7.7 (196)   | 133.0 (60.3)   |

*The values given are typical values. (\*) Copper losses at 25 °C ambient temperature and full load.*

Over 95% of our sales are custom designs. Because they require no elaborate production tools and are individually wound, toroidal transformers are particularly well suited to custom designs.

Take advantage of our custom design service at no obligation.

Our interactive computer design capabilities enable us to optimize design's for either AC or DC loads.

- **Quick response to requests for quotations**
- **Rapid delivery of prototypes**
- **Pre-certified by electrical safety agencies: UL and CSA**
- **Variety of mounting arrangements**
- **Lifetime Warranty**

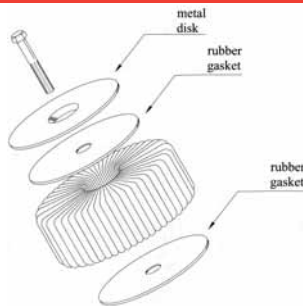
# TOROIDAL MOUNTING METHODS

## DIMENSIONS OF METAL MOUNTING DISK AND INSULATING PAD

| Power Range<br>VA | OD<br>inch (mm) | Hole<br>inch (mm) | Thickness<br>inch (mm) | Recom.<br>Hardware |
|-------------------|-----------------|-------------------|------------------------|--------------------|
| 20                | 1.7 (45)        | 0.18 (4.5)        | 0.04 (1)               | #8                 |
| 40-60             | 2.4 (60)        | 0.20 (5.2)        | 0.04 (1)               | #10                |
| 100-150           | 2.8 (70)        | 0.26 (6.6)        | 0.04 (1)               | 1/4"               |
| 200-350           | 3.5 (90)        | 0.26 (6.6)        | 0.05 (1.3)             | 1/4"               |
| 425-800           | 4.4 (110)       | 0.26 (6.6)        | 0.06 (1.5)             | 1/4"               |
| 800-1200          | 5.2 (130)       | 0.33 (8.4)        | 0.07 (1.7)             | 5/16"              |
| 1200-1500         | 5.6 (145)       | 0.41 (10.3)       | 0.07 (1.7)             | 3/8"               |

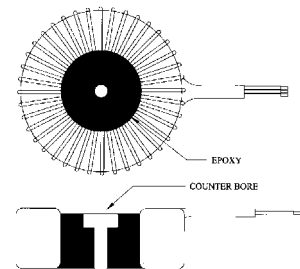
### Metal Disk with Insulating Pads

Up to 1500VA

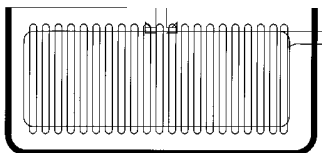
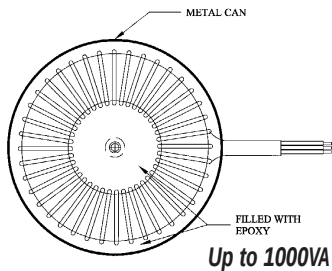


### Potted Centerhole

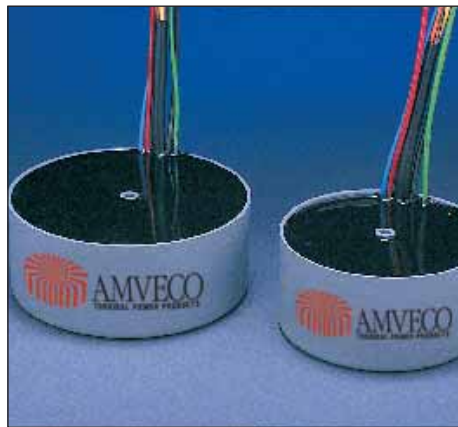
All Sizes



### Potted in a Metal Can

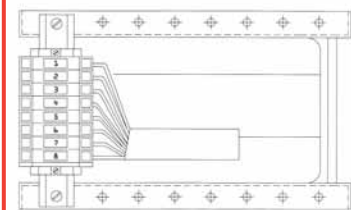


Epoxy Potted Inside Enclosure  
with Threaded Insert

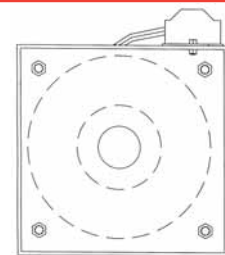


Toroids Potted in Plastic Cans

### Flange Mounts

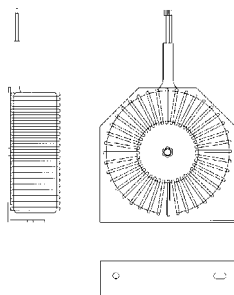


(Top View)



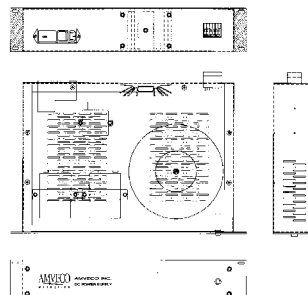
400VA and up

### L-Bracket

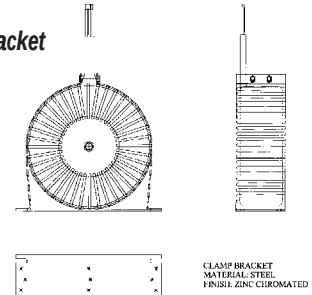


Up to 1000VA

### AMVECO's Custom Designed Enclosure



### Clamping Bracket

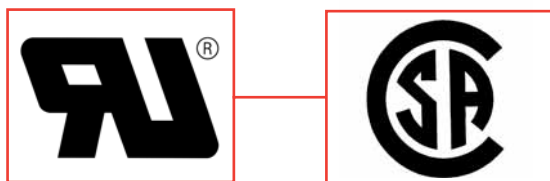


45VA - 4000VA

CLAMP BRACKET  
MATERIAL: STEEL  
FINISH: ZINC CHROMATED

## NORTH AMERICAN 120V/60HZ

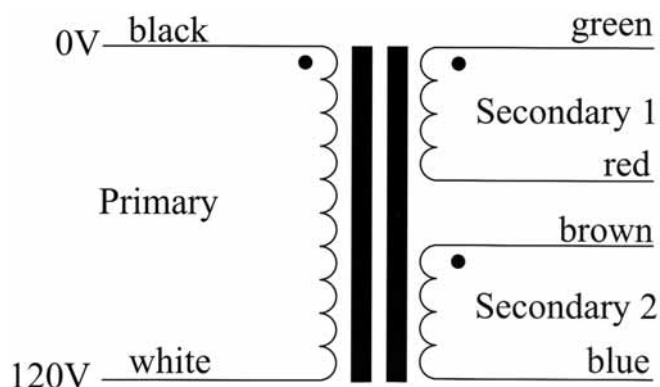
- Lifetime warranty
- 120V, 60Hz
- Many popular secondary voltage options
- 18 to 1000VA ratings available
- Listed as recognized/certified components (UL and CSA)
- Class A (105 °C)
- Disk mounting hardware included
- 10" color coded self leads



## WINDING CONFIGURATIONS WITH COLOR CODES

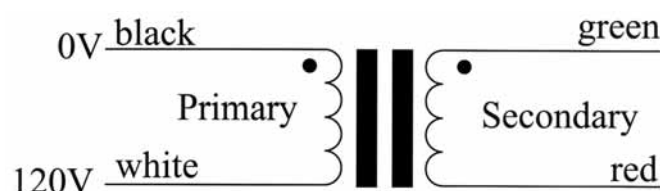
**Figure 1**

Single 120V/60Hz Primary w/ Dual Secondaries



**Figure 2**

Single 120V/60Hz Primary w/ Single Secondary



| Nominal Power VA | Secondary Voltage VAC | Secondary Current AAC | AxB <sup>1</sup> in Weight lb Mounting Hardware* | AxB <sup>1</sup> mm Weight kg | Part No.    |
|------------------|-----------------------|-----------------------|--------------------------------------------------|-------------------------------|-------------|
| 18               | 2x9                   | 1.0                   | 2.5x1.3                                          | 64x33                         | AA5018-2009 |
|                  | 2x12                  | 0.7                   | 0.7                                              | 0.3                           | AA5018-2012 |
|                  | 2x15                  | 0.6                   | #8                                               |                               | AA5018-2015 |
|                  | 2x18                  | 0.5                   |                                                  |                               | AA5018-2018 |
| 36               | 2x9                   | 2.0                   | 2.9x1.5                                          | 74x38                         | AA5036-2009 |
|                  | 2x12                  | 1.5                   | 1.1                                              | 0.5                           | AA5036-2012 |
|                  | 2x15                  | 1.2                   | #10                                              |                               | AA5036-2015 |
|                  | 2x18                  | 1.0                   |                                                  |                               | AA5036-2018 |
| 60               | 2x9                   | 3.3                   | 3.3x1.4                                          | 84x36                         | AA5060-2009 |
|                  | 2x12                  | 2.5                   | 1.6                                              | 0.7                           | AA5060-2012 |
|                  | 2x15                  | 2.0                   | #10                                              |                               | AA5060-2015 |
|                  | 2x18                  | 1.7                   |                                                  |                               | AA5060-2018 |
| 90               | 2x12                  | 3.8                   | 3.7x1.5                                          | 94x38                         | AA5090-2012 |
|                  | 2x15                  | 3.0                   | 1.9                                              | 0.9                           | AA5090-2015 |
|                  | 2x18                  | 2.5                   | #10                                              |                               | AA5090-2018 |
|                  | 2x22                  | 2.0                   |                                                  |                               | AA5090-2022 |
| 115              | 2x12                  | 4.8                   | 3.9x1.5                                          | 99x38                         | AA5115-2012 |
|                  | 2x15                  | 3.8                   | 2.2                                              | 1.0                           | AA5115-2015 |
|                  | 2x18                  | 3.2                   | 1/4"                                             |                               | AA5115-2018 |
|                  | 2x22                  | 2.6                   |                                                  |                               | AA5115-2022 |
| 170              | 2x12                  | 7.1                   | 3.9x1.9                                          | 99x48                         | AA5170-2012 |
|                  | 2x15                  | 5.7                   | 3.1                                              | 1.4                           | AA5170-2015 |
|                  | 2x18                  | 4.7                   | 1/4"                                             |                               | AA5170-2018 |
|                  | 2x22                  | 3.9                   |                                                  |                               | AA5170-2022 |
| 220              | 220                   | 1.0                   | 4.5x1.8                                          | 114x46                        | AA5220-1220 |
|                  | 2x18                  | 6.1                   | 4.0                                              | 1.8                           | AA5220-2018 |
|                  | 2x22                  | 5.0                   | 1/4"                                             |                               | AA5220-2022 |
|                  | 2x24                  | 4.6                   |                                                  |                               | AA5220-2024 |
| 360              | 220                   | 1.6                   | 4.5x2.4                                          | 114x61                        | AA5360-1220 |
|                  | 2x24                  | 7.5                   | 5.4                                              | 2.5                           | AA5360-2024 |
|                  | 2x30                  | 6.0                   | 1/4"                                             |                               | AA5360-2030 |
|                  | 2x33                  | 5.5                   |                                                  |                               | AA5360-2033 |
| 450              | 2x38                  | 4.7                   |                                                  |                               | AA5360-2038 |
|                  | 220                   | 2.1                   | 5.4x2.0                                          | 137x51                        | AA5450-1220 |
|                  | 2x30                  | 7.5                   | 6.5                                              | 3.0                           | AA5450-2030 |
|                  | 2x33                  | 6.8                   | 1/4"                                             |                               | AA5450-2033 |
| 550              | 2x38                  | 5.9                   |                                                  |                               | AA5450-2038 |
|                  | 220                   | 2.5                   | 5.4x2.6                                          | 137x66                        | AA5550-1220 |
|                  | 2x30                  | 9.2                   | 8.5                                              | 3.7                           | AA5550-2030 |
|                  | 2x33                  | 8.3                   | 1/4"                                             |                               | AA5550-2033 |
| 650              | 2x38                  | 7.2                   |                                                  |                               | AA5550-2038 |
|                  | 120                   | 5.4                   | 5.4x2.8                                          | 137x71                        | AA5650-1120 |
|                  | 2x24                  | 13.5                  | 9.5                                              | 4.3                           | AA5650-2024 |
|                  | 2x30                  | 10.8                  | 5/16"                                            |                               | AA5650-2030 |
| 790              | 2x42                  | 7.7                   |                                                  |                               | AA5650-2042 |
|                  | 120                   | 6.6                   | 5.8x2.8                                          | 147x71                        | AA5790-1120 |
|                  | 2x24                  | 16.5                  | 11.5                                             | 5.2                           | AA5790-2024 |
|                  | 2x30                  | 13.2                  | 5/16"                                            |                               | AA5790-2030 |
| 1000             | 2x42                  | 9.4                   |                                                  |                               | AA5790-2042 |
|                  | 120                   | 8.3                   | 6.5x2.6                                          | 165x66                        | AA5000-1120 |
|                  | 2x24                  | 20.8                  | 12.4                                             | 5.6                           | AA5000-2024 |
|                  | 2x30                  | 16.7                  | 5/16"                                            |                               | AA5000-2030 |
|                  | 2x42                  | 11.9                  |                                                  |                               | AA5000-2042 |

The values given are typical values

\*Recommended sizes

<sup>1</sup>See picture on page 8 (Disk Mounting)

For information about core and copper losses, see page 7

Technical data subject to change without prior notice

# STANDARD DESIGN TOROIDAL TRANSFORMERS



## INTERNATIONAL PRIMARIES 2X117V, 50/60HZ

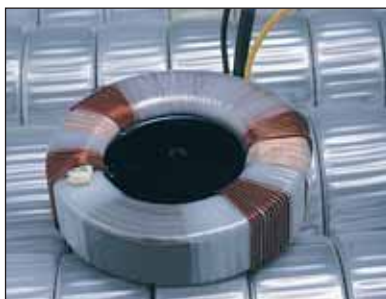
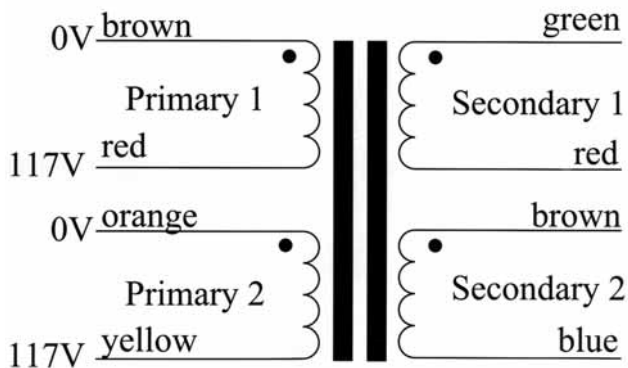
- Lifetime warranty
- 2x117V, 50/60Hz primaries
- Many popular secondary voltage options
- 15 to 990VA ratings available
- Listed as recognized/certified components (UL and CSA)
- Class A (105 °C)
- Disk mounting hardware included
- 10" color coded self leads



## WINDING CONFIGURATIONS WITH COLOR CODES

Dual 117V 50/60Hz Primaries w/ Dual Secondaries

Multiple primaries must be connected in series or parallel.



Layered Construction View

The values given are typical values

\*Recommended sizes

<sup>†</sup>See picture on page 8 (Disk Mounting)

For information about core and copper losses, see page 7

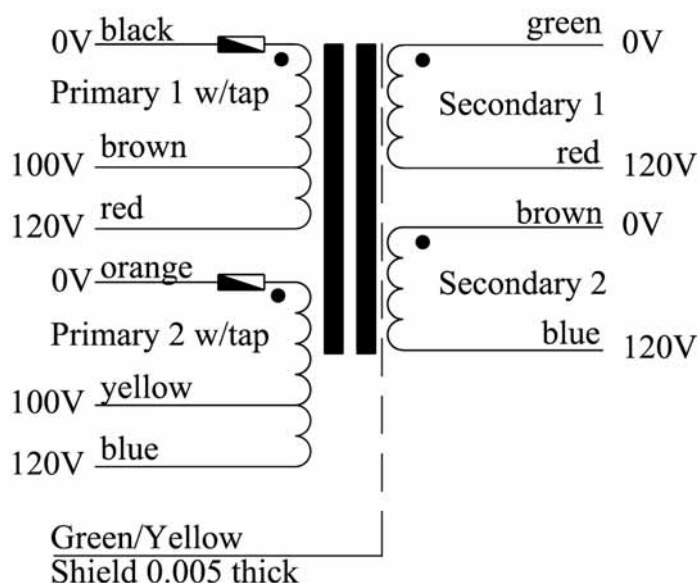
Technical data subject to change without prior notice

| Nominal Power VA | Secondary Voltage VAC | Secondary Current AAC | AxB <sup>†</sup> in Weight lb Mounting Hardware* | AxB <sup>†</sup> mm Weight kg | Part No.    |
|------------------|-----------------------|-----------------------|--------------------------------------------------|-------------------------------|-------------|
| 15               | 2x6                   | 1.25                  | 2.5x1.3<br>0.7<br>#8                             | 64x33<br>0.3                  | AA50152-006 |
|                  | 2x9                   | 0.83                  |                                                  |                               | AA50152-009 |
|                  | 2x12                  | 0.62                  |                                                  |                               | AA50152-012 |
|                  | 2x15                  | 0.50                  |                                                  |                               | AA50152-015 |
|                  | 2x18                  | 0.42                  |                                                  |                               | AA50152-018 |
| 30               | 2x22                  | 0.34                  | 3.0x1.5<br>1.1<br>#10                            | 76x38<br>0.5                  | AA50152-022 |
|                  | 2x6                   | 2.50                  |                                                  |                               | AA50302-006 |
|                  | 2x9                   | 1.67                  |                                                  |                               | AA50302-009 |
|                  | 2x12                  | 1.25                  |                                                  |                               | AA50302-012 |
|                  | 2x15                  | 1.00                  |                                                  |                               | AA50302-015 |
| 50               | 2x18                  | .88                   | 3.2x1.4<br>1.6<br>#10                            | 81x36<br>0.7                  | AA50302-018 |
|                  | 2x22                  | 0.68                  |                                                  |                               | AA50302-022 |
|                  | 2x6                   | 4.2                   |                                                  |                               | AA50502-006 |
|                  | 2x9                   | 2.8                   |                                                  |                               | AA50502-009 |
|                  | 2x12                  | 2.1                   |                                                  |                               | AA50502-012 |
| 95               | 2x15                  | 1.7                   | 3.9x1.5<br>2.2<br>1/4"                           | 99x38<br>1.0                  | AA50502-015 |
|                  | 2x18                  | 1.4                   |                                                  |                               | AA50502-018 |
|                  | 2x22                  | 1.1                   |                                                  |                               | AA50502-022 |
|                  | 2x24                  | 1.0                   |                                                  |                               | AA50502-024 |
|                  | 2x28                  | 0.9                   |                                                  |                               | AA50502-028 |
| 140              | 2x30                  | 0.8                   | 4.5x1.9<br>4.0<br>1/4"                           | 114x48<br>1.4                 | AA50952-009 |
|                  | 2x12                  | 5.3                   |                                                  |                               | AA50952-012 |
|                  | 2x15                  | 3.9                   |                                                  |                               | AA50952-015 |
|                  | 2x18                  | 3.2                   |                                                  |                               | AA50952-018 |
|                  | 2x22                  | 2.6                   |                                                  |                               | AA50952-022 |
| 185              | 2x24                  | 2.2                   | 4.5x2.1<br>4.8<br>1/4"                           | 114x53<br>2.2                 | AA50952-024 |
|                  | 2x28                  | 2.0                   |                                                  |                               | AA50952-028 |
|                  | 2x30                  | 1.7                   |                                                  |                               | AA50952-030 |
|                  | 2x38                  | 1.6                   |                                                  |                               | AA50952-038 |
|                  | 2x117                 | 0.6                   |                                                  |                               | AA50952-117 |
| 240              | 2x12                  | 7.7                   | 4.6x2.6<br>5.7<br>1/4"                           | 117x66<br>2.6                 | AA51402-012 |
|                  | 2x15                  | 6.2                   |                                                  |                               | AA51402-015 |
|                  | 2x18                  | 5.1                   |                                                  |                               | AA51402-018 |
|                  | 2x22                  | 4.2                   |                                                  |                               | AA51402-022 |
|                  | 2x24                  | 3.9                   |                                                  |                               | AA51402-024 |
| 300              | 2x28                  | 3.3                   | 5.4x2.0<br>6.7<br>1/4"                           | 137x51<br>3.0                 | AA51402-028 |
|                  | 2x30                  | 3.1                   |                                                  |                               | AA51402-030 |
|                  | 2x38                  | 2.5                   |                                                  |                               | AA51402-038 |
|                  | 2x117                 | 0.6                   |                                                  |                               | AA51402-117 |
|                  | 2x12                  | 7.7                   | 5.5x3.2<br>9.5<br>1/4"                           | 140x81<br>4.3                 | AA51852-012 |
| 375              | 2x15                  | 6.2                   |                                                  |                               | AA51852-015 |
|                  | 2x18                  | 5.1                   |                                                  |                               | AA51852-018 |
|                  | 2x22                  | 4.2                   |                                                  |                               | AA51852-022 |
|                  | 2x24                  | 3.9                   |                                                  |                               | AA51852-024 |
| 460              | 2x28                  | 3.3                   | 6.4x2.7<br>12.3<br>5/16"                         | 163x69<br>5.6                 | AA51852-028 |
|                  | 2x30                  | 3.1                   |                                                  |                               | AA51852-030 |
|                  | 2x38                  | 2.5                   |                                                  |                               | AA51852-038 |
|                  | 2x117                 | 0.6                   |                                                  |                               | AA51852-117 |
|                  | 2x12                  | 10.4                  | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA52402-012 |
| 625              | 2x15                  | 8.0                   |                                                  |                               | AA52402-015 |
|                  | 2x18                  | 6.7                   |                                                  |                               | AA52402-018 |
|                  | 2x22                  | 5.0                   |                                                  |                               | AA52402-022 |
|                  | 2x24                  | 4.0                   |                                                  |                               | AA52402-024 |
| 800              | 2x28                  | 3.2                   | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA52402-028 |
|                  | 2x30                  | 3.0                   |                                                  |                               | AA52402-030 |
|                  | 2x38                  | 2.5                   |                                                  |                               | AA52402-038 |
|                  | 2x117                 | 0.6                   |                                                  |                               | AA52402-117 |
|                  | 2x12                  | 13.0                  | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA53002-012 |
| 990              | 2x15                  | 10.4                  |                                                  |                               | AA53002-015 |
|                  | 2x18                  | 8.3                   |                                                  |                               | AA53002-018 |
|                  | 2x22                  | 6.2                   |                                                  |                               | AA53002-022 |
|                  | 2x24                  | 5.0                   |                                                  |                               | AA53002-024 |
| 990              | 2x28                  | 3.9                   | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA53002-028 |
|                  | 2x30                  | 3.7                   |                                                  |                               | AA53002-030 |
|                  | 2x38                  | 3.0                   |                                                  |                               | AA53002-038 |
|                  | 2x117                 | 0.6                   |                                                  |                               | AA53002-117 |
|                  | 2x12                  | 16.7                  | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA53752-012 |
| 990              | 2x15                  | 13.3                  |                                                  |                               | AA53752-015 |
|                  | 2x18                  | 10.5                  |                                                  |                               | AA53752-018 |
|                  | 2x22                  | 8.2                   |                                                  |                               | AA53752-022 |
|                  | 2x24                  | 7.9                   |                                                  |                               | AA53752-024 |
| 990              | 2x28                  | 6.0                   | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA53752-028 |
|                  | 2x30                  | 5.7                   |                                                  |                               | AA53752-030 |
|                  | 2x38                  | 4.9                   |                                                  |                               | AA53752-038 |
|                  | 2x117                 | 1.6                   |                                                  |                               | AA53752-117 |
|                  | 2x12                  | 9.6                   | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA54602-012 |
| 990              | 2x15                  | 7.7                   |                                                  |                               | AA54602-015 |
|                  | 2x18                  | 6.0                   |                                                  |                               | AA54602-018 |
|                  | 2x22                  | 5.0                   |                                                  |                               | AA54602-022 |
|                  | 2x24                  | 4.0                   |                                                  |                               | AA54602-024 |
| 990              | 2x28                  | 3.2                   | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA54602-028 |
|                  | 2x30                  | 3.0                   |                                                  |                               | AA54602-030 |
|                  | 2x38                  | 2.5                   |                                                  |                               | AA54602-038 |
|                  | 2x117                 | 0.6                   |                                                  |                               | AA54602-117 |
|                  | 2x12                  | 13.0                  | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA56252-012 |
| 990              | 2x15                  | 10.4                  |                                                  |                               | AA56252-015 |
|                  | 2x18                  | 8.3                   |                                                  |                               | AA56252-018 |
|                  | 2x22                  | 6.2                   |                                                  |                               | AA56252-022 |
|                  | 2x24                  | 5.0                   |                                                  |                               | AA56252-024 |
| 990              | 2x28                  | 3.9                   | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA56252-028 |
|                  | 2x30                  | 3.7                   |                                                  |                               | AA56252-030 |
|                  | 2x38                  | 3.0                   |                                                  |                               | AA56252-038 |
|                  | 2x117                 | 0.6                   |                                                  |                               | AA56252-117 |
|                  | 2x12                  | 16.7                  | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA58002-012 |
| 990              | 2x15                  | 13.3                  |                                                  |                               | AA58002-015 |
|                  | 2x18                  | 10.5                  |                                                  |                               | AA58002-018 |
|                  | 2x22                  | 8.2                   |                                                  |                               | AA58002-022 |
|                  | 2x24                  | 7.9                   |                                                  |                               | AA58002-024 |
| 990              | 2x28                  | 6.0                   | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA58002-028 |
|                  | 2x30                  | 5.7                   |                                                  |                               | AA58002-030 |
|                  | 2x38                  | 4.9                   |                                                  |                               | AA58002-038 |
|                  | 2x117                 | 1.6                   |                                                  |                               | AA58002-117 |
|                  | 2x12                  | 9.6                   | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA59902-012 |
| 990              | 2x15                  | 7.7                   |                                                  |                               | AA59902-015 |
|                  | 2x18                  | 6.0                   |                                                  |                               | AA59902-018 |
|                  | 2x22                  | 5.0                   |                                                  |                               | AA59902-022 |
|                  | 2x24                  | 4.0                   |                                                  |                               | AA59902-024 |
| 990              | 2x28                  | 3.2                   | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA59902-028 |
|                  | 2x30                  | 3.0                   |                                                  |                               | AA59902-030 |
|                  | 2x38                  | 2.5                   |                                                  |                               | AA59902-038 |
|                  | 2x117                 | 0.6                   |                                                  |                               | AA59902-117 |
|                  | 2x12                  | 16.7                  | 6.5x3.0<br>15.2<br>5/16"                         | 165x76<br>6.9                 | AA59902-012 |

## PRIMARIES FOR 100V, 120V, 220V, 240V - 50/60HZ

Medical Power & Isolation Transformers 50/60Hz

Multiple primaries must be connected in series or parallel.



NOTE: (suffix) SS = (Single Secondary) Secondary 1 only  
(suffix) DS = (Dual Secondary) Secondary 1 & 2

- Units rated below 1000VA come with metal disk and insulating pads.
- Units rated 1000VA and larger are center potted.
- Units over 3000VA do not have thermal fuses wound in the primaries, but intended to operate external safety device.



Our part numbers - MT100 through MT5000 carry full TUV BAUARTMARK

## (UL 544, UL 2601, IEC 601, CSA 22.2 NO. 601.1) RECOGNIZED MEDICAL POWER/ISOLATION TRANSFORMERS

| Nominal Power VA | Secondary Current at 120 V | Secondary Current at 240 V | AxB' in Weight lb | AxB' mm Weight kg | Part No.  |
|------------------|----------------------------|----------------------------|-------------------|-------------------|-----------|
| 100              | .83A                       |                            | 4.0x2.0<br>2.7    | 102x51<br>1.2     | MT0100SS  |
| 100              | .83A                       | .42A                       | 4.0x2.0<br>2.7    | 102x51<br>1.2     | MT0100DS  |
| 230              | 1.92A                      |                            | 4.6x2.4<br>5.2    | 117x61<br>2.4     | MT0230SS  |
| 230              | 1.92A                      | .96A                       | 4.6x2.4<br>5.2    | 117x61<br>2.4     | MT0230DS  |
| 400              | 3.33A                      |                            | 5.5x2.5<br>8.0    | 140x64<br>3.6     | MT0400SS  |
| 400              | 3.33A                      | 1.67A                      | 5.5x2.5<br>8.0    | 140x64<br>3.6     | MT0400DS  |
| 600              | 5.00A                      |                            | 6.2x3.1<br>13.0   | 157x79<br>5.9     | MT0600SS  |
| 600              | 5.00A                      | 2.5A                       | 6.2x3.1<br>13.0   | 157x79<br>5.9     | MT0600DS  |
| 750              | 6.25A                      |                            | 6.6x3.0<br>14.0   | 168x79<br>6.4     | MT0750SS  |
| 750              | 6.25A                      | 3.12A                      | 6.6x3.1<br>14.0   | 168x76<br>6.4     | MT0750DS  |
| 1000             | 8.33A                      | 4.16A                      | 6.9x3.5<br>20.0   | 175x89<br>9.1     | MT1000DS  |
| 1500             | 12.5A                      | 6.25A                      | 8.2x4.0<br>28     | 208x102<br>12.7   | MT1500DS  |
| 2000             | 16.6A                      | 8.33A                      | 9.1x4.4<br>35     | 231x112<br>15.9   | MT2000DS  |
| 2500             | 20.8A                      | 10.4A                      | 9.4x4.5<br>39     | 239x114<br>17.7   | MT2500DS  |
| 3000             | 25.0A                      | 12.5A                      | 10.0x4.3<br>47    | 254x109<br>21.3   | MT3000DS  |
| 3750             | 31.2A                      | 15.6A                      | 10.5x4.9<br>65    | 267x124<br>29.5   | MT3750DS  |
| 5000             | 41.6A                      | 20.8A                      | 11.6x5.4<br>78    | 295x137<br>35.4   | MT5000DS  |
| 6250             | 52.0A                      | 26.0A                      | 12.0x5.6<br>90    | 305x143<br>40.8   | MT6250DS  |
| 7500             | 62.5A                      | 31.2A                      | 12.0x5.5<br>100   | 305x140<br>45.4   | MT7500DS  |
| 8750             | 72.9A                      | 36.4A                      | 12.5x5.5<br>110   | 318x140<br>49.9   | MT8750DS  |
| 10000            | 83.3A                      | 41.6A                      | 13.0x5.2<br>120   | 330x132<br>54.4   | MT10000DS |

The values given are typical values

Technical data subject to change without prior notice

For mounting information, see diagrams on page 8.

## AUTOTRANSFORMERS YIELD REDUCED SIZE AND COSTS

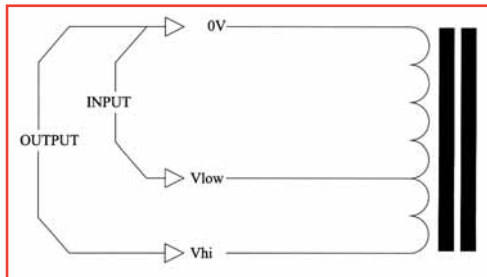
Frequently, in applications calling for simple voltage step-up or step-down, and where there is no requirement for electrical isolation, applying an autotransformer will result in significant size and weight reductions as well as cost. The power rating of an autotransformer is given by the expression:

$$P_{rated} = P_{out} \times (V_{hi} - V_{low}) / V_{hi}$$

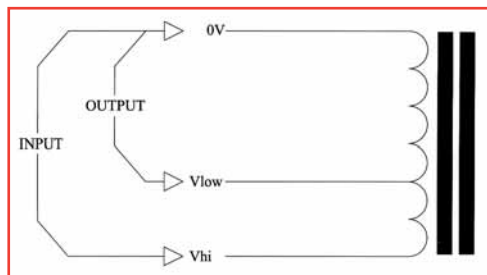
$V_{low}$  = voltage from lower voltage tap (input or output)

$V_{hi}$  = voltage across higher voltage tap (output or input)

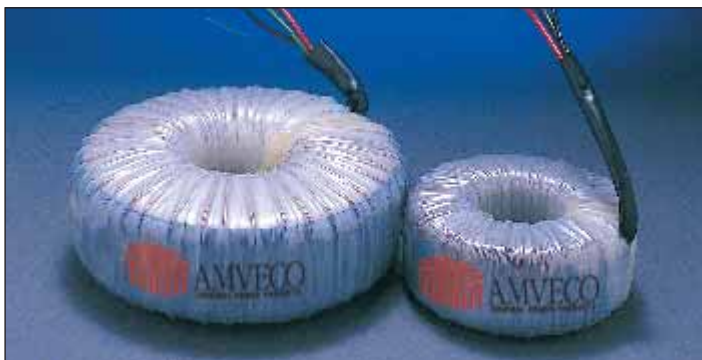
### STEP UP AUTOTRANSFORMER



### STEP DOWN AUTOTRANSFORMER



A rule of thumb to apply when considering an autotransformer is that the voltage across the entire winding should be less than or equal to two times (2x) the value of the lowest voltage tap ( $V_{hi} < 2V_{low}$ ).



1500VA Isolation Transformer and 1500VA Autotransformer



3-Phase Toroidal Array Mounted in Flanges with Terminal Blocks

## 3-PHASE TRANSFORMERS

3-Phase toroidal transformers are simply three separate single phase units. When convenient, they may be mounted as individual units, adding flexibility to the design of the housing or, in many cases, stacked together side by side or stacked on top of each other. For higher powered units, the relative assembly labor is less using toroids where each phase may be handled separately (usually by one person). Compare this to E-I transformer installations where a large single unit must be moved (requiring several workers and a hoist).



*AMVECO quality is ensured through superior design and state-of-the-art production facilities.*



*AMVECO toroids are uniquely lathed at the edges of end core to reduce size and increase performance.*



*Each AMVECO toroidal transformer is subjected to several tests, including 4kVAC minimum hi-pot testing between primary and secondary windings.*



*Amveco offers a broad line of current transformers*

# LOW PROFILE PC MOUNT TRANSFORMERS



| Power VA | Part Number | Sec-Full Load V | Current mA | No Load Voltage | I No-Load | Reg. % | Δt °C | Eff % | Dim. LxWxH mm | Pin Layout XY mm | Pin Size mm |
|----------|-------------|-----------------|------------|-----------------|-----------|--------|-------|-------|---------------|------------------|-------------|
| 1.6      | 70000       | 2x7             | 114        | 2x8.9           | 1.0 (mA)  | 29     | 10    | 77    | 39.6          | 35.56            | 1.0x0.5     |
|          | 70001       | 2x9             | 89         | 2x11.6          |           |        |       |       | x             |                  |             |
|          | 70002       | 2x12            | 67         | 2x15.4          |           |        |       |       | 39.6          |                  |             |
|          | 70003       | 2x15            | 53         | 2x19.3          |           |        |       |       | x             |                  |             |
|          | 70004       | 2x18            | 44         | 2x23.4          |           |        |       |       | 18.5          |                  |             |
| 3.2      | 70010       | 2x7             | 229        | 2x10.2          | 1.5 (mA)  | 43     | 20    | 70    | 82 grams      | 40.64            | 1.0x0.5     |
|          | 70011       | 2x9             | 178        | 2x13.0          |           |        |       |       | 44.7          |                  |             |
|          | 70012       | 2x12            | 133        | 2x17.3          |           |        |       |       | x             |                  |             |
|          | 70013       | 2x15            | 107        | 2x21.4          |           |        |       |       | 44.7          |                  |             |
|          | 70014       | 2x18            | 89         | 2x25.7          |           |        |       |       | x             |                  |             |
| 5.0      | 70020       | 2x7             | 357        | 2x9.7           | 2.0 (mA)  | 40     | 29    | 68    | 110 grams     | 45.72            | 1.0x0.5     |
|          | 70021       | 2x9             | 278        | 2x12.4          |           |        |       |       | 49.7          |                  |             |
|          | 70022       | 2x12            | 208        | 2x17.0          |           |        |       |       | x             |                  |             |
|          | 70023       | 2x15            | 167        | 2x21.3          |           |        |       |       | 49.7          |                  |             |
|          | 70024       | 2x18            | 139        | 2x25.5          |           |        |       |       | x             |                  |             |
| 7.0      | 70030       | 2x7             | 500        | 2x9.5           | 3.0 (mA)  | 34     | 25    | 74    | 144 grams     | 45.72            | 1.0x0.5     |
|          | 70031       | 2x9             | 389        | 2x12.2          |           |        |       |       | 49.7          |                  |             |
|          | 70032       | 2x12            | 292        | 2x16.2          |           |        |       |       | x             |                  |             |
|          | 70033       | 2x15            | 233        | 2x20.3          |           |        |       |       | 49.7          |                  |             |
|          | 70034       | 2x18            | 194        | 2x24.3          |           |        |       |       | x             |                  |             |
| 10.0     | 70040       | 2x7             | 714        | 2x8.3           | 3.0 (mA)  | 20     | 24    | 82    | 174 grams     | 45.72            | 1.0x0.5     |
|          | 70041       | 2x9             | 556        | 12x10.8         |           |        |       |       | 23.1          |                  |             |
|          | 70042       | 2x12            | 417        | 2x14.4          |           |        |       |       | 49.7          |                  |             |
|          | 70043       | 2x15            | 333        | 2x18.0          |           |        |       |       | x             |                  |             |
|          | 70044       | 2x18            | 278        | 2x21.7          |           |        |       |       | 26.0          |                  |             |
| 15.0     | 70050       | 2x7             | 1071       | 2x8.9           | 4.0 (mA)  | 23     | 27    | 80    | 252 grams     | 50.80            | 1.0x0.5     |
|          | 70051       | 2x9             | 833        | 2x11.1          |           |        |       |       | 55.0          |                  |             |
|          | 70052       | 2x12            | 625        | 2x14.8          |           |        |       |       | x             |                  |             |
|          | 70053       | 2x15            | 500        | 2x18.5          |           |        |       |       | 55.0          |                  |             |
|          | 70054       | 2x18            | 417        | 2x22.2          |           |        |       |       | x             |                  |             |
| 25.0     | 70060       | 2x7             | 1785       | 2x8.3           | 5.0 (mA)  | 19     | 28    | 83    | 304 grams     | 55.88            | 1.0x0.5     |
|          | 70061       | 2x9             | 1377       | 2x10.7          |           |        |       |       | 60.0          |                  |             |
|          | 70062       | 2x12            | 1041       | 2x14.3          |           |        |       |       | x             |                  |             |
|          | 70063       | 2x15            | 832        | 2x17.8          |           |        |       |       | 60.0          |                  |             |
|          | 70064       | 2x18            | 694        | 2x21.4          |           |        |       |       | x             |                  |             |
| 35.0     | 70070       | 2x7             | 2500       | 2x8.0           | 7.0 (mA)  | 17.7   | 31    | 81    | 435 grams     | 55.88            | 1.0x0.5     |
|          | 70071       | 2x9             | 1944       | 2x10.6          |           |        |       |       | 60.0          |                  |             |
|          | 70072       | 2x12            | 1458       | 2x14.0          |           |        |       |       | x             |                  |             |
|          | 70073       | 2x15            | 1167       | 2x17.6          |           |        |       |       | 60.0          |                  |             |
|          | 70074       | 2x18            | 972        | 2x20.9          |           |        |       |       | x             |                  |             |
| 50.0     | 70080       | 2x7             | 3571       | 2x8.1           | 8.0 (mA)  | 15.5   | 30    | 86    | 525 grams     | 66.04            | 1.0x1.0     |
|          | 70081       | 2x9             | 2777       | 2x10.4          |           |        |       |       | 72.0          |                  |             |
|          | 70082       | 2x12            | 2083       | 2x13.9          |           |        |       |       | x             |                  |             |
|          | 70083       | 2x15            | 1666       | 2x17.3          |           |        |       |       | 72.0          |                  |             |
|          | 70084       | 2x18            | 1388       | 2x20.8          |           |        |       |       | x             |                  |             |
|          | 70085       | 2x22            | 1136       | 2x25.4          |           |        |       |       | 37.5          | 76.20            | 1.0x1.0     |
|          |             |                 |            |                 |           |        |       |       | 685 grams     |                  |             |

Dimensions in mm. Electrical measurements at 20°C ambient temperature.  
All data subject to change without prior notice.

The attractive 70000-series PC Mount toroidal step-down transformers offer the design engineer the same features as our non-encapsulated toroidal power transformers, namely, very low EMR (magnetic strayfields), quiet operation, low temperature rise, low profile, low no-load current and very low no-load losses.

## STANDARD FEATURES

- Primary voltage of 115V or 230V at 50 / 60Hz
- Safety standard certifications UL 506, UL 1950 (UL File #E145880), EN 60950, EN61558

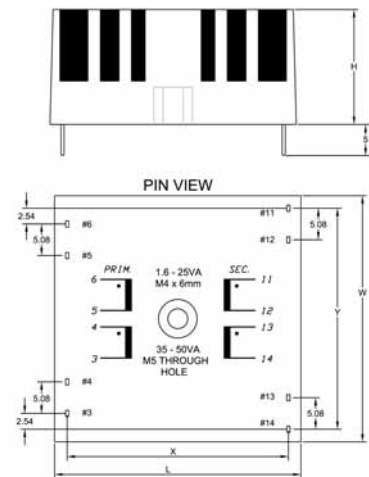
- UL File #122978 recognized for insulation Class A (105 °C)  
Meets all requirements of Class E (125 °C)
- UL and VDE certifications to + 40°C (1.6VA-25VA)
- Hipot testing at 4000V between primary and secondary (VDE0550)
- Maximum ambient temperature of + 60°C for 1.6VA- 25VA, + 40°C for 35VA and 50VA models

## CUSTOM DESIGN OPTIONS

With minimum order of 1000 pieces custom specified primary and secondary voltages are available.

Please contact the Houston factory or your local Amveco sales representative for details.

## WIRE DIAGRAM AND TERMINAL PIN LAYOUT



| Power | L    | W    | H    | X     | Y     | Weight  | Pin     |
|-------|------|------|------|-------|-------|---------|---------|
| 1.6   | 39.6 | 39.6 | 18.5 | 35.56 | 35.56 | 82 gr.  | 1.0x0.5 |
| 3.2   | 44.7 | 44.7 | 19.5 | 40.64 | 40.64 | 110 gr. | 1.0x0.5 |
| 5.0   | 49.7 | 49.7 | 19.5 | 45.72 | 45.72 | 144 gr. | 1.0x0.5 |
| 7.0   | 49.7 | 49.7 | 23.1 | 45.72 | 45.72 | 174 gr. | 1.0x0.5 |
| 10.0  | 55.0 | 55.0 | 26.0 | 50.80 | 50.80 | 252 gr. | 1.0x0.5 |
| 15.0  | 60.0 | 60.0 | 26.3 | 55.88 | 55.88 | 304 gr. | 1.0x0.5 |
| 25.0  | 60.0 | 60.0 | 37.5 | 55.88 | 55.88 | 435 gr. | 1.0x0.5 |
| 35.0  | 72.0 | 72.0 | 37.5 | 66.04 | 66.04 | 525 gr. | 1.0x1.0 |
| 50.0  | 82.4 | 82.4 | 37.5 | 76.20 | 76.20 | 685 gr. | 1.0x1.0 |

Dimensions in mm.

## NOTES

- For 230 volt operation, connect primaries in series by connecting pins 5 & 4 together and apply 230 volts across pins 6 & 3.
- For 115 volt operation, connect primaries in parallel by connecting pins 6 & 4 together and pins 5 & 3 together; apply 115 volts across pins 6 & 5.
- To parallel the secondaries, connect pins 14 to 12 and 13 to 11; take the output across pins 14 and 13.
- To place the secondaries in series, connect pins 13 to 12 and take the output across pins 14 and 11.

| Power VA | Part Number | Sec-Full Load V | Current mA | No Load Voltage | I No-Load | Reg. % | $\Delta t$ °C | Eff % | Dim. ODxDxHT mm    |
|----------|-------------|-----------------|------------|-----------------|-----------|--------|---------------|-------|--------------------|
| 1.6      | 62000       | 2x7             | 114        | 2x8.94          | 1.0 (mA)  | 29     | 10            | 77    | 37.5 x 7.0 x 17.0  |
|          | 62001       | 2x9             | 89         | 2x11.63         |           |        |               |       |                    |
|          | 62002       | 2x12            | 67         | 2x15.43         |           |        |               |       |                    |
|          | 62003       | 2x15            | 53         | 2x19.30         |           |        |               |       |                    |
|          | 62004       | 2x18            | 44         | 2x23.41         |           |        |               |       |                    |
|          | 62005       | 2x22            | 36         | 2x28.19         |           |        |               |       | 71 grams           |
| 3.2      | 62010       | 2x7             | 229        | 2x10.2          | 1.5 (mA)  | 41     | 20            | 70    | 42.0 x 7.0 x 17.5  |
|          | 62011       | 2x9             | 178        | 2x13.0          |           |        |               |       |                    |
|          | 62012       | 2x12            | 133        | 2x17.3          |           |        |               |       |                    |
|          | 62013       | 2x15            | 107        | 2x21.4          |           |        |               |       |                    |
|          | 62014       | 2x18            | 89         | 2x25.7          |           |        |               |       |                    |
|          | 62015       | 2x22            | 73         | 2x31.3          |           |        |               |       | 89 grams           |
| 5.0      | 62020       | 2x7             | 357        | 2x9.7           | 2.0 (mA)  | 45     | 29            | 70    | 47.0 x 6.0 x 18.0  |
|          | 62021       | 2x9             | 278        | 2x12.4          |           |        |               |       |                    |
|          | 62022       | 2x12            | 208        | 2x17.0          |           |        |               |       |                    |
|          | 62023       | 2x15            | 167        | 2x21.3          |           |        |               |       |                    |
|          | 62024       | 2x18            | 139        | 2x25.5          |           |        |               |       |                    |
|          | 62025       | 2x22            | 114        | 2x30.5          |           |        |               |       | 115 grams          |
| 7.0      | 62030       | 2x7             | 500        | 2x9.5           | 3.0 (mA)  | 34     | 25            | 74    | 47.0 x 6.0 x 21.5  |
|          | 62031       | 2x9             | 389        | 2x12.2          |           |        |               |       |                    |
|          | 62032       | 2x12            | 292        | 2x16.2          |           |        |               |       |                    |
|          | 62033       | 2x15            | 233        | 2x20.3          |           |        |               |       |                    |
|          | 62034       | 2x18            | 194        | 2x24.3          |           |        |               |       |                    |
|          | 62035       | 2x22            | 159        | 2x29.7          |           |        |               |       | 145 grams          |
| 10.0     | 62040       | 2x7             | 714        | 2x8.3           | 3.0 (mA)  | 20     | 24            | 82    | 53.5 x 6.8 x 23.5  |
|          | 62041       | 2x9             | 556        | 12x10.8         |           |        |               |       |                    |
|          | 62042       | 2x12            | 417        | 2x14.4          |           |        |               |       |                    |
|          | 62043       | 2x15            | 333        | 2x18.0          |           |        |               |       |                    |
|          | 62044       | 2x18            | 278        | 2x21.7          |           |        |               |       |                    |
|          | 62045       | 2x22            | 227        | 2x26.3          |           |        |               |       | 216 grams          |
| 15.0     | 62050       | 2x7             | 1071       | 2x8.9           | 4.0 (mA)  | 23     | 27            | 81    | 57.5 x 7.0 x 24.0  |
|          | 62051       | 2x9             | 833        | 2x11.1          |           |        |               |       |                    |
|          | 62052       | 2x12            | 625        | 2x14.8          |           |        |               |       |                    |
|          | 62053       | 2x15            | 500        | 2x18.5          |           |        |               |       |                    |
|          | 62054       | 2x18            | 417        | 2x22.2          |           |        |               |       |                    |
|          | 62055       | 2x22            | 341        | 2x27.2          |           |        |               |       | 262 grams          |
| 25.0     | 62060       | 2x7             | 1785       | 2x8.3           | 5.0 (mA)  | 19     | 28            | 84    | 58.0 x 13.8 x 34.5 |
|          | 62061       | 2x9             | 1377       | 2x10.7          |           |        |               |       |                    |
|          | 62062       | 2x12            | 1041       | 2x14.2          |           |        |               |       |                    |
|          | 62063       | 2x15            | 832        | 2x17.8          |           |        |               |       |                    |
|          | 62064       | 2x18            | 694        | 2x21.4          |           |        |               |       |                    |
|          | 62065       | 2x22            | 568        | 2x26.2          |           |        |               |       | 388 grams          |
| 35.0     | 62070       | 2x7             | 2500       | 2x8.4           | 7.0 (mA)  | 17.7   | 31            | 85    | 72.0 x 17.0 x 33.5 |
|          | 62071       | 2x9             | 1944       | 2x10.6          |           |        |               |       |                    |
|          | 62072       | 2x12            | 1458       | 2x14.0          |           |        |               |       |                    |
|          | 62073       | 2x15            | 1166       | 2x17.6          |           |        |               |       |                    |
|          | 62074       | 2x18            | 972        | 2x20.9          |           |        |               |       |                    |
|          | 62075       | 2x22            | 795        | 2x25.7          |           |        |               |       | 453 grams          |
| 50.0     | 62080       | 2x7             | 3571       | 2x8.1           | 8.0 (mA)  | 15.5   | 30            | 86    | 78.0 x 22.5 x 35.0 |
|          | 62081       | 2x9             | 2777       | 2x10.4          |           |        |               |       |                    |
|          | 62082       | 2x12            | 2083       | 2x13.8          |           |        |               |       |                    |
|          | 62083       | 2x15            | 1666       | 2x17.3          |           |        |               |       |                    |
|          | 62084       | 2x18            | 1388       | 2x20.7          |           |        |               |       |                    |
|          | 62085       | 2x22            | 1136       | 2x25.4          |           |        |               |       | 670 grams          |

Dimensions in mm. Electrical measurements at 20°C ambient temperature.  
All data subject to change without prior notice.

The 62000-series Miniature toroidal step-down transformers offers the design engineer the same features as our larger toroidal power transformers, namely, very low EMR (magnetic strayfields), quiet operation, low temperature rise, low profile, low no-load current and very low no-load losses.

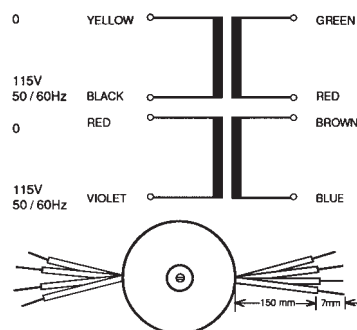
## STANDARD FEATURES

- Primary voltage of 115V or 230V at 50 / 60Hz.
- Safety standard certification (UL 506), design construction meet UL 1950, VDE 0805, IEC 950, EN 60950.
- UL recognized for insulation Class A (105 °C). Meets all requirements of Class E (125 °C)
- UL certifications to + 40 °C (1.6VA-25VA)
- Hipot testing at 4000V between primary and secondary. (VDE0550)
- Maximum ambient temperature of + 60 °C
- Epoxy potted center with through hole for M4 bolt

## CUSTOM DESIGN OPTIONS

With minimum order of 1000 pieces custom specified primary and secondary voltages are available. Please contact the Houston factory or your local Amveco sales representative for details.

## WIRE DIAGRAM AND SCHEMATICS



For 230V/240V operation, connect primaries in series by connecting black and red lead wires together and apply 230V across yellow and violet leads wires.

For 115V/120V operation, connect primaries in parallel by connecting yellow and red lead wires together and black and violet leads wires.

To parallel the secondaries, connect green and brown wires and red and blue together. To connect the secondaries in series, the red and brown wires are connected together. Take the output across the green and blue wires.

# AMVECO STANDARD SERIES INDUCTORS



In addition to toroidal transformers, Amveco designs and manufactures toroidal chokes for DC-filtering and AC-circuits. As with transformers, toroidal chokes also offer significant savings in both size and weight compared to a laminated core. Presently, we manufacture chokes from 0.2 Ws to 25 Ws. AMVECO has developed its own design software which allows us to design and manufacture to your specific needs. With in-house capabilities for both core-making and core-cutting, we can offer fast turn-around for both prototypes and production units.



AMVECO Inductors

| Part Number | Current I DC (A) | Current RMS | L (mH) | Power (WS) | Losses Core-Copper | OD x HT (Inches) | OD x HT (mm) | WT (lbs.) | WT (kg) |
|-------------|------------------|-------------|--------|------------|--------------------|------------------|--------------|-----------|---------|
| L0540       | 5                | 3.5         | 40     | 0.5        | 1.5 - 12.8         | 3.8 x 1.9        | 97 x 48      | 2.5       | 1.1     |
| L0560       | 5                | 3.5         | 60     | 0.75       | 3 - 13.8           | 4.6 x 2.0        | 117 x 51     | 4         | 1.8     |
| L1020       | 10               | 7           | 20     | 1          | 4 - 16.7           | 5.5 x 2.0        | 140 x 51     | 6         | 2.7     |
| L1040       | 10               | 7           | 40     | 2          | 5 - 23.4           | 5.5 x 2.4        | 140 x 61     | 8         | 3.6     |
| L1060       | 10               | 7           | 60     | 3          | 7 - 28.6           | 5.9 x 2.8        | 150 x 71     | 11.5      | 5.2     |
| L1510       | 15               | 10.6        | 10     | 1.13       | 4 - 18.7           | 5.5 x 2.0        | 140 x 51     | 6         | 2.7     |
| L1515       | 15               | 10.6        | 15     | 1.69       | 5 - 22.7           | 5.5 x 2.4        | 140 x 61     | 7.5       | 3.4     |
| L1520       | 15               | 10.6        | 20     | 2.25       | 5 - 26.3           | 5.5 x 2.4        | 140 x 61     | 8         | 3.6     |
| L1540       | 15               | 10.6        | 40     | 4.5        | 8 - 37.8           | 6.5 x 2.8        | 165 x 71     | 15        | 6.8     |
| L2010       | 20               | 14.1        | 10     | 2          | 5 - 23.2           | 5.5 x 2.4        | 140 x 61     | 8         | 3.6     |
| L2015       | 20               | 14.1        | 15     | 3          | 7 - 28.4           | 5.9 x 2.8        | 150 x 71     | 11.5      | 5.2     |
| L2020       | 20               | 14.1        | 20     | 4          | 8 - 32.8           | 6.5 x 2.8        | 165 x 71     | 14        | 6.4     |
| L2040       | 20               | 14.1        | 40     | 8          | 12 - 42.8          | 8.0 x 3.5        | 203 x 89     | 27        | 12.3    |
| L3005       | 30               | 21.2        | 5      | 2.25       | 5 - 26.1           | 5.5 x 2.4        | 140 x 61     | 8.5       | 3.9     |
| L3010       | 30               | 21.2        | 10     | 4.5        | 8 - 37.8           | 6.5 x 2.8        | 165 x 71     | 15        | 6.8     |
| L3015       | 30               | 21.2        | 15     | 6.75       | 11 - 45.9          | 8.0 x 3.0        | 203 x 76     | 22        | 10.0    |
| L3020       | 30               | 21.2        | 20     | 9          | 13 - 43.2          | 8.0 x 3.5        | 203 x 89     | 28        | 12.7    |
| L4005       | 40               | 28.3        | 5      | 4          | 8 - 32             | 6.5 x 2.8        | 165 x 71     | 14        | 6.4     |
| L4010       | 40               | 28.3        | 10     | 8          | 13 - 43.2          | 8.0 x 3.5        | 203 x 89     | 27        | 12.3    |
| L4015       | 40               | 28.3        | 15     | 12         | 20 - 56            | 10 x 3.4         | 254 x 86     | 39        | 17.7    |
| L5005       | 50               | 35.3        | 5      | 6.25       | 11 - 35            | 8.0 x 3.0        | 203 x 76     | 23        | 10.4    |
| L5010       | 50               | 35.3        | 10     | 12.5       | 20 - 57.5          | 10.0 x 3.4       | 254 x 86     | 39        | 17.7    |
| L6005       | 60               | 42.4        | 5      | 9          | 12 - 43.2          | 8.0 x 3.5        | 203 x 89     | 29        | 13.2    |

Substantial benefits may be derived from the use of toroids as long as thought is given to their application. The following two considerations are important.

## A) Shorted Turn Condition

A completed path by any conductor passing through the center hole of the toroid around the outside constitutes a short circuited turn. As with any short circuit, this condition will result in high circulating currents and, more importantly, high heat.

Our standard mounting options utilize either a single bolt and large washer (disk mount) with no outside structure to act as a conductor, completing the circuit; or two metal flanges (flange mount) which clamp the toroidal like a sandwich with four bolts at the outer periphery, but nothing through the center. The L-Bracket and Clamping Bracket described are both designed to avoid a shorted turn condition.

## B) Inrush Currents

The excellent magnetic properties of the toroidal transformer and the high remanence of the grain-oriented silicon steel, under certain circumstances, occasionally leads to high inrush current at turn-on.

To prevent nuisance interruptions due to blown fuses or supply breakers, some simple precautions should be considered. As the power rating of the transformer increases, the potential effect of the inrush current becomes greater. The following table suggests different types of circuit protection according to the toroid's power rating.

In addition, in those applications where an even lower in-rush current is desired, AMVECO has developed several proprietary construction techniques. Without added circuitry, both the peak value and the duration of the in-rush current can be reduced. As a matter of fact, AMVECO has manufactured toroidal transformers without any in-rush current at all. In these cases, AMVECO works closely with the customer to meet the specific requirements of the application. A slight increase in the overall size of the transformer is sometimes necessary to facilitate the lower in-rush current.

| TRANSFORMER RATING | SUGGESTED PROTECTION                                                                  |
|--------------------|---------------------------------------------------------------------------------------|
| • 15 to 300VA      | None                                                                                  |
| • 300VA to 1.0kVA  | Slow-blow fuse in primary circuit                                                     |
| • 1.0 to 2.0kVA    | Small value resistor in series with primary circuit                                   |
| • 2.0kVA and up    | Relay momentarily inserts resistor in primary circuit at start-up, or NTC Thermistors |



*Applying Part of the Insulation System*

## VISIT OUR WEBSITE FOR DESIGN SERVICE

Company: \_\_\_\_\_ Date: \_\_\_\_\_

Contact Name: \_\_\_\_\_

Address: \_\_\_\_\_ Telephone: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Application: \_\_\_\_\_

Customer P/N: \_\_\_\_\_ ☐ New Program ☐ Existing Program

Quote Prices on: ☐ 1 ☐ 10 ☐ 25 ☐ 50 ☐ 100 ☐ 250 ☐ 500 ☐ 1000 ☐ 2500 ☐ 5000 ☐ 10000 ☐ 25000

### ELECTRICAL DATA

• Total Power Rating (VA): \_\_\_\_\_ Duty Cycle \_\_\_\_\_ %

• Input Voltages: ☐ 100V ☐ 120V ☐ 208V ☐ 230V ☐ 240V ☐ 277V ☐ Other: \_\_\_\_\_ V

• Line Frequency: ☐ 60Hz ☐ 50/60Hz ☐ Other: \_\_\_\_\_ Hz

• Thermal Protection: ☐ Auto Resettable ☐ Non-resettable • Trip Temperature: \_\_\_\_\_ °C

• Maximum Temperature Rise Over Ambient: \_\_\_\_\_ °C • Ambient Temperature: \_\_\_\_\_ °C

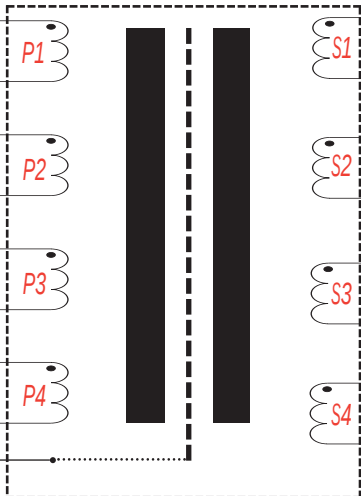
### PHYSICAL DATA

• Maximum Diameter: \_\_\_\_\_ Maximum Height: \_\_\_\_\_ ☐ Not Critical

• Mounting Method: ☐ Standard Steel Washer/Insulating Pads ☐ L-Bracket for Vertical Mounting  
☐ Potted Center Drilled Hole or Threaded Insert ☐ Enclosure  
☐ Clamping Bracket ☐ Flanges ☐ Other \_\_\_\_\_

• Safety Agency Requirements: ☐ UL ☐ CSA ☐ IEC ☐ EN ☐ CE ☐ Medical

• Specify Which Safety Standard: \_\_\_\_\_

|                                    |             |                                                                                     |             |                        |                        |              |            |
|------------------------------------|-------------|-------------------------------------------------------------------------------------|-------------|------------------------|------------------------|--------------|------------|
| Length _____                       | Color _____ |  | Color _____ | Length _____           | Rect _____             |              |            |
| Length _____                       | Color _____ |                                                                                     | _____ Volts | P1                     | _____ Volts _____ Amps | AC or DC     | Cap _____  |
| Length _____                       | Color _____ |                                                                                     | _____ Volts | P2                     | _____ Volts _____ Amps | AC or DC     | Rect _____ |
| Length _____                       | Color _____ |                                                                                     | _____ Volts | P3                     | _____ Volts _____ Amps | AC or DC     | Cap _____  |
| Length _____                       | Color _____ |                                                                                     | _____ Volts | P4                     | _____ Volts _____ Amps | AC or DC     | Rect _____ |
| Length _____                       | Color _____ |                                                                                     | _____ Volts | S1                     | _____ Volts _____ Amps | AC or DC     | Cap _____  |
| Length _____                       | Color _____ |                                                                                     | _____ Volts | S2                     | _____ Volts _____ Amps | AC or DC     | Rect _____ |
| Length _____                       | Color _____ | _____ Volts                                                                         | S3          | _____ Volts _____ Amps | AC or DC               | Cap _____    |            |
| Length _____                       | Color _____ | _____ Volts                                                                         | S4          | _____ Volts _____ Amps | AC or DC               | Rect _____   |            |
| Electrostatic Screen (2 mil) _____ |             | Color _____                                                                         |             |                        |                        | Length _____ |            |
|                                    |             | Magnetic Shield                                                                     |             |                        |                        |              |            |

If DC values are listed, please tell us the type of rectifier circuitry and capacitance values.