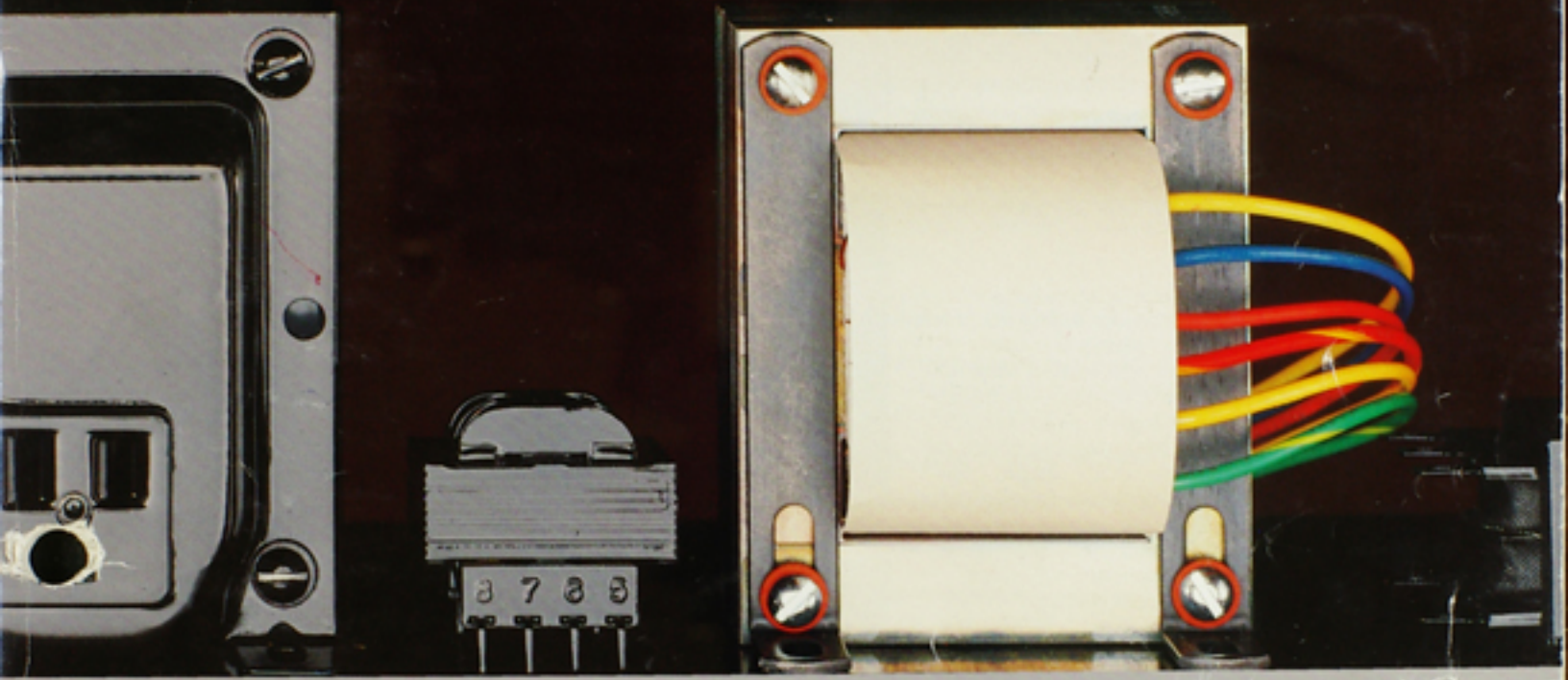
# Triad-Utrad Transformers 1987-1988

*Transformers · Inductors · Power Supplies*



TRIAD-UTRAD

A Division of Magnetek, Inc.

# *Total Facilities to Serve Industry*

## *Engineering and Development*

Triad's design engineering staff employs their combined experience of hundreds of years in the lab and field to keep Triad-Utrad at the forefront of magnetics technology.

Aided by modern test laboratories and a complete sample shop, our engineering staff has dependable expertise to support your own design facilities with production solutions as innovative as our designs.

We maintain close working relationships with all domestic and many international agencies, including UL, BSA, VDE, CSA, IEC and others. This means we can design to the specifications you require.

## *Manufacturing*

Triad-Utrad maintains manufacturing facilities with modern and efficient plants for the production of transformers and related magnetic components. State-of-the-art production equipment and facilities plus a highly skilled workforce enable us to meet the complete range of OEM custom requirements—from simple coils to fully assembled power supplies—in quantities from prototype to millions of units.

Manufacturing is supported by complete purchasing capabilities to procure whatever electronic component is needed. High manufacturing productivity, statistical process controls in key production processes, and sophisticated production equipment enable us to meet the most difficult just-in-time delivery requirements and maintain quality that has become an industry standard.

## *Quality Assurance*

Our formal quality assurance system verifies that your specifications are consistently met or surpassed. We maintain accurate statistical process controls on our product and test all incoming components to MIL-STD-105D. Continued inspection of wire, core, insulation and other components, combined with our supplier quality assurance program, virtually eliminates imperfections.

## *Standard Transformers*

Triad maintains a multimillion-dollar inventory of thousands of transformer designs. These transformers are available off the shelf from one of Triad's nationwide stocking distributors or for 24-hour shipment from the factory. Sales representatives provide local application engineering and sales assistance.

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## DEFINITION OF TERMS

AMPERE: A unit of electrical current. One volt across one ohm of resistance causes a current flow of one ampere.

AUDIO TRANSFORMER: An iron-core transformer for use with audio-frequency currents to transfer signals from one circuit to another. Used for impedance matching to permit maximum transfer of power.

AUTOTRANSFORMER: A transformer with a single winding (electrically) in which the whole winding acts as the primary winding, and only part of the winding acts as the secondary (step down); or part of the winding acts as the primary and the whole winding acts as the secondary (step up). A voltage, current, or impedance transforming device in which parts of one winding are common to both primary and secondary parts of the circuit.

BRIDGING TRANSFORMER: A transformer designed to couple two circuits having at least nominal ohmic isolation and operating at different impedance levels, without introducing significant frequency or phase distortion.

CHOKE: An inductor (reactor) used to limit or suppress the flow of alternating current without appreciable effect on the flow of direct current.

CURRENT: The movement of electrons through a conductor. Current is measured in amperes.

IMPEDANCE: The total opposition (i.e., resistance and reactance) a circuit offers to the flow of alternating current at a given frequency. It is measured in ohms.

ISOLATION: Electrical separation between two locations.

ISOLATION TRANSFORMER: A transformer designed to provide magnetic coupling (flux coupling) between one or more pairs of isolated circuits, without introducing significant coupling.

LINE MATCHING: A transformer inserted into a system for such purposes as isolation, impedance matching, or additional circuit derivation.

LINE VOLTAGE CORRECTION (STABILIZATION): A device that counteracts variations in the powerline voltage and delivers a constant voltage to the connected load.

POWER TRANSFORMER: A transformer used for raising or lowering the supply voltage to the various values required by the device being operated.

RESISTANCE: A property of conductors which determines the current produced by a given difference of potential. The practical unit of resistance is the ohm.

RMS TEST VOLTAGE: A test voltage for determining the breakdown point of insulating materials and spacings. It consists of applying a voltage higher than the rated voltage between two points or between two or more windings.

TOROIDAL: A coil wound in the form of a toroidal helix. TOROID: A highly efficient type of coil wound upon a ring or 'doughnut' type of core. The toroid provides for high concentrated magnetic field within itself, and has a minimum magnetic flux leakage (external field).

VA: Abbreviation for volt-ampere.

VOLTAGE: Electrical pressure, i.e., the force which causes current to flow through an electrical conductor.

VOLT-AMPERE: Abbreviated VA. A unit of apparent power in an ac circuit containing reactance. It is equal to the potential in volts multiplied by the current in amperes, without taking phase into consideration.

WATT: A measure of electrical power.

WATTAGE: The maximum power that a device can safely handle.

# Catalog Index

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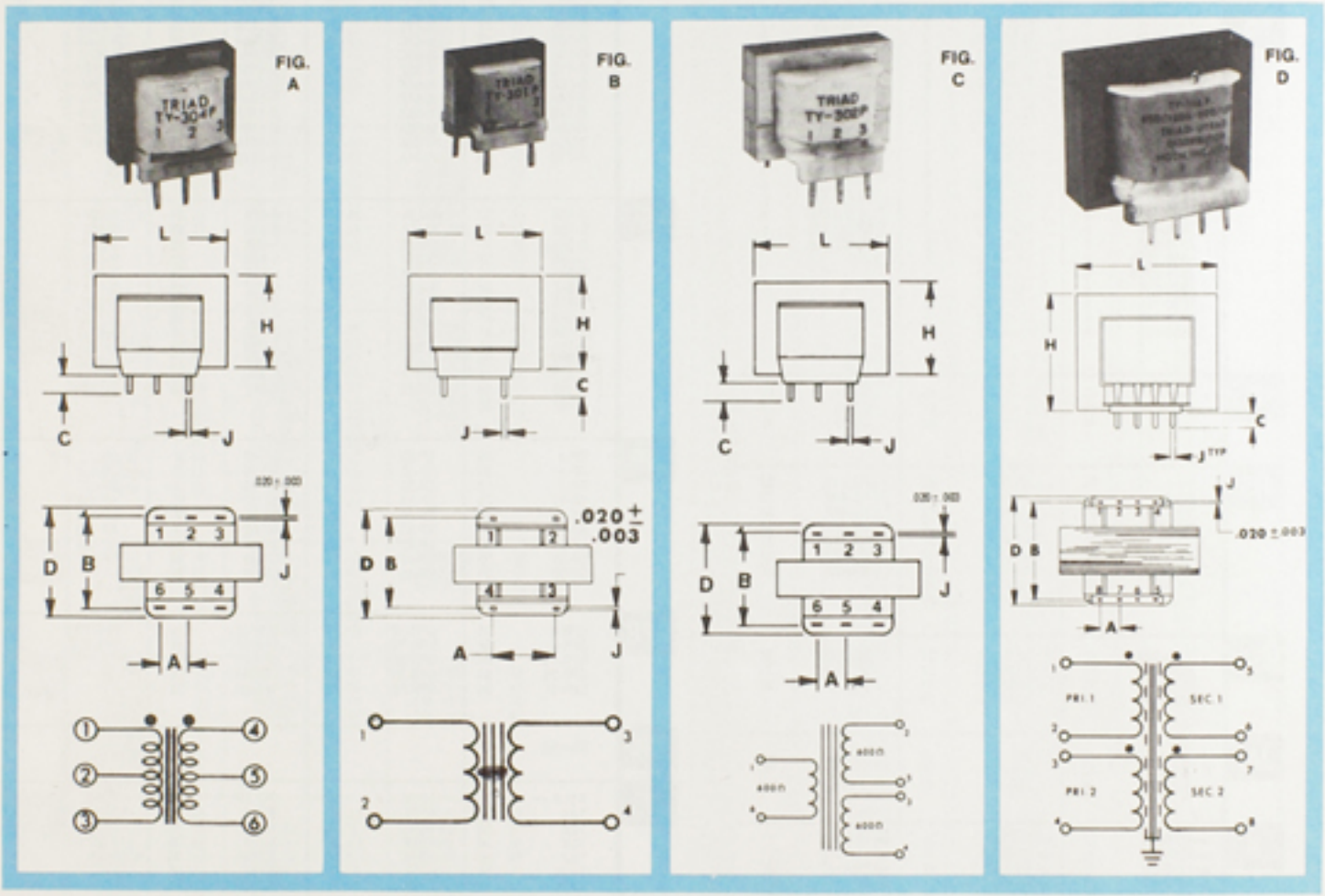
☛ New Item

☛ New Item

## PLUG-IN PRINTED CIRCUIT AUDIO TRANSFORMERS

| Type No. | Fig. | Output MW | Primary Impedance | Secondary Impedance | Pri. D.C. Unbalance | Dimensions H | D | L | A | B | C. | J. | Wt. Oz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TY-141P | A | 100 | 10,000 CT | 10,000 CT | 4 ma. | 5/8 | 15/32 | 13/16 | 5/16 | 21/64 | 5/16 | .042 | 1 |
| TY-142P | A | 100 | 10,000 CT | 2,000 CT | 4 ma. | 5/8 | 15/32 | 13/16 | 5/16 | 21/64 | 5/16 | .042 | 1 |
| TY-143P | A | 100 | 10,000 CT | 1,500 CT | 4 ma. | 5/8 | 15/32 | 13/16 | 5/16 | 21/64 | 5/16 | .042 | 1 |
| TY-144P | A | 100 | 15,000 CT | 15,000 CT | 4 ma. | 5/8 | 15/32 | 13/16 | 5/16 | 21/64 | 5/16 | .042 | 1 |
| TY-145P | A | 100 | 600 CT | 600 CT | 15 ma. | 5/8 | 15/32 | 13/16 | 5/16 | 21/64 | 5/16 | .042 | 1 |
| TY-146P | D | 1 watt | 600 CT/150§ | 600 CT/150§ | — | 1 1/8 | 1 1/8 | 1 5/8 | 13/64 | 1 11/32 | 5/16 | .042 | 3 |
| TY-147P | A | 100 | 150 CT | 600 CT | 15 ma. | 5/8 | 15/32 | 13/16 | 5/16 | 21/64 | 5/16 | .042 | .5 |

## Schematics, Dimensions, Pin Locations for All Plug-In Printed Circuit Audio Transformers




## TELEPHONE COUPLING TRANSFORMERS

**Frequency Response:** 300-3500 Hz ±0.5 db
**Longitudinal Balance:** 45 db min.
**Return Loss:** 26 db min.
**Distortion:** 0.5% max.

**Impedance Matching:** ±10% over entire frequency range
**Power Level:** −45 dbm to +7 dbm.
**Dielectric:** 1500 VRMS
**Send for Engineering Bulletin TCT-74**

| Type No. | Fig. No. | Application | Pri. Imp | Sec. Imp | Dimensions H | D | L | A | B | Pin Dim. C | J | Wt. Oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TY-300P | C | Hybrid* | 600 | 600/600 | 5/8 | 35/64 | 3/4 | 5/16 | 27/64 | 13/64 | .041 | 3.2 |
| TY-301P | B | Coupling | 600 | 900 | 5/8 | 35/64 | 3/4 | 3/8 | 27/64 | 13/64 | .041 | 3.2 |
| TY-302P | C | Hybrid* | 600 | 600/600 | 5/8 | 15/16 | 1 | 13/64 | 27/32 | 13/64 | .041 | 3.2 |
| TY-303P | B | Bridging | 4000 | 600 | 5/8 | 35/64 | 3/4 | 3/8 | 27/64 | 13/64 | .041 | 3.2 |
| TY-304P | A | Coupling | 600 CT | 600 CT | 5/8 | 35/64 | 3/4 | 5/16 | 27/64 | 5/16 | .041 | 4.8 |
| TY-350P | — | Holding Coil | 2.0 hy @ 60 ma, 1.3 hy @ 100 maDC, 180 ohms DCR | | 1 1/8 | 21/32 | 1 7/16 | 3/8 | 1 | 1/4 | .041 | 4.8 |

*Two required for hybrid operation. **CT** for Center Tap. §Split winding.

Triad-Utrad has introduced a new line of attractively priced telephone coupling transformers for use in work areas where several telephones are connected to a single incoming-outgoing line. The new TY-PR Series similar to our current TY300P transformers are adaptable for hybrid, bridging or coupling applications. These units comply with FCC Rules Part 68.

Connections for transmission and receiving are made possible by means of transformers. Transformers provide proper impedance coupling as well as the necessary balance and isolation requirements. These requirements are very similar to those associated with telephone repeater and termination sets. Coupling transformers provide suitable means of impedance matching, balancing through close coupling, and isolation. All of these parameters must be taken into consideration so that existing line characteristics are maintained and not degraded. Proper transmission line loading is based upon the characteristic impedance of the line, which has attenuation and propagation.

## Specifications

**Frequency Response:** 300-3500 Hz ±0.5 db
**Longitudinal Balance:** 45 db min.
**Return Loss:** 26 db min.
**Distortion:** 0.5% max.
**Impedance Matching:** ±10% over entire frequency range
**Power Level:** −45 dbm to +7 dbm
**Dielectric:** 1500 VRMS

## Longitudinal Balance

The application of good balance within the transformer will help provide for a lower longitudinal noise current to be introduced into the telephone system. In order to maintain good longitudinal balance characteristic, Triad-Utrad units are designed to meet a minimum of 45 db.

## "Reflection" Loss or Return Loss

Reflection loss is the amount of impedance discontinuity between the transmission line and the impedance matching device which causes reflection of energy. The amount of reflection loss is dependent upon the ratio of both the transmission line impedance and the reflected load impedance or transformer primary impedance. Triad-Utrad interconnection transformers are designed to conform to a 26 db minimum reflection loss in order to maintain good transmission characteristics.

## Insertion Loss

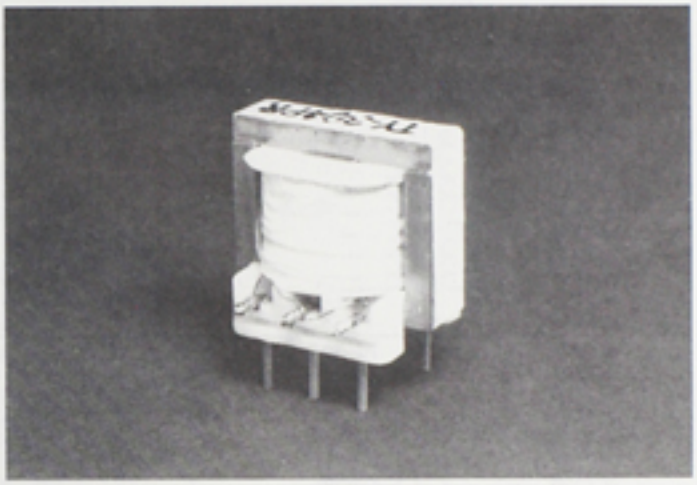
A comparison of the amount of power available with the interconnection transformer in the circuit to the amount of power available without the interconnection transformer in the circuit is called "Insertion Loss". Transformer insertion loss variation over the bandpass of interest should not vary more than .5 db and exceed a total insertion loss of 3 db. The maintained insertion loss for Triad-Utrad interconnection transformers is 3 db maximum.

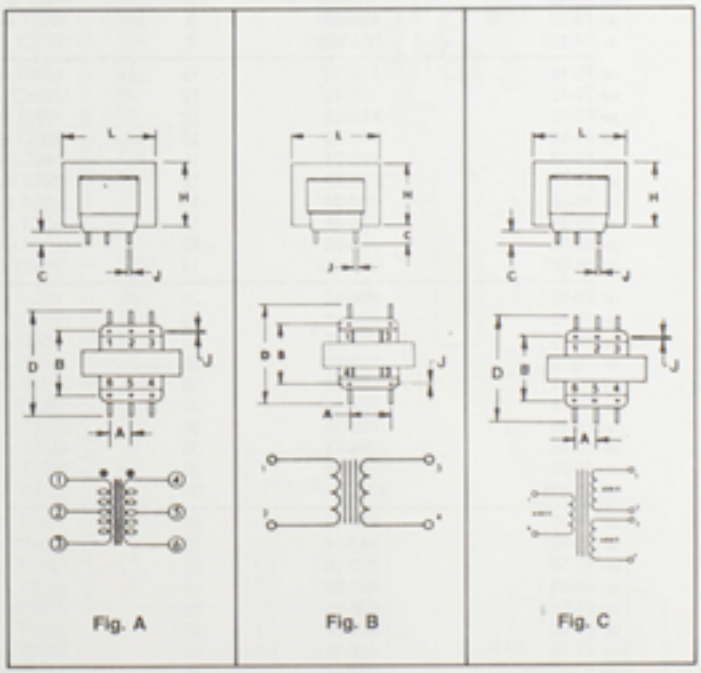
## Harmonic Distortion

All of Triad-Utrad interconnection transformers are tested with all windings loaded to proper matching impedance, then checked at a frequency of 275 hertz. All Triad-Utrad interfacing transformers have a harmonic distortion of less than .5 percent as the maximum specification.

## Frequency Response

Typical interconnection transformers should have a frequency response that remains within ±.5 db throughout a spectrum of 300 hertz to 3400 hertz. Triad-Utrad interconnection transformers have a dynamic frequency response of 275 hertz through 3500 hertz ±.5 db.






| Type No. | Fig. No. | Application | Pri. Imp | Sec. Imp. | Dimensions (inches) H | D | L | A | B | Pin Dim. C | J | Wt. Oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ☛ TY-300PR | C | Hybrid* | 600 | 600/600 | 1/8 | 11/64 | 1/4 | 1/32 | 21/64 | 13/64 | .025 SQ. | .51 |
| ☛ TY-301PR | B | Coupling | 600 | 900 | 1/8 | 11/64 | 1/4 | 1/8 | 21/64 | 13/64 | .025 SQ. | .51 |
| ☛ TY-302PR | C | Hybrid* | 600 | 600/600 | 1/4 | 1 1/32 | 1 | 13/64 | 25/32 | 13/64 | .025 SQ. | 1.06 |
| ☛ TY-303PR | B | Bridging | 4000 | 600 | 1/8 | 11/64 | 1/4 | 1/8 | 21/64 | 13/64 | .025 SQ. | .51 |
| ☛ TY-304PR | A | Coupling | 600 CT | 600 CT | 1/8 | 11/64 | 1/4 | 1/32 | 21/64 | 13/64 | .025 SQ. | .51 |

☛ New Item *Two required for hybrid operation. CT for Center Tap.

# Quick Pack Power

TRIAD-UTRAD
A Division of Magnetek, Inc.

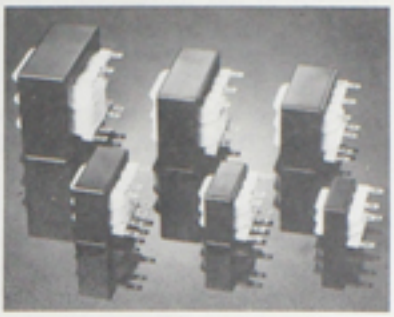
Presenting the Quick Pack series, the latest addition to Triad-Utrad's extensive line-up of small power transformers.

Quick Pack transformers can offer a significant reduction in size and weight for a given VA rating. Plus, these transformers come with a special quick-connect or solder terminal. Quick Pack transformers are available in six sizes for a wide variety of applications.

**Bobbin Wound** — Reduces transformer size and space.

**Split Bobbin Non-Concentric Winding** — Eliminates costly electrostatic shielding. The Quick Pack transformer's unique construction makes possible higher HiPot testing, 2500V rather than 1500V.

This series is available with single 115V or dual 115/230V primary, rated 50/60 Hz, Class B insulation insures maximum total temperature of 130°C continuous.



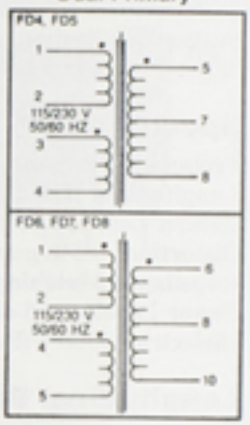
## 50/60 HZ Primary

| 115V | 115-230V | VA | OUTPUT RATING |
|---|---|---|---|
| F3-10 | — | 2.4 | 10VCT @ 0.25A |
| F3-12 | — | 2.4 | 12.6VCT @ 0.2A |
| F3-16 | — | 2.4 | 16VCT @ 0.15A |
| F3-20 | — | 2.4 | 20VCT @ 0.12A |
| F3-24 | — | 2.4 | 24VCT @ 0.1A |
| F3-28 | — | 2.4 | 28VCT @ 0.085A |
| F3-36 | — | 2.4 | 36VCT @ 0.065A |
| F3-48 | — | 2.4 | 48VCT @ 0.05A |
| F3-56 | — | 2.4 | 56VCT @ 0.045A |
| F3-120 | — | 2.4 | 120VCT @ 0.02A |
| F4-10 | FD4-10 | 6 | 10VCT @ 0.6A |
| F4-12 | FD4-12 | 6 | 12.6VCT @ 0.5A |
| F4-16 | FD4-16 | 6 | 16VCT @ 0.4A |
| F4-20 | FD4-20 | 6 | 20VCT @ 0.3A |
| F4-24 | FD4-24 | 6 | 24VCT @ 0.25A |
| F4-28 | FD4-28 | 6 | 28VCT @ 0.2A |
| F4-36 | FD4-36 | 6 | 36VCT @ 0.17A |
| F4-48 | FD4-48 | 6 | 48VCT @ 0.125A |
| F4-56 | FD4-56 | 6 | 56VCT @ 0.11A |
| F4-120 | FD4-120 | 6 | 120VCT @ 0.05A |
| F5-10 | FD5-10 | 12 | 10VCT @ 1.2A |
| F5-12 | FD5-12 | 12 | 12.6VCT @ 1.0A |
| F5-16 | FD5-16 | 12 | 16VCT @ 0.8A |
| F5-20 | FD5-20 | 12 | 20VCT @ 0.6A |
| F5-24 | FD5-24 | 12 | 24VCT @ 0.5A |
| F5-28 | FD5-28 | 12 | 28VCT @ 0.42A |
| F5-36 | FD5-36 | 12 | 36VCT @ 0.35A |
| F5-48 | FD5-48 | 12 | 48VCT @ 0.25A |
| F5-56 | FD5-56 | 12 | 56VCT @ 0.22A |
| F5-120 | FD5-120 | 12 | 120VCT @ 0.1A |
| F6-10 | FD6-10 | 30 | 10VCT @ 3.0A |
| F6-12 | FD6-12 | 30 | 12.6VCT @ 2.5A |
| F6-16 | FD6-16 | 30 | 16VCT @ 2.0A |
| F6-20 | FD6-20 | 30 | 20VCT @ 1.5A |
| F6-24 | FD6-24 | 30 | 24VCT @ 1.25A |
| F6-28 | FD6-28 | 30 | 28VCT @ 1.1A |
| F6-36 | FD6-36 | 30 | 36VCT @ 0.85A |
| F6-48 | FD6-48 | 30 | 48VCT @ 0.63A |
| F6-56 | FD6-56 | 30 | 56VCT @ 0.54A |
| F6-120 | FD6-120 | 30 | 120VCT @ 0.25A |
| F7-10 | FD7-10 | 56 | 10VCT @ 5.0A |
| F7-12 | FD7-12 | 56 | 12.6VCT @ 4.0A |
| F7-16 | FD7-16 | 56 | 16VCT @ 3.5A |
| F7-20 | FD7-20 | 56 | 20VCT @ 2.8A |
| F7-24 | FD7-24 | 56 | 24VCT @ 2.4A |
| F7-28 | FD7-28 | 56 | 28VCT @ 2.0A |
| F7-36 | FD7-36 | 56 | 36VCT @ 1.5A |
| F7-48 | FD7-48 | 56 | 48VCT @ 1.2A |
| F7-56 | FD7-56 | 56 | 56VCT @ 1.0A |
| F7-120 | FD7-120 | 56 | 120VCT @ 0.5A |
| F8-10 | FD8-10 | 100 | 10VCT @ 10.0A |
| F8-12 | FD8-12 | 100 | 12.6VCT @ 8.0A |
| F8-16 | FD8-16 | 100 | 16VCT @ 6.25A |
| F8-20 | FD8-20 | 100 | 20VCT @ 5.0A |
| F8-24 | FD8-24 | 100 | 24VCT @ 4.0A |
| F8-28 | FD8-28 | 100 | 28VCT @ 3.6A |
| F8-36 | FD8-36 | 100 | 36VCT @ 2.8A |
| F8-48 | FD8-48 | 100 | 48VCT @ 2.0A |
| F8-56 | FD8-56 | 100 | 56VCT @ 1.8A |
| F8-120 | FD8-120 | 100 | 120VCT @ 0.85A |

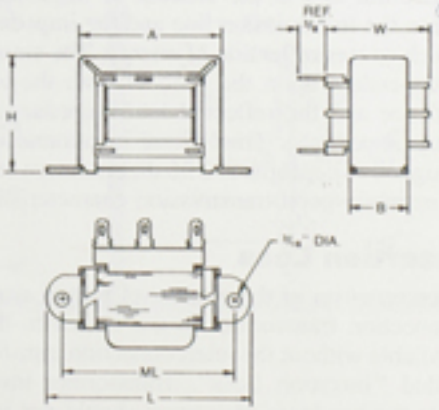
New Item

Single Primary


Dual Primary




UL Recognized
Class B




**NOTES:** Terminals to be quick-connect (.187) or solder lug terminals.
Dielectric strength: 2500 V.
• Indicates like polarity.

## Dimensions

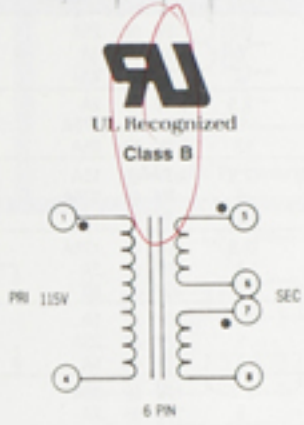
| Size | VA | L | W | H | A | B | ML | Lbs |
|---|---|---|---|---|---|---|---|---|
| F3 | 2.4 | 2 1/16 | 1 1/16 | 1 3/16 | 1 1/16 | 9/16 | 1 3/4 | |
| F4 & FD4 | 6 | 2 1/16 | 1 1/4 | 1 3/16 | 1 11/16 | 11/16 | 2 | 0.44 |
| F5 & FD5 | 12 | 2 3/16 | 1 3/16 | 1 3/16 | 1 15/16 | 13/16 | 2 1/16 | 0.7 |
| F6 & FD6 | 30 | 3 1/4 | 1 11/16 | 1 15/16 | 2 15/16 | 1 1/16 | 2 15/16 | 1.1 |
| F7 & FD7 | 56 | 3 5/16 | 1 15/16 | 2 1/4 | 2 11/16 | 1 1/16 | 3 1/8 | 1.7 |
| F8 & FD8 | 100 | 4 1/32 | 2 1/4 | 2 9/16 | 3 1/16 | 1 5/16 | 3 5/16 | 2.75 |

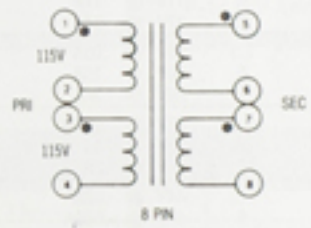
## Split Bobbin Transformer

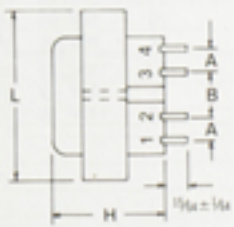
Triad-Utrad's new Split Pack split bobbin transformer increases the depth and versatility of Triad's already extensive line of PC board mounted transformers. Like Triad's recent Flat Pack™ series, the Split Pack transformers are nonconcentrically wound—with primary and secondaries wound side by side, unlike the secondary-on-top-of-primary windings of standard PC board transformers. Split bobbin winding and low capacitive coupling eliminate costly electrostatic shielding. The Split Pack's unique construction make possible higher HiPot testing—2,500V rather than 1,500V.

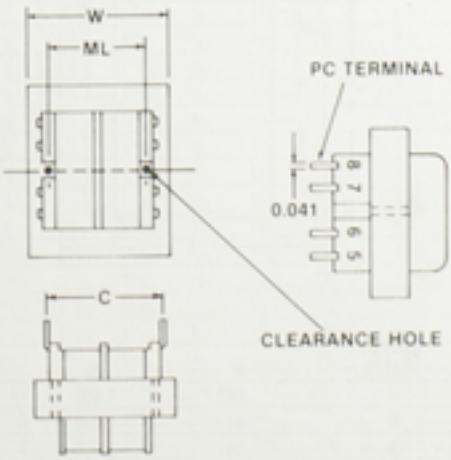

## 50/60 Hz Dual Secondary

| PRIMARY | | VA | SECONDARY RATINGS (RMS) | | |
|---|---|---|---|---|---|
| | | | INDIVIDUAL | SERIES | PARALLEL |
| 115V 6 PIN | 115-230V 8 PIN | | | | |
| F10-110 | FS10-110 | 1.1 | 5V @ .11A | 10V CT @ .11A | 5V @ .22A |
| F10-250 | FS10-250 | 2.5 | 5V @ .25A | 10V CT @ .25A | 5V @ .5A |
| F10-600 | FS10-600 | 6 | 5V @ .6A | 10V CT @ .6A | 5V @ 1.2A |
| F10-1200 | FS101200 | 12 | 5V @ 1.2A | 10V CT @ 1.2A | 5V @ 2.4A |
| F10-2000 | FS102000 | 20 | 5V @ 2A | 10V CT @ 2A | 5V @ 4A |
| F10-3600 | FS103600 | 36 | 5V @ 3.6A | 10V CT @ 3.6A | 5V @ 7.2A |
| F12-090 | FS12-090 | 1.1 | 6.3V @ .09A | 12.6V CT @ .09A | 6.3V @ .18A |
| F12-200 | FS12-200 | 2.5 | 6.3V @ .2A | 12.6V CT @ .2A | 6.3V @ .4A |
| F12-500 | FS12-500 | 6 | 6.3V @ .5A | 12.6V CT @ .5A | 6.3V @ 1.0A |
| F12-1000 | FS121000 | 12 | 6.3V @ 1.0A | 12.6V CT @ 1.0A | 6.3V @ 2.0A |
| F12-1600 | FS121600 | 20 | 6.3V @ 1.6A | 12.6V CT @ 1.6A | 6.3V @ 3.2A |
| F12-2850 | FS122850 | 36 | 6.3V @ 2.85A | 12.6V CT @ 2.85A | 6.3V @ 5.7A |
| F16-070 | FS16-070 | 1.1 | 8V @ .07A | 16V CT @ .07A | 8V @ .14A |
| F16-150 | FS16-150 | 2.5 | 8V @ .15A | 16V CT @ .15A | 8V @ .3A |
| F16-400 | FS16-400 | 6 | 8V @ .4A | 16V CT @ .4A | 8V @ .8A |
| F16-800 | FS16-800 | 12 | 8V @ .8A | 16V CT @ .8A | 8V @ 1.6A |
| F16-1250 | FS161250 | 20 | 8V @ 1.25A | 16V CT @ 1.25A | 8V @ 2.5A |
| F16-2250 | FS162250 | 36 | 8V @ 2.25A | 16V CT @ 2.25A | 8V @ 4.5A |
| F20-055 | FS20-055 | 1.1 | 10V @ .055A | 20V CT @ .055A | 10V @ .11A |
| F20-120 | FS20-120 | 2.5 | 10V @ .12A | 20V CT @ .12A | 10V @ .24A |
| F20-300 | FS20-300 | 6 | 10V @ .3A | 20V CT @ .3A | 10V @ .6A |
| F20-600 | FS20-600 | 12 | 10V @ .6A | 20V CT @ .6A | 10V @ 1.2A |
| F20-1000 | FS201000 | 20 | 10V @ 1.0A | 20V CT @ 1.0A | 10V @ 2A |
| F20-1800 | FS201800 | 36 | 10V @ 1.8A | 20V CT @ 1.8A | 10V @ 3.6A |
| F24-045 | FS24-045 | 1.1 | 12V @ .045A | 24V CT @ .045A | 12V @ .09A |
| F24-100 | FS24-100 | 2.5 | 12V @ .1A | 24V CT @ .1A | 12V @ .2A |
| F24-250 | FS24-250 | 6 | 12V @ .25A | 24V CT @ .25A | 12V @ .5A |
| F24-500 | FS24-500 | 12 | 12V @ .5A | 24V CT @ .5A | 12V @ 1.0A |
| F24-800 | FS24-800 | 20 | 12V @ .8A | 24V CT @ .8A | 12V @ 1.6A |
| F24-1500 | FS241500 | 36 | 12V @ 1.5A | 24V CT @ 1.5A | 12V @ 3A |
| F28-040 | FS28-040 | 1.1 | 14V @ .04A | 28V CT @ .04A | 14V @ .08A |
| F28-85 | FS28-85 | 2.5 | 14V @ .085A | 28V CT @ .085A | 14V @ .17A |
| F28-200 | FS28-200 | 6 | 14V @ .2A | 28V CT @ .2A | 14V @ .4A |
| F28-420 | FS28-420 | 12 | 14V @ .42A | 28V CT @ .42A | 14V @ .84A |
| F28-700 | FS28-700 | 20 | 14V @ .7A | 28V CT @ .7A | 14V @ 1.4A |
| F28-1300 | FS281300 | 36 | 14V @ 1.3A | 28V CT @ 1.3A | 14V @ 2.6A |
| F36-030 | FS36-030 | 1.1 | 18V @ .03A | 36V CT @ .03A | 18V @ .06A |
| F36-65 | FS36-65 | 2.5 | 18V @ .065A | 36V CT @ .065A | 18V @ .13A |
| F36-170 | FS36-170 | 6 | 18V @ .17A | 36V CT @ .17A | 18V @ .34A |
| F36-350 | FS36-350 | 12 | 18V @ .35A | 36V CT @ .35A | 18V @ .7A |
| F36-550 | FS36-550 | 20 | 18V @ .55A | 36V CT @ .55A | 18V @ 1.1A |
| F36-1000 | FS361000 | 36 | 18V @ 1A | 36V CT @ 1A | 18V @ 2A |
| F48-023 | FS48-023 | 1.1 | 24V @ .023A | 48V CT @ .023A | 24V @ .046A |
| F48-050 | FS48-050 | 2.5 | 24V @ .05A | 48V CT @ .05A | 24V @ .1A |
| F48-125 | FS48-125 | 6 | 24V @ .125A | 48V CT @ .125A | 24V @ .25A |
| F48-250 | FS48-250 | 12 | 24V @ .25A | 48V CT @ .25A | 24V @ .5A |
| F48-400 | FS48-400 | 20 | 24V @ .4A | 48V CT @ .4A | 24V @ .8A |
| F48-750 | FS48-750 | 36 | 24V @ .75A | 48V CT @ .75A | 24V @ 1.5A |
| F56-020 | FS56-020 | 1.1 | 28V @ .02A | 56V CT @ .02A | 28V @ .04A |
| F56-045 | FS56-045 | 2.5 | 28V @ .045A | 56V CT @ .045A | 28V @ .09A |
| F56-110 | FS56-110 | 6 | 28V @ .11A | 56V CT @ .11A | 28V @ .22A |
| F56-220 | FS56-220 | 12 | 28V @ .22A | 56V CT @ .22A | 28V @ .44A |
| F56-350 | FS56-350 | 20 | 28V @ .35A | 56V CT @ .35A | 28V @ .7A |
| F56-650 | FS56-650 | 36 | 28V @ .65A | 56V CT @ .65A | 28V @ 1.3A |
| F120-010 | FS120-01 | 1.1 | 60V @ .01A | 120V CT @ .01A | 60V @ .02A |
| F120-020 | FS120-02 | 2.5 | 60V @ .02A | 120V CT @ .02A | 60V @ .04A |
| F120-050 | FS120-05 | 6 | 60V @ .05A | 120V CT @ .05A | 60V @ .1A |
| F120-100 | FS120100 | 12 | 60V @ .1A | 120V CT @ .1A | 60V @ .2A |
| F120-160 | FS120160 | 20 | 60V @ .16A | 120V CT @ .16A | 60V @ .32A |
| F120-300 | FS120300 | 36 | 60V @ .3A | 120V CT @ .3A | 60V @ .6A |



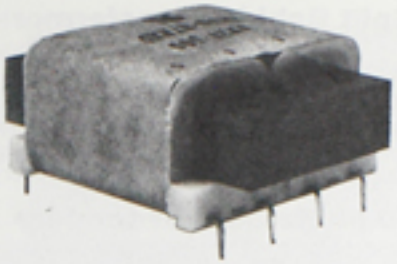




| VA | H | W | L | ML | A | B | C | WT |
|---|---|---|---|---|---|---|---|---|
| 1.1 | 15/16 | 1-1/8 | 1-3/8 | — | .250 | .250 | 1.200 | .17 |
| 2.5 | 1-3/16 | 1-1/8 | 1-3/8 | — | .250 | .250 | 1.20 | .25 |
| 6 | 1-5/16 | 1-5/16 | 1-5/8 | 1-1/16 | .250 | .350 | 1.280 | .44 |
| 12 | 1-7/16 | 1-9/16 | 1-7/8 | 1-1/4 | .300 | .400 | 1.410 | .70 |
| 20 | 1-7/16 | 1-7/8 | 2-1/4 | 1-1/2 | .300 | .400 | 1.600 | .80 |
| 36 | 1-9/16 | 2-3/16 | 2-5/8 | ! | .400 | .400 | 1.850 | 1.1 |

! 36VA size has 4 mtg. holes on 2-3/16 × 1-3/4 centers

# Flat Pack Power

TRIAD-UTRAD
A Division of Magnetek, Inc.

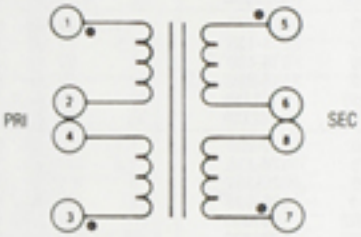


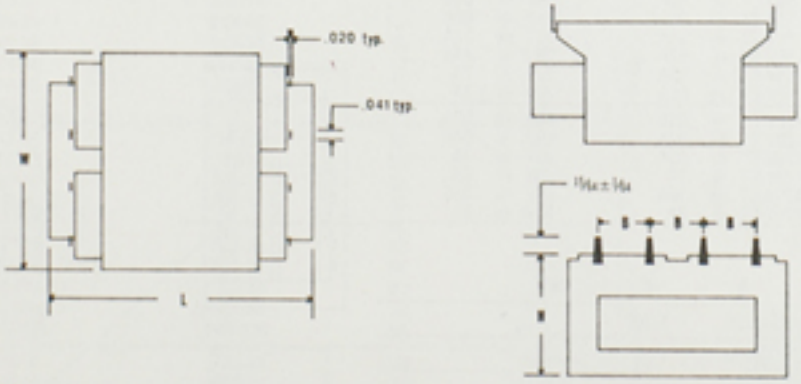
Triad-Utrad's new Flat Pack power transformer is designed to meet the needs of low clearance printed circuit board and solid state power designs. These new units can also be used for control and instrumentation applications. Voltages and currents were chosen for widely used power applications and could be used in single or dual output supplies. The Triad-Utrad Flat Pack has a unique construction feature allowing them to pass a 2000V HiPot test.

## 115-230 Volts, 50-60 Hz Dual Primary/Dual Secondary

| TYPE NO. | OUTPUT WATTS | INDIVIDUAL | SECONDARY SERIES | PARALLEL |
|---|---|---|---|---|
| FP10-250 | 2.5 | 5V @ .25A | 10V CT @ .25A | 5V @ .5A |
| FP10-600 | 6 | 5V @ .6A | 10V CT @ .6A | 5V @ 1.2A |
| FP101200 | 12 | 5V @ 1.2A | 10V CT @ 1.2A | 5V @ 2.4A |
| FP12-200 | 2.5 | 6.3V @ .2A | 12.6V CT @ .2A | 6.3V @ .4A |
| FP12-475 | 6 | 6.3V @ .475A | 12.6V CT @ .475A | 6.3V @ .95A |
| FP12-950 | 12 | 6.3V @ .95A | 12.6V CT @ .95A | 6.3V @ 1.9A |
| FP16-150 | 2.5 | 8V @ .15A | 16V CT @ .15A | 8V @ .3A |
| FP16-375 | 6 | 8V @ .375A | 16V CT @ .375A | 8V @ .75A |
| FP16-750 | 12 | 8V @ .75A | 16V CT @ .75A | 8V @ 1.5A |
| FP20-125 | 2.5 | 10V @ .125A | 20V CT @ .125A | 10V @ .25A |
| FP20-300 | 6 | 10V @ .3A | 20V CT @ .3A | 10V @ .6A |
| FP20-600 | 12 | 10V @ .6A | 20V CT @ .6A | 10V @ 1.2A |
| FP24-100 | 2.5 | 12V @ .1A | 24V CT @ .1A | 12V @ .2A |
| FP24-250 | 6 | 12V @ .25A | 24V CT @ .25A | 12V @ .5A |
| FP24-500 | 12 | 12V @ .5A | 24V CT @ .5A | 12V @ 1.0A |
| FP30-85 | 2.5 | 15V @ .08A | 30V CT @ .08A | 15V @ .16A |
| FP30-200 | 6 | 15V @ .2A | 30V CT @ .2A | 15V @ .4A |
| FP30-400 | 12 | 15V @ .4A | 30V CT @ .4A | 15V @ .8A |
| FP34-75 | 2.5 | 17V @ .075A | 34V CT @ .075A | 17V @ .15A |
| FP34-170 | 6 | 17V @ .17A | 34V CT @ .17A | 17V @ .34A |
| FP34-340 | 12 | 17V @ .34A | 34V CT @ .34A | 17V @ .68A |
| FP40-60 | 2.5 | 20V @ .06A | 40V CT @ .06A | 20V @ .12A |
| FP40-150 | 6 | 20V @ .15A | 40V CT @ .15A | 20V @ .3A |
| FP40-300 | 12 | 20V @ .3A | 40V CT @ .3A | 20V @ .6A |
| FP56-45 | 2.5 | 28V @ .045A | 56V CT @ .045A | 28V @ .09A |
| FP56-100 | 6 | 28V @ .1A | 56V CT @ .1A | 28V @ .2A |
| FP56-200 | 12 | 28V @ .2A | 56V CT @ .2A | 28V @ .4A |
| FP88-28 | 2.5 | 44V @ .028A | 88V CT @ .028A | 44V @ .056A |
| FP88-65 | 6 | 44V @ .065A | 88V CT @ .065A | 44V @ .13A |
| FP88-130 | 12 | 44V @ .13A | 88V CT @ .13A | 44V @ .26A |
| FP120-20 | 2.5 | 60V @ .02A | 120V CT @ .02A | 60V @ .04A |
| FP120-50 | 6 | 60V @ .05A | 120V CT @ .05A | 60V @ .1A |
| FP120100 | 12 | 60V @ .1A | 120V CT @ .1A | 60V @ .2A |
| FP230-10 | 2.5 | 115V @ .01A | 230V CT @ .01A | 115V @ .02A |
| FP230-25 | 6 | 115V @ .025A | 230V CT @ .025A | 115V @ .05A |
| FP230-50 | 12 | 115V @ .05A | 230V CT @ .05A | 115V @ .1A |

UL Recognized
Class B




| OUTPUT WATTS | H | W | L | A | B | WT OZ |
|---|---|---|---|---|---|---|
| 2.5 | .650 | 1.562 | 1.875 | 1.600 | .375 | 5 |
| 6 | .875 | 1.562 | 1.875 | 1.600 | .375 | 7 |
| 12 | 1.062 | 2.000 | 2.500 | 2.000 | .500 | 11 |

### Specifications:

**Primary**
115/230
50/60Hz

**Flat Pack** = allows ¾" card spacing for 2.5VA units, 1" card spacing for 6VA units or 1¼" for 12VA units

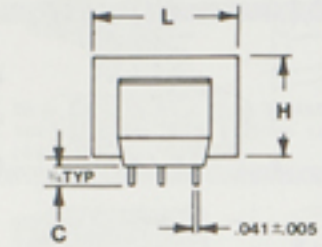
**Split Bobbin** = side by side windings reduce interwinding capacitance and eliminates the need for a static shield

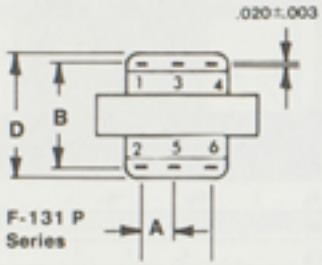
**Semi-Toroidal Construction** reduces radiated magnetic fields and results in balanced windings

**Terminals** are precision spaced

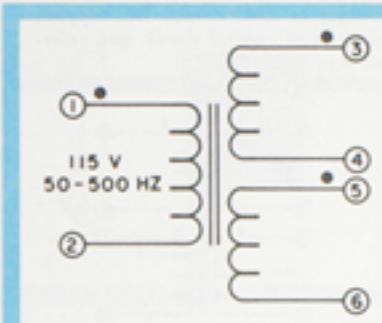
## LOW-VOLTAGE, LOW-CURRENT PLUG-IN PRINTED CIRCUIT TYPES—FOR SMALL DC POWER SUPPLIES

Fig. B



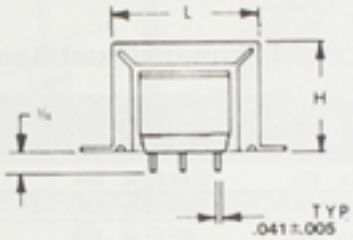



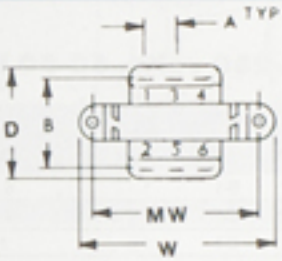

This series of transformers is ideal for single or dual output DC supplies, isolated control circuits and reference supplies in transistorized control and instrumentation. They provide a voltage stepdown and isolation from power line at relatively low power levels of 1½, 4½ and 7 watts at 4 to 58 volts when connected in parallel, and 8 to 116 volts when series connected. Precision spaced plug-in terminals provide fixed mounting centers—the kind usually found only in costly molded units. You get the benefits without the high cost plus maximum power with optimum equipment miniaturization.




Single Primary

Fig. A




F-141XP Series

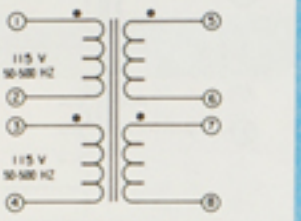
## 115 volts, 50-60 Hz Primary, Dual Secondaries

| Type No. | Fig. | Output Watts | SECONDARY Individual | Series Conn. | Parallel Conn. | Dimensions H. | W. | D. | L. | A. | B. | MW | Wt. Oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-131P | B | 1½ | 4V @ .188A | 8V CT @ .188A | 4V @ .376A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-139P | B | 1½ | 6.3V @ .12A | 12.6V CT @ .12A | 6.3V @ .24A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-132P | B | 1½ | 7.5V @ .10A | 15V CT @ .100A | 7.5V @ .200A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-150P | B | 1½ | 8.5V @ .085A | 17V CT @ .085A | 8.5V @ .170A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-138P | B | 1½ | 12.6V @ .06A | 25.2V CT @ .06A | 12.6V @ .12A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-133P | B | 1½ | 15V @ .05A | 30V CT @ .050A | 15V @ .100A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-160P | B | 1½ | 17V @ .045A | 34V CT @ .045A | 17V @ .090A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-137P | B | 1½ | 20V @ .038A | 40V CT @ .038A | 20V @ .076A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-134P | B | 1½ | 27V @ .028A | 54V CT @ .028A | 27V @ .056A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-135P | B | 1½ | 38V @ .02A | 76V CT @ .020A | 38V @ .040A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-136P | B | 1½ | 58V @ .013A | 116V CT @ .013A | 58V @ .026A | 1⅛ | | 1 5/32 | 1 23/64 | 5/64 | 1 | | 3.5 |
| F-141XP | A | 4½ | 4V @ .562A | 8V CT @ .562A | 4.0V @ 1.124A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-149XP | A | 4½ | 6.3V @ .35A | 12.6V CT @ .35A | 6.3V @ .70A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-142XP | A | 4½ | 7.5V @ .3A | 15V CT @ .300A | 7.5V @ .600A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-161XP | A | 4½ | 8.5V @ .264A | 17V CT @ .264A | 8.5V @ .528A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-148XP | A | 4½ | 12.6V @ .178A | 25.2V CT @ .178A | 12.6V @ .356A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-143XP | A | 4½ | 15V @ .150A | 30V CT @ .150A | 15V @ .300A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-162XP | A | 4½ | 17V @ .132A | 34V CT @ .132A | 17V @ .264A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-147XP | A | 4½ | 20V @ .112A | 40V CT @ .112A | 20V @ .224A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-144XP | A | 4½ | 27V @ .084A | 54V CT @ .084A | 27V @ .168A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-145XP | A | 4½ | 38V @ .06A | 76V CT @ .060A | 38V @ .120A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-146XP | A | 4½ | 58V @ .033A | 116V CT @ .033A | 58V @ .066A | 1 23/64 | 2⅜ | 1¼ | 1 45/64 | 1/32 | 1 1/32 | 2 | 7.5 |
| F-151XP | A | 7½ | 4V @ .94A | 8V CT @ .940A | 4.0V @ 1.88A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-159XP | A | 7½ | 6.3V @ .6A | 12.6V CT @ .60A | 6.3V @ 1.2A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-152XP | A | 7½ | 7.5V @ .5A | 15V CT @ .500A | 7.5V @ 1.000A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-163XP | A | 7½ | 8.5V @ .441A | 17V CT @ .441A | 8.5V @ .882A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-158XP | A | 7½ | 12.6V @ .3A | 25.2V CT @ .30A | 12.6V @ .60A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-153XP | A | 7½ | 15V @ .25A | 30V CT @ .250A | 15V @ .500A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-164XP | A | 7½ | 17V @ .22A | 34V CT @ .220A | 17V @ .440A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-157XP | A | 7½ | 20V @ .188A | 40V CT @ .188A | 20V @ .376A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-154XP | A | 7½ | 27V @ .14A | 54V CT @ .140A | 27V @ .280A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-155XP | A | 7½ | 38V @ .1A | 76V CT @ .100A | 38V @ .200A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |
| F-156XP | A | 7½ | 58V @ .3A | 116V CT @ .300A | 58V @ .130A | 1 41/64 | 2 13/64 | 1 15/32 | 1 45/64 | 1/32 | 1 1/16 | 2⅜ | 10.5 |

# Power Transformers

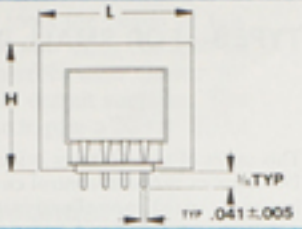
TRIAD-UTRAD
A Division of Magnetek, Inc.

These transformers with dual primaries permit their use in equipment for sale in both foreign and domestic markets. Voltages and currents were chosen particularly for widely-used power applications in semi-conductor circuits such as single or dual output DC supplies and isolated control circuit and reference supplies.



Dual Primary


Fig. B-1



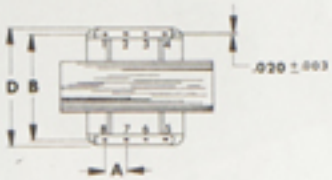
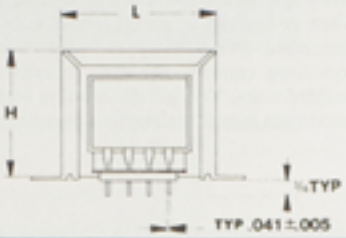
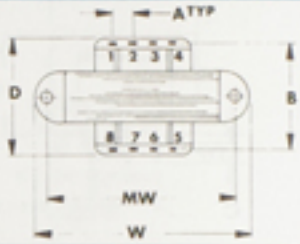





Fig. A-1, A-2

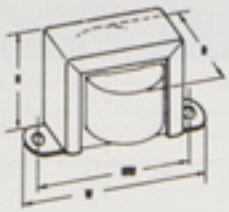



## 115-230 volts, 50-60 Hz Dual Primary/Dual Secondaries

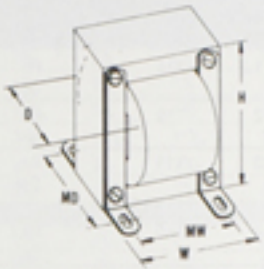
| Type No. | Fig. | Output Watts | SECONDARY Individual | Series Conn. | Parallel Conn. | Dimensions H. | W. | D. | L. | A. | B. | MW | Wt. Oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-3450P | B-1 | 1 | 6.3V @ .07A | 12.6V CT @ .07A | 6.3V @ .14A | 5/16 | - | 1 9/16 | 1 | 13/16 | 1 13/16 | - | 2.5 |
| F-3132P | B-1 | 1 1/2 | 7.5V @ .1A | 15V CT @ .1A | 7.5V @ .2A | 1 1/8 | - | 1 1/8 | 1 1/8 | 13/16 | 1 | - | 4.0 |
| F-333P | B-1 | 1 1/2 | 15V @ .05A | 30V CT @ .50A | 15V @ .100A | 1 1/8 | - | 1 1/8 | - | 13/16 | 1 | - | 4.0 |
| F-367P | B-1 | 1 1/2 | 115V @ .0065A | 230V CT @ .0065A | 115V @ .013A | 1 1/8 | - | 1 1/8 | 1 1/8 | 13/16 | 1 | - | 4.0 |
| F-348XP | A-1 | 4 1/2 | 6.3V @ .35A | 12.6V CT @ .350A | 6.3V @ .700A | 1 1/8 | 2 1/8 | 1 1/4 | 1 1/8 | 1/4 | 1 3/16 | 2 | 6.5 |
| F-3142XP | A-1 | 4 1/2 | 7.5V @ .3A | 15V CT @ .3A | 7.5V @ .6A | 1 1/8 | 2 1/8 | 1 1/4 | 1 1/8 | 1/4 | 1 3/16 | 2 | 6.5 |
| F-349XP | A-1 | 4 1/2 | 8V @ .28A | 16V CT @ .280A | 8V @ .560A | 1 1/8 | 2 1/8 | 1 1/4 | 1 1/8 | 1/4 | 1 3/16 | 2 | 6.5 |
| F-350XP | A-1 | 4 1/2 | 12V @ .18A | 24V CT @ .180A | 12V @ .360A | 1 1/8 | 2 1/8 | 1 1/4 | 1 1/8 | 1/4 | 1 3/16 | 2 | 6.5 |
| F-358XP | A-1 | 4 1/2 | 10V @ .225A | 20V CT @ .225A | 10V @ .450A | 1 1/8 | 2 1/8 | 1 1/4 | 1 1/8 | 1/4 | 1 3/16 | 2 | 6.5 |
| F-3143XP | A-1 | 4 1/2 | 15V @ .15A | 30V CT @ .15A | 15V @ .3A | 1 1/8 | 2 1/8 | 1 1/4 | 1 1/8 | 1/4 | 1 3/16 | 2 | 6.5 |
| F-363XP | A-1 | 4 1/2 | 115V @ .02A | 230V CT @ .020A | 115V @ .040A | 1 1/8 | 2 1/8 | 1 1/4 | 1 1/8 | 1/4 | 1 3/16 | 2 | 6.5 |
| F-3152XP | A-1 | 7 1/2 | 7.5V @ .5A | 15V CT @ .5A | 7.5V @ 1.0A | 1 1/8 | 2 13/16 | 1 1/4 | 1 1/8 | 1/4 | 1 5/16 | 2 1/8 | 11.0 |
| F-3153XP | A-1 | 7 1/2 | 15V @ .25A | 30V CT @ .25A | 15V @ .5A | 1 1/8 | 2 13/16 | 1 1/4 | 1 1/8 | 1/4 | 1 5/16 | 2 1/8 | 11.0 |
| F-368XP | A-1 | 7 1/2 | 115V @ .065A | 230V CT @ .065A | 115V @ .13A | 1 1/8 | 2 13/16 | 1 1/4 | 1 1/8 | 1/4 | 1 5/16 | 2 1/8 | 11.0 |
| F-359XP | A-2 | 10 | 12V @ .45A | 24V CT @ .450A | 12V @ .900A | 1 1/8 | 2 13/16 | 1 1/4 | 1 1/8 | 1/4 | 1 5/16 | 2 1/8 | 11.0 |
| F-362XP | A-2 | 10 | 10V @ .5A | 20V CT @ .500A | 10V @ 1.0A | 1 1/8 | 2 13/16 | 1 1/4 | 1 1/8 | 1/4 | 1 5/16 | 2 1/8 | 11.0 |
| F-365XP | A-2 | 10 | 6.3V @ .8A | 12.6V CT @ .800A | 6.3V @ 1.6A | 1 1/8 | 2 13/16 | 1 1/4 | 1 1/8 | 1/4 | 1 5/16 | 2 1/8 | 11.0 |
| F-366XP | A-2 | 10 | 8V @ .64A | 16V CT @ .640A | 8V @ 1.28A | 1 1/8 | 2 13/16 | 1 1/4 | 1 1/8 | 1/4 | 1 5/16 | 2 1/8 | 11.0 |
| F-369XP | A-2 | 10 | 115V @ .087 | 230V CT @ .087A | 115V @ .174A | 1 1/8 | 2 13/16 | 1 1/4 | 1 1/8 | 1/4 | 1 5/16 | 2 1/8 | 11.0 |
| F-370P | B-1 | 24 | 5V @ 2.4A | 10V CT @ 2.4A | 5V @ 4.8A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |
| F-371P | B-1 | 24 | 6.3V @ 2A | 12.6V CT @ 2A | 6.3V @ 4A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |
| F-372P | B-1 | 24 | 8V @ 1.5A | 16V CT @ 1.5A | 8V @ 3A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |
| F-373P | B-1 | 24 | 10V @ 1.2A | 20V CT @ 1.2A | 10V @ 2.4A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |
| F-374P | B-1 | 24 | 12V @ 1A | 24V CT @ 1A | 12V @ 2A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |
| F-375P | B-1 | 24 | 14V @ .8A | 28V CT @ .8A | 14V @ 1.6A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |
| F-376P | B-1 | 24 | 17V @ .7A | 34V CT @ .7A | 17V @ 1.4A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |
| F-377P | B-1 | 24 | 20V @ .6A | 40V CT @ .6A | 20V @ 1.2A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |
| F-378P | B-1 | 24 | 28V @ .42A | 56V CT @ .42A | 28V @ .84A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |
| F-379P | B-1 | 24 | 60V @ .2A | 120V CT @ .2A | 60V @ .4A | 1 1/8 | - | 2 1/4 | 1 1/8 | 1/4 | 2 3/16 | - | 13.3 |

# for Power Supply, Control and Filament Circuits

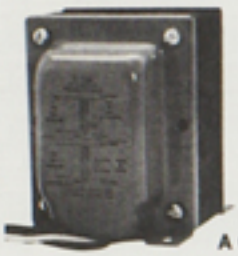


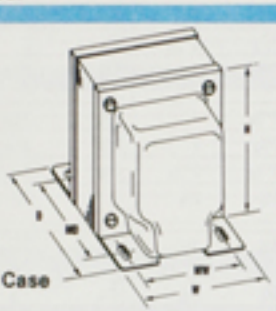
X Case
Most units in case type X also available on special order with shields added or with channel frame removed.

Z Case

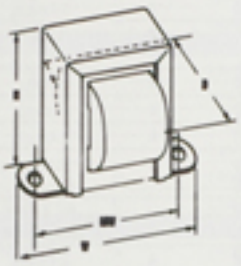


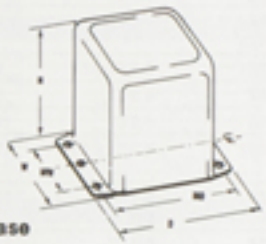
U Case





A Case





K Case

* 60 cycle only

## Single secondary / 50-60 Hz. Listed in order of increasing secondary voltages

| Type No. | Secondary Volts | Secondary Amps | Primary Volts | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-50X# | Sec. 6.3-5<br>Pri. 6.3-5 | 2 | | Pri. 500<br>Sec. 5000 | X | Leads | 1 15/16 | 3 5/16 | 2 | 2 13/16 | | 5/16 | 1.2 |
| Special Fil. Line Matching Transformer | | | | | | | | | | | | | |
| F-1X#<br>F-301X | 2.5 CT | 3 | 115<br>115/230 | 1500 | X | Leads | 1 5/8 | 2 13/16 | 1 5/8 | 2 5/8 | | 5/16 | .68 |
| F-72Z# | 2.5 CT | 5 | 115 | Pri. 1500<br>Sec. 7500 | Z | Pri. Leads<br>Sec. Lugs | 2 29/32 | 3 3/8 | 2 1/8 | 2 13/16 | | 5/16 | 1.7 |
| F-6X#<br>F-306X | 2.5 CT | 6 | 115<br>115/230 | Pri. 1500<br>Sec. 2500 | X | Leads | 1 15/16 | 3 5/16 | 1 5/8 | 2 13/16 | | 5/16 | 1 |
| F-3X# | 2.5 CT | 10 | 115 | Pri. 1500<br>Sec. 3000 | X | Leads | 2 29/32 | 3 5/8 | 2 1/8 | 3 1/8 | | 5/16 | 1.7 |
| F-5U | 2.5 CT | 10 | 115 | Pri. 1500<br>Sec. 7500 | U | Leads | 3 5/16 | 2 1/2 | 2 1/16 | 2 | 1 1/8 | 5/16 × 5/16 | 2.2 |
| F-71U# | 2.5 CT | 10 | 115 | Pri. 1500<br>Sec. 10,000 | U | Pri. Leads<br>Sec. Leads | 3 5/16 | 2 13/16 | 2 5/16 | 2 1/4 | 2 1/8 | 5/16 × 5/16 | 2.6 |
| F-7X | 5 CT | 3 | 115 | 1500 | X | Leads | 1 15/16 | 3 5/16 | 2 | 2 13/16 | | 5/16 | 1.3 |
| F-8X | 5 CT | 6 | 115 | 1500 | X | Leads | 2 29/32 | 3 5/8 | 2 1/8 | 3 1/8 | | 5/16 | 1.7 |
| F-12X | 5 CT | 8 | 115 | 2500 | X | Leads | 2 15/16 | 4 | 2 1/4 | 3 5/16 | | 5/16 | 2.5 |
| F-10U# | 5 CT | 14 | 115 | Pri. 1500<br>Sec. 10,000 | U | Leads | 3 5/16 | 3 5/16 | 3 1/4 | 2 1/2 | 2 5/16 | 5/16 × 5/16 | 4.75 |
| F-15U# | 5 CT | 15 | 115 | Pri. 1500<br>Sec. 3000 | U | Leads<br>Lugs | 3 1/2 | 2 5/8 | 2 11/16 | 2 1/4 | 2 5/16 | 5/16 × 5/16 | 3.25 |
| F-9U | 5.2 CT | 13 | 115 | 1500 | U | Leads | 3 5/16 | 2 13/16 | 3 1/4 | 2 1/4 | 2 5/8 | 5/16 × 5/16 | 4 |
| F-11U | 5.2 CT | 24 | 115 | 1500 | U | Leads | 3 15/16 | 3 5/16 | 3 5/8 | 2 1/2 | 3 1/16 | 5/16 × 5/16 | 6.75 |
| F-13X<br>F-313X | 6.3 | .6 | 115<br>115/230 | 1500 | X | Leads | 1 5/8 | 2 5/8 | 1 5/8 | 2 | | 5/16 | .37 |
| R-84K | 6.3‡ | .6 | 115 | Pri. 1500<br>Sec. 3500 | K | 2 Leads | 2 5/8 | 2 1/4 | 2 11/16 | 1 1/2 | 2 5/8 | 5/16 | 1.5 |
| F-14X#<br>F-314X | 6.3 CT | 1.2 | 115<br>115/230 | Pri. 1500<br>Sec. 2500 | X | Leads | 1 5/8 | 2 13/16 | 1 5/8 | 2 5/8 | | 5/16 | .7 |
| F-14Z# | 6.3 CT | 1.2 | 115 | Pri. 1500<br>Sec. 2500 | Z | Leads | 1 15/16 | 2 5/8 | 1 5/8 | 2 | | 5/16 | .7 |

‡Static shield. †Tapped primary to produce lower voltages. #60 cycle operation

# for Power Supply, Control and Filament Circuits

## Single secondary / 50-60 Hz (Continued)

| Type No. | Secondary Volts | Secondary Amps | Primary Volts | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-52X | 6.3‡ | 1.2 | 115 | Pri. 1500<br>Sec. 5000 | X | Leads | 1 11/16 | 3 9/16 | 1 3/4 | 2 13/16 | | 3/16 | 1 |
| F-51X# | 6.3-5‡ | 2 | 115 | Pri. 1500<br>Sec. 5000 | X | Leads | 1 11/16 | 3 9/16 | 2 | 2 13/16 | | 3/16 | 1.25 |
| F-16X | 6.3 CT | 3 | 115 | Pri. 1500<br>Sec. 2500 | X | Leads | 1 11/16 | 3 9/16 | 2 | 2 13/16 | | 3/16 | 1.3 |
| F-316X | | | 115/230 | | | | | | | | | | |
| F-53X | 6.3 | 4 | 115 | Pri. 1500<br>Sec. 5000 | X | Leads | 2 15/32 | 4 | 2 1/4 | 3 5/16 | | 3/16 | 2.1 |
| F-43X# | 6.3 | 4 | 115 | 1500 | X | Leads | 1 11/16 | 3 9/16 | 2 | 2 13/16 | | 3/16 | 1.25 |
| F-18A | 6.3 CT | 6 | 115 | 1500 | A | 1-Leads | 3 1/16 | 2 11/32 | 2 3/8 | 2 | 1 1/16 | 3/8×3/16 | 2.5 |
| F-18X | 6.3 CT | 6 | 115 | 1500 | X | Leads | 2 15/32 | 4 | 2 1/4 | 3 5/16 | | 3/16 | 2.3 |
| F-318X | | | 115/230 | | | | | | | | | | |
| F-19X† | 6.3 CT-6 CT | 6 | 115 | 2000 | X | Leads | 2 15/32 | 4 | 2 1/4 | 3 5/16 | | 3/16 | 2.3 |
| F-69X | 6.3 CT | 8 | 115 | 1500 | X | Leads | 2 5/16 | 4 | 2 1/4 | 3 5/16 | | 3/16 | 2.3 |
| F-21A | 6.3 CT | 10 | 115 | 1500 | A | 1-Leads | 3 15/32 | 2 11/32 | 3 1/8 | 2 1/4 | 2 | 3/8×3/16 | 3.8 |
| F-20U† | 6.3 CT-6 CT | 11 | 115 | Pri. 1500<br>Sec. 3000 | U | Leads | 3 1/2 | 2 1/8 | 3 | 2 1/4 | 2 1/16 | 3/16×3/16 | 4 |
| F-17U | 6.3 CT<br>Lo-Cap. | 15 | 115 | Pri. 1500<br>Sec. 10,000 | U | Pri. Leads<br>Sec. Leads | 4 1/4 | 3 1/2 | 3 3/4 | 2 3/4 | 2 13/16 | 3/16×3/16 | 7.5 |
| F-22A | 6.3 CT | 20 | 115 | 2000 | A | 2-Leads | 3 1/8 | 3 5/32 | 4 1/8 | 2 1/2 | 3 | 3/8×3/16 | 7 |
| F-24U† | 7.5 CT-<br>6.3 CT | 8 | 115 | Pri. 1500<br>Sec. 3000 | U | Leads | 3 1/2 | 2 1/8 | 2 13/16 | 2 1/4 | 2 1/16 | 3/16×3/16 | 3.65 |
| F-28U† | 7.5 CT-<br>6.3 CT | 25 | 115 | Pri. 1500<br>Sec. 3000 | U | Leads & Lugs | 4 1/8 | 3 13/16 | 3 3/8 | 3 | 3 1/16 | 3/16×3/16 | 7.5 |
| F-180X | 10 CT | 1 | 115 | 1500 | X | Leads | 1 11/16 | 3 9/16 | 1 3/4 | 2 13/16 | | 3/16 | .9 |
| F-31X | 10 CT | 3 | 115 | 2000 | X | Leads | 2 5/32 | 3 3/4 | 2 1/8 | 3 1/8 | | 3/16 | 1.7 |
| F-95X | 10 CT | 4 | 115 | 1500 | X | Leads | 2 5/8 | 4 | 2 1/8 | 3 5/16 | | 3/16 | 2.1 |
| F-33U | 10 CT | 5 | 115 | 2000 | U | Leads | 3 | 2 1/2 | 2 3/8 | 2 | 2 1/16 | 3/8×3/16 | 2.5 |
| F-96U | 10 CT | 6 | 115 | 1500 | U | Leads | 3 | 2 1/2 | 2 1/4 | 2 | 2 5/16 | 3/8×3/16 | 2.1 |
| F-23U | 10 CT | 7 | 115 | 1500 | U | Leads | 3 1/2 | 2 5/8 | 2 13/16 | 2 1/4 | 2 5/16 | 3/16×3/16 | 3.9 |
| F-97U | 10 CT | 8 | 115 | 1500 | U | Leads | 3 5/16 | 2 13/16 | 3 | 2 1/4 | 2 1/2 | 3/8×3/16 | 4.0 |
| F-35U | 10 CT | 10 | 115 | 2000 | U | Leads | 4 1/8 | 3 13/16 | 3 1/4 | 2 3/4 | 2 5/16 | 3/8×3/16 | 9.1 |
| F-113X | 12 | 0.15 | 115 | 1500 | X | Leads | 1 3/8 | 2 3/8 | 1 3/8 | 2 | | 3/16 | .4 |
| F-216X# | 12 | .35 | 115 | 1500 | X | Leads | 1 3/8 | 2 3/8 | 1 3/8 | 2 | | 3/16 | .37 |
| F-114X | 12 | 0.7 | 115 | 1500 | X | Leads | 1 3/8 | 2 13/16 | 1 3/8 | 2 3/8 | | 3/16 | .8 |
| F-217X# | 12 | 1.2 | 115 | 1500 | X | Leads | 2 | 3 1/4 | 1 3/8 | 2 13/16 | | 3/16 | 1.0 |
| F-218X# | 12 | 2 | 115 | 1500 | X | Leads | 2 | 3 1/4 | 1 3/8 | 2 3/8 | | 3/16 | 1.13 |
| F-219X# | 12 | 4 | 115 | 1500 | X | Leads | 2 5/16 | 4 | 2 1/4 | 3 5/16 | | 3/16 | 2.3 |
| F-220U# | 12 | 6 | 115 | 1500 | U | Leads | 3 1/16 | 2 13/16 | 2 1/2 | 2 1/4 | 2 3/8 | 3/8×3/16 | 3.5 |
| F-221U# | 12 | 8 | 115 | 1500 | U | Leads | 3 13/16 | 3 1/8 | 2 3/8 | 2 1/2 | 2 3/8 | 3/8×3/16 | 4.0 |
| F-29U† | 12 CT-11 CT<br>10 CT | 11 | 115 | Pri. 1500<br>Sec. 3000 | U | Leads | 4 1/8 | 3 1/2 | 3 3/8 | 2 3/4 | 2 5/16 | 3/16×3/16 | 6.5 |
| F-70X | 12.6 CT | 1.0 | 115 | 1500 | X | Leads | 1 11/16 | 3 9/16 | 1 3/4 | 2 13/16 | | 3/16 | 1.3 |
| F-25X | 12.6 CT | 1.5 | 115 | 1500 | X | Leads | 1 11/16 | 3 9/16 | 2 | 2 13/16 | | 3/16 | 1.3 |
| F-325X | | | 115/230 | | | | | | | | | | |
| F-44X# | 12.6 CT | 2 | 115 | 1500 | X | Leads | 1 11/16 | 3 9/16 | 2 | 2 13/16 | | 3/16 | 1.25 |
| F-344X | | | 115/230 | | | | | | | | | | |
| F-26X# | 12.6 CT | 2.5 | 115 | 1500 | X | Leads | 2 5/32 | 3 1/16 | 2 | 3 1/8 | | 3/16 | 1.55 |
| F-326X | | | 115/230 | | | | | | | | | | |
| F-224X# | 12.6 | 3 | 115 | 1500 | X | Leads | 2 1/4 | 3 3/4 | 2 1/8 | 3 1/8 | | 3/16 | 1.6 |
| F-225X# | 12.6 | 4 | 115 | 1500 | X | Leads | 2 5/8 | 4 | 2 1/16 | 3 5/16 | | 3/16 | 2.3 |
| F-181U | 12.6 CT | 4 | 115 | 1500 | U | Leads | 3 1/16 | 2 5/16 | 2 5/16 | 2 | 2 | 3/16 | 2.3 |
| F-3181U | | | 115/230 | | | | | | | | | | |
| F-182U | 12.6 CT | 6 | 115 | 1500 | U | Leads | 3 1/8 | 2 13/16 | 2 5/16 | 2 1/4 | 2 3/8 | 3/16×3/16 | 3.8 |
| F-183U | 12.6 CT | 8 | 115 | 1500 | U | Leads | 3 13/16 | 3 9/16 | 2 13/16 | 2 1/2 | 2 1/4 | 3/16×3/16 | 5 |

‡Static shield. †Tapped primary to produce lower voltages. #60 cycle operation

# for Power Supply, Control and Filament Circuits

## Single secondary / 50-60 Hz (Continued)

| Type No. | Secondary Volts | Secondary Amps | Primary Volts | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-112X | 14 CT | 0.25 | 115 | 1500 | X | Leads | 1 3/8 | 2 5/8 | 1 3/8 | 2 | | 7/16 | .4 |
| F-3112X | 14 CT | 0.25 | 115/230 | 1500 | X | Leads | 1 3/8 | 2 5/8 | 1 1/2 | 2 | | 7/16 | .3 |
| F-250X | 14 CT | 1 | 115 | 1500 | X | Leads | 1 11/16 | 3 1/4 | 1 3/4 | 2 13/16 | | 7/16 | 1.2 |
| F-251X | 14 CT | 2 | 115 | 1500 | X | Leads | 2 1/4 | 3 11/16 | 1 11/16 | 3 1/8 | | 7/16 | 1.5 |
| F-252U | 14 CT | 4 | 115 | 1500 | U | Leads | 3 | 2 1/2 | 2 1/16 | 2 | 2 1/4 | 9/16×9/16 | 3 |
| F-253U | 14 CT | 6 | 115 | 1500 | U | Leads | 3 3/8 | 2 13/16 | 2 1/8 | 2 1/4 | 2 3/8 | 9/16×9/16 | 4 |
| F-410X | 18 CT | .75 | 115 | 1500 | X | Leads | 1 11/16 | 3 5/16 | 2 | 2 13/16 | | 7/16 | 1.3 |
| F-411X | 18 CT | 1 | 115 | 1500 | X | Leads | 1 11/16 | 3 5/16 | 2 1/8 | 2 13/16 | | 7/16 | 1.45 |
| F-412X | 18 CT | 1.5 | 115 | 1500 | X | Leads | 2 5/32 | 3 3/4 | 2 1/8 | 3 1/8 | | 7/16 | 1.7 |
| F413X | 18 CT | 2 | 115 | 1500 | X | Leads | 2 5/32 | 3 3/4 | 2 1/4 | 3 1/8 | | 7/16 | 1.95 |
| F-254X | 20 CT | 1 | 115 | 1500 | X | Leads | 2 1/4 | 3 11/16 | 1 11/16 | 3 1/8 | | 7/16 | 1.5 |
| F-255X | 20 CT | 2 | 115 | 1500 | X | Leads | 2 5/16 | 4 | 2 1/4 | 3 5/16 | | 7/16 | 2.5 |
| F-256U | 20 CT | 4 | 115 | 1500 | U | Leads | 3 3/8 | 2 13/16 | 2 1/8 | 2 1/4 | 2 3/8 | 9/16×9/16 | 4 |
| F-257U | 20 CT | 6 | 115 | 1500 | U | Leads | 3 3/8 | 3 1/8 | 3 1/8 | 2 1/2 | 2 3/8 | 9/16×9/16 | 5.7 |
| F-258U | 20 CT | 8 | 115 | 1500 | U | Leads | 3 3/8 | 3 1/8 | 3 1/2 | 2 1/2 | 2 3/8 | 9/16×9/16 | 6.4 |
| F-259U | 20 CT | 10 | 115 | 1500 | U | Leads | 4 1/8 | 3 5/16 | 3 1/2 | 2 3/4 | 2 3/8 | 9/16×9/16 | 7.4 |
| F-115X<br>F-3115X | 24 CT | 0.085 | 115<br>115/230 | 1500 | X | Leads | 1 5/16 | 2 1/16 | 1 3/8 | 1 3/4 | | 7/16 | .3 |
| F-116X<br>F-3116X | 24 CT | 0.2 | 115<br>115/230 | 1500 | X | Leads | 1 3/8 | 2 5/8 | 1 1/2 | 2 | | 7/16 | .45 |
| F-117X | 24 CT | 0.4 | 115 | 1500 | X | Leads | 1 3/8 | 2 13/16 | 1 3/8 | 2 5/8 | | 7/16 | .8 |
| F-3117X | 24 CT | .4 | 115/230 | 1500 | X | Leads | 1 3/8 | 2 13/16 | 1 1/2 | 2 5/8 | | 7/16 | .75 |
| F-246X# | 24 CT | .5 | 440 | 1500 | X | Leads | 2 | 3 1/4 | 1 3/8 | 2 13/16 | | 7/16 | .8 |
| F-118X<br>F-3118X | 24 CT | .7 | 115<br>115/230 | 1500 | X | Leads | 2 | 3 1/4 | 2 | 2 13/16 | | 7/16 | 1.3 |
| F-45X#<br>F-345X | 24 CT | 1 | 115<br>115/230 | 1500 | X | Leads | 1 11/16 | 3 5/16 | 2 | 2 13/16 | | 7/16 | 1.3 |
| F-238X | 24 CT | 1 | 440 | 2000 | X | Leads | 2 1/4 | 3 11/16 | 1 11/16 | 3 1/8 | | 7/16 | 1.7 |
| F-46X#<br>F-346X | 24 | 1 | 115<br>115/230 | 1500 | X | Leads | 1 11/16 | 3 1/4 | 2 1/8 | 2 13/16 | | 7/16 | 1.4 |
| F-229X# | 24 | 2 | 115 | 1500 | X | Leads | 2 5/16 | 4 | 2 | 3 5/16 | | 7/16 | 2.3 |
| F-192X | 24 CT | 2 | 115 | 1500 | X | Leads | 2 5/32 | 4 | 2 1/4 | 3 5/16 | | 7/16 | 2.3 |
| F-231X | 24 CT | 2 | 440 | 2000 | X | Leads | 2 5/16 | 4 | 2 1/4 | 3 5/16 | | 7/16 | 2.4 |
| F-193U | 24 CT | 4 | 115 | 1500 | U | Leads | 3 1/16 | 3 1/8 | 2 13/16 | 2 1/2 | 2 1/8 | 9/16×9/16 | 4 |
| F-232U | 24 CT | 4 | 440 | 2000 | U | Leads | 3 3/8 | 3 1/8 | 2 1/8 | 2 1/2 | 2 1/4 | 9/16×9/16 | 4.6 |
| F-260U | 24 CT | 6 | 115 | 1500 | U | Leads | 3 3/8 | 3 1/8 | 3 1/2 | 2 1/2 | 2 3/8 | 9/16×9/16 | 6.4 |
| F-261U | 24 CT | 8 | 115 | 1500 | U | Leads | 4 1/8 | 3 5/16 | 3 1/2 | 2 3/4 | 2 3/4 | 9/16×9/16 | 7.4 |
| F-401U | 24 CT | 10 | 115 | 1500 | U | Leads | 4 1/8 | 3 5/16 | 3 3/4 | 2 3/4 | 3 | 3/8×9/16 | 8.0 |
| F-226U# | 24 CT | 12 | 115 | 1500 | U | Leads | 4 5/16 | 3 3/4 | 4 1/8 | 3 | 3 1/4 | 3/8×9/16 | 10.4 |
| F-57X<br>F-357X | 25.2 CT | 1 | 115<br>115/230 | 1500 | X | Leads | 1 11/16 | 3 5/16 | 2 | 2 13/16 | | 7/16 | 1.5 |
| F-41X#<br>F-341X | 25.2 CT | 2 | 115<br>115/230 | 1500 | X | Leads | 2 5/32 | 4 | 2 1/4 | 3 5/16 | | 7/16 | 2.2 |
| F-56X | 25.2 CT | 2.8 | 115 | 1500 | X | Leads | 2 5/32 | 4 | 2 1/4 | 3 5/16 | | 7/16 | 2.5 |
| F-119X | 26.8 CT | 0.15 | 115 | 1500 | X | Leads | 1 3/8 | 2 5/8 | 1 1/2 | 2 | | 7/16 | .45 |
| F-120X | 26.8 CT | 0.5 | 115 | 1500 | X | Leads | 1 11/16 | 3 1/4 | 2 | 2 13/16 | | 7/16 | 1.3 |
| F-40X#<br>F-340X | 26.8 CT | 1 | 115<br>115/230 | 1500 | X | Leads | 1 11/16 | 3 5/16 | 2 | 2 13/16 | | 7/16 | 1.3 |
| F-55X<br>F-355X | 26.8 CT | 1.7 | 115<br>115/230 | 1500 | X | Leads | 2 5/32 | 4 | 2 1/4 | 3 5/16 | | 7/16 | 2.3 |
| F-121X | 28 CT | .085 | 115 | 1500 | X | Leads | 1 5/16 | 2 1/16 | 1 3/8 | 1 3/4 | | 7/16 | .25 |
| F-122X | 28 CT | .175 | 115 | 1500 | X | Leads | 1 3/8 | 2 5/8 | 1 1/2 | 2 | | 7/16 | .35 |
| F-123X | 28 CT | .300 | 115 | 1500 | X | Leads | 1 3/8 | 2 13/16 | 1 3/8 | 2 5/8 | | 7/16 | .60 |
| F-124X | 28 CT | .800 | 115 | 1500 | X | Leads | 1 11/16 | 3 1/4 | 2 | 2 13/16 | | 7/16 | 1.00 |
| F-184X | 28.0 CT | 1 | 115 | 1500 | X | Leads | 2 5/16 | 3 11/16 | 2 1/4 | 3 1/8 | | 7/16 | 1.4 |
| F-185U<br>F-3185U | 28.0 CT | 2 | 115<br>115/230 | 1500 | U | Leads | 3 1/16 | 2 1/2 | 2 1/16 | 2 | 2 1/4 | 9/16×9/16 | 2.9 |
| F-187U | 28.0 CT | 4 | 115 | 1500 | U | Leads | 3 1/2 | 2 5/8 | 3 1/16 | 2 1/4 | 2 3/4 | 9/16×9/16 | 5.3 |

#60 cycle operation.

# Power Transformers

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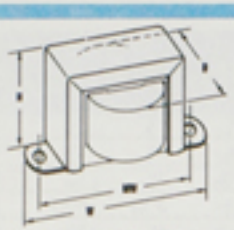
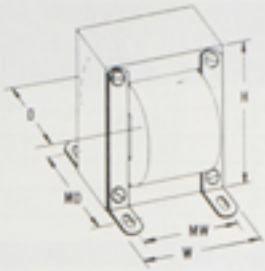
## for Power Supply, Control and Filament Circuits

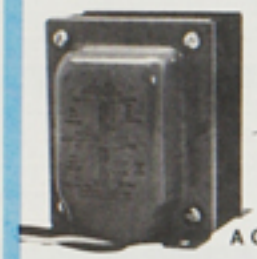


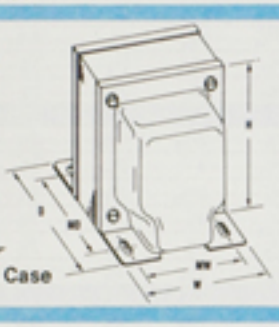
X Case
Most units in case type X also available on special order with shields added or with channel frame removed.

Z Case

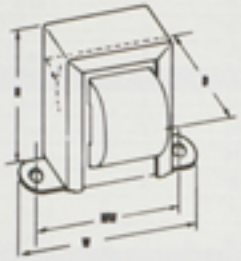


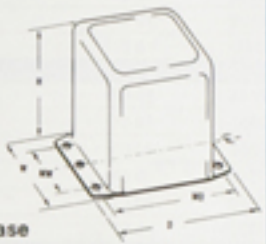
U Case





A Case





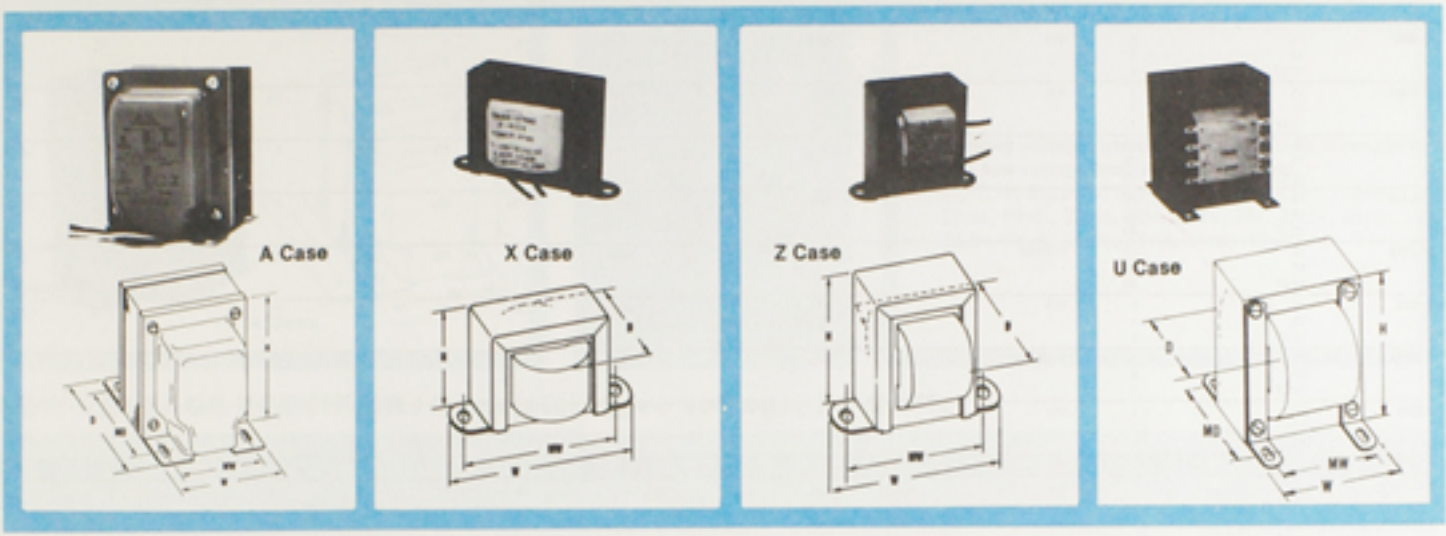
K Case

### Single secondary / 50-60 Hz. Listed in order of increasing secondary voltages

| Type No. | Secondary Volts | Secondary Amps | Primary Volts | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-262X | 30.0 CT | 1 | 115 | 1500 | X | Leads | 2¼ | 3 1/16 | 1 13/16 | 3⅛ | | ¼ | 1.5 |
| F-210X | 30.0 CT | 1.7 | 115 | 1500 | X | Leads | 2 15/32 | 4 | 2¼ | 3 5/16 | | ¼ | 2.3 |
| F-263U | 30.0 CT | 2 | 115 | 1500 | U | Leads | 3 | 2½ | 2 5/16 | 2 | 2⅜ | ¼×⅜ | 3.2 |
| F-264U | 30.0 CT | 4 | 115 | 1500 | U | Leads | 3¾ | 3⅛ | 3⅛ | 2½ | 2⅝ | ¼×⅜ | 5.7 |
| F-265U | 30.0 CT | 6 | 115 | 1500 | U | Leads | 4⅛ | 3 7/16 | 3½ | 2⅝ | 2¾ | ¼×⅜ | 7.4 |
| F-266U | 30.0 CT | 8 | 115 | 1500 | U | Leads | 4½ | 3¾ | 4 | 3 | 3 | ¼×⅜ | 10.0 |
| F-227X# | 35 CT | .065 | 115 | 1500 | X | Leads | 1 5/16 | 2 1/16 | 1 1/16 | 1⅝ | | ¼ | .3 |
| F-188X | 35.0 CT | .1 | 115 | 1500 | X | Leads | 1⅝ | 2 3/16 | 1 1/16 | 2⅜ | | ¼ | .35 |
| F-228X# | 35 CT | .3 | 115 | 1500 | X | Leads | 1⅝ | 2 3/16 | 1⅜ | 2⅜ | | ¼ | .6 |
| F-189X | 35.0 CT | .5 | 115 | 1500 | X | Leads | 2 1/16 | 3 1/16 | 1 13/16 | 3⅛ | | ¼ | 1.0 |
| F-54X F-354X | 35 CT | 1.5 | 115 115/230 | 1500 | X | Leads | 2 15/32 | 4 | 2¼ | 3 5/16 | | ¼ | 2.2 |
| F-190U | 35.0 CT | 2 | 115 | 1500 | U | Leads | 3⅜ | 2 3/16 | 2⅜ | 2⅛ | 2⅜ | ¼×⅜ | 3.5 |
| F-191U | 35.0 CT | 4 | 115 | 1500 | U | Leads | 3 3/16 | 3 1/16 | 3 1/16 | 2⅜ | 2½ | ¼×⅜ | 6.0 |
| F-267U | 35.0 CT | 6 | 115 | 1500 | U | Leads | 4⅛ | 3 7/16 | 3½ | 2⅝ | 2¾ | ¼×⅜ | 7.4 |
| F-268U | 35.0 CT | 8 | 115 | 1500 | U | Leads | 4½ | 3⅝ | 4⅛ | 3 | 3⅛ | ¼×⅜ | 11.0 |
| F-269U | 35.0 CT | 10 | 115 | 1500 | U | Leads | 5⅛ | 4⅜ | 4⅛ | 3½ | 2¾ | ⅜×13/16 | 12.0 |
| F-270X | 40.0 CT | 1 | 115 | 1500 | X | Leads | 2 5/16 | 4 | 2¼ | 3 5/16 | | ¼ | 2.6 |
| F-271U | 40.0 CT | 2 | 115 | 1500 | U | Leads | 3⅜ | 2 3/16 | 2⅜ | 2⅛ | 2⅜ | ¼×⅜ | 4.0 |
| F-272U | 40.0 CT | 4 | 115 | 1500 | U | Leads | 3¾ | 3⅛ | 3½ | 2½ | 2⅜ | ¼×⅜ | 6.4 |
| F-273U | 40.0 CT | 6 | 115 | 1500 | U | Leads | 4½ | 3¾ | 4 | 3 | 3 | ¼×⅜ | 10.0 |
| F-274U | 40.0 CT | 8 | 115 | 1500 | U | Leads | 4½ | 3¾ | 4⅛ | 3 | 3⅜ | ¼×⅜ | 10.5 |
| F-275U | 40.0 CT | 10 | 115 | 1500 | U | Leads | 5⅜ | 4⅜ | 4½ | 3½ | 3¼ | ⅜×13/16 | 14.5 |
| F-276X | 50.0 CT | 1 | 115 | 1500 | X | Leads | 2 5/16 | 4 | 2¼ | 3 5/16 | | ¼ | 2.4 |
| F-277U | 50.0 CT | 2 | 115 | 1500 | U | Leads | 3¾ | 3⅛ | 2⅜ | 2½ | 2⅜ | ¼×⅜ | 4.7 |
| F-278U | 50.0 CT | 4 | 115 | 1500 | U | Leads | 4⅛ | 3 7/16 | 3½ | 2⅝ | 2¾ | ¼×⅜ | 7.4 |
| F-58A | 50 CT | 5 | 115 | 1500 | A | Leads | 4⅝ | 3 1/16 | 4½ | 3 | 3⅜ | ⅜×⅜ | 10.0 |
| F-59X | 60 CT | .4 | 115 | 1500 | X | Leads | 1 1/16 | 3 5/16 | 2 | 2 13/16 | | ¼ | 1.3 |
| F-279U | 60.0 CT | 1 | 115 | 1500 | U | Leads | 3 | 2½ | 2⅜ | 2 | 2⅜ | ¼×⅜ | 3.4 |
| F-280U | 60.0 CT | 2 | 115 | 1500 | U | Leads | 3¾ | 3⅛ | 3⅛ | 2½ | 2⅜ | ¼×⅜ | 5.6 |
| F-281U | 60.0 CT | 4 | 115 | 1500 | U | Leads | 4½ | 3¾ | 4 | 3 | 3 | ¼×⅜ | 10.0 |
| F-282U | 60.0 CT | 6 | 115 | 1500 | U | Leads | 5¼ | 4⅜ | 4⅛ | 3½ | 2⅜ | ¼×⅜ | 12.5 |
| F-283U | 70.0 CT | 1 | 115 | 1500 | U | Leads | 3⅜ | 2 3/16 | 2⅜ | 2⅛ | 2⅛ | ¼×⅜ | 4.0 |
| F-284U | 70.0 CT | 2 | 115 | 1500 | U | Leads | 3¾ | 3⅛ | 3½ | 2½ | 2⅜ | ¼×⅜ | 6.0 |

#60 cycle operation.

# for Power Supply, Control and Filament Circuits




## Multiple secondary / 50-60 Hz

| Type No. | Secondary Volts | Secondary Amps | Primary Volts | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-27U | 10 CT<br>2.5 CT | 10<br>10 | 115 | 1500<br>7500 | U | Leads | 4⅛ | 3½ | 3¾ | 2¾ | 2⅝ | ⅛×⅜ | 6.2 |
| F-32A | 6.3 CT*<br>6.3 CT* | 3<br>3 | 115 | 1500 | A | 1-Leads | 3⅜ | 2 11/32 | 2⅝ | 2 | 1 11/16 | ⅜×⅜ | 2.5 |
| F-34A | 6.3 CT*<br>6.3*<br>6.3*<br>6.3* | 1.75<br>1.75<br>1.75<br>1.75 | 115 | 1500 | A | 2-Leads | 3⅜ | 2 11/32 | 3 | 2 | 2⅛ | ⅜×⅜ | 3.3 |
| F-36A | 6.3 CT*<br>6.3*<br>6.3*<br>6.3* | 3.5<br>3.5<br>3.5<br>3.5 | 115 | 1500 | A | 1-Leads | 3⅛ | 3 5/32 | 3⅛ | 2⅛ | 2⅝ | ⅜×⅜ | 5 |
| F-38A | 6.3 CT*<br>6.3*<br>6.3<br>5 CT<br>5 | 5<br>5<br>1<br>2<br>4 | 115 | 1500 | A | 2-Leads | 3⅛ | 3 5/32 | 3¼ | 2⅛ | 2⅝ | ⅜×⅜ | 6 |
| F-233Z | 6*<br>6* | 2<br>2 | 96 | 1500 | Z | Lugs | 2 13/16 | 3⅛ | 2 | 2 13/16 | | ⅜ | 1.5 |
| F-234Z# | 12 CT<br>12 CT | .1<br>.1 | 115 | 1500 | Z | Lugs | 1⅜ | 2 | 1 13/16 | 1⅝ | | ⅜ | .3 |
| F-235Z# | 12 CT<br>12 CT | .25<br>.25 | 115 | 1500 | Z | Lugs | 2 | 2⅜ | 1 13/16 | 2 | | ⅜ | .6 |
| F-236Z# | 12 CT<br>12 CT | .5<br>.5 | 115 | 1500 | Z | Lugs | 2 13/16 | 2⅛ | 1⅝ | 2⅜ | | ⅜ | .9 |
| F-237Z# | 12 CT<br>12 CT | 1<br>1 | 115 | 1500 | Z | Lugs | 2⅜ | 2 13/16 | 2 13/16 | 2⅜ | | ⅜ | 1.1 |
| F-238U# | 12 CT<br>12 CT | 2<br>2 | 115 | 1500 | U | Lugs | 2½ | 3 | 2 13/16 | 2½ | 2 | ⅜×⅜ | 2.2 |
| F-239U# | 12 CT<br>12 CT | 4<br>4 | 115 | 1500 | U | Lugs | 3⅛ | 3¾ | 2⅝ | 3⅛ | 2¼ | ⅜×⅜ | 4.25 |
| F-240U# | 12 CT<br>12 CT | 6<br>6 | 115 | 1500 | U | Lugs | 3½ | 4⅛ | 3 13/16 | 3 13/16 | 2¼ | ⅜×⅜ | 5.4 |
| F-293X# | 12<br>12 | .5<br>.5 | 277 | Pri. Sec. 2500<br>Sec. Core 1500 | X | Leads | 2 | 3¼ | 1 13/16 | 2 13/16 | | ⅜ | .8 |
| F-294X | 12<br>12 | 1<br>1 | 277 | 1500 | X | Leads | 2 | 3¼ | 2 | 2 13/16 | | ⅜ | 1.2 |
| F-42A | 12.6 CT*<br>12.6* | 2.5<br>2.5 | 115 | 1500 | A | 1-Leads | 3 15/32 | 2 11/32 | 3⅛ | 2¼ | 2 | ⅜×⅜ | 3.7 |
| F-83A# ¶ | 12.6 CT*<br>12.6 CT* | 5<br>5 | 115 | Pri. Sec. 1500<br>Sec. core 2500 | A | 2-Leads | 3⅜ | 3 5/32 | 3⅜ | 2½ | 2⅝ | ⅜×⅜ | 6 |

*Windings may be connected in series to obtain their combined voltage when properly phased: Current will be equal to the current of the lowest winding. Example: Two 6.3V windings @ 2A. in series would be 12.6V. @ 2A. Windings may also be connected in parallel to obtain combined current. Example: Two 6.3V. windings @ 2A. in parallel would be 6.3V. @ 4A.

#60 cycle operation ¶ Tapped primary 105-115-125

# Power Transformers

TRIAD-UTRAD
A Division of Magnetek Inc.

| Type No. | Secondary Volts | Secondary Amps | Primary Volts | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-295Z | 15<br>12<br>12 CT | .1<br>.1<br>.1 | 115 | 1500 | Z | Leads | 1⅝ | 2 | 1⅛ | 1⅝ | | ⅛ | .4 |
| F-329SZ | 15<br>12<br>12 CT | .1<br>.1<br>.1 | 230 | 1500 | Z | Leads | 1⅝ | 2 | 1⅛ | 1⅝ | | ⅛ | .41 |
| F-296Z# | 15<br>12<br>12 CT | .15<br>.15<br>.15 | 115 | 1500 | Z | Leads | 1 13/16 | 2⅜ | 1⅛ | 2 | | ⅛ | .6 |
| F-297Z# | 15<br>12<br>12 CT | .25<br>.25<br>.25 | 115 | 1500 | Z | Leads | 1 13/16 | 2 5/16 | 1⅛ | 2 | | ⅛ | .7 |
| F-329TZ | 15<br>12<br>12 CT | .25<br>.25<br>.25 | 115/230 | 1500 | Z | Leads | 2⅛ | 2⅜ | 1⅛ | 2⅛ | | ⅛ | .8 |
| F-298Z | 15<br>12<br>12 CT | .5<br>.5<br>.5 | 115 | 1500 | Z | Leads | 2⅛ | 3⅜ | 1⅛ | 2⅛ | | ⅛ | 1.25 |
| F-329ZZ | 15<br>12<br>12 CT | .5<br>.5<br>.5 | 115/230 | 1500 | Z | Leads | 2⅛ | 2 13/16 | 2 | 2⅛ | | ⅛ | 1.25 |
| F-299X | 15<br>12<br>12 CT | 1.5<br>1.5<br>1.5 | 115 | 1500 | X | Leads | 2 9/16 | 4 | 2⅛ | 3 9/16 | | ⅛ | 2.3 |
| F-241U#* | 18 CT<br>18 CT | 1<br>1 | 115 | 1500 | U | Lugs | 2⅛ | 3 | 2⅛ | 2⅛ | 2 | ⅜×⅝ | 2.2 |
| F-242U#* | 18 CT<br>18 CT | 2<br>2 | 115 | 1500 | U | Lugs | 3⅛ | 3⅝ | 2 13/16 | 3⅛ | 2⅛ | ⅜×⅝ | 4.0 |
| F-243U#* | 18 CT<br>18 CT | 4<br>4 | 115 | 1500 | U | Lugs | 3⅛ | 4⅛ | 3⅝ | 3 1/16 | 2⅛ | ⅜×⅝ | 5.2 |
| F-244U#* | 18 CT<br>18 CT | 8<br>8 | 115 | 1500 | U | Lugs | 3⅝ | 4⅛ | 4 | 3⅝ | 2⅝ | ⅜×⅝ | 8.3 |
| F-245U#* | 18 CT<br>18 CT | 12<br>12 | 115 | 1500 | U | Lugs | 4⅛ | 5 1/16 | 4⅛ | 4⅛ | 2⅝ | ⅜×⅝ | 11.9 |
| F-194X | 32.0 CT<br>15.5 CT | .050<br>.20 | 115 | 1500 | X | Leads | 1⅝ | 2⅜ | 1⅛ | 2⅛ | | ⅛ | .45 |
| F-195X | 32.0 CT<br>15.5 CT | .250<br>.750 | 115 | 1500 | X | Leads | 2⅛ | 3⅜ | 1⅛ | 3⅛ | | ⅛ | 1.3 |
| F-395X | 32 CT<br>15 CT | .250<br>.750 | 230 | 1500 | X | Leads | 2⅛ | 3⅜ | 1⅛ | 3⅛ | | ⅛ | 1.3 |
| F-196U | 32.0 CT<br>15.0 CT | 1<br>2 | 115 | 1500 | U | Leads | 3⅜ | 2 5/16 | 2⅜ | 2⅛ | 2⅛ | ⅛×⅜ | 4.0 |
| F-396U | 32 CT<br>15 CT | 1<br>2 | 230 | 1500 | U | Leads | 3⅜ | 2 5/16 | 2⅜ | 2⅛ | 2⅛ | ⅛×⅜ | 4.0 |
| F-197U | 32.0 CT<br>15.0 CT | 1<br>4 | 115 | 1500 | U | Leads | 3⅜ | 3⅛ | 2 5/16 | 2⅛ | 2⅛ | ⅛×⅜ | 4.7 |
| F-397U | 32 CT<br>15 CT | 1<br>4 | 230 | 1500 | U | Leads | 3⅜ | 3⅛ | 2 5/16 | 2⅛ | 2⅛ | ⅛×⅜ | 4.7 |
| F-198U | 32.0 CT<br>15.0 CT | 1<br>6 | 115 | 1500 | U | Leads | 3⅜ | 3⅛ | 3 1/16 | 2⅛ | 2⅛ | ⅛×⅜ | 6.2 |
| F-199U | 32.0 CT<br>15.0 CT | 1<br>10 | 115 | 1500 | U | Leads | 4⅛ | 3 1/16 | 3⅛ | 2⅝ | 2⅝ | ⅛×⅜ | 7.4 |

## 115 volts, 50-60 Hz Primary / Triple Output Secondaries for ± 15V and + 5V DC

| TYPE No. | Fig. | Output Watts | Secondary #1 | Secondary #2 | Dimensions H. | W. | D. | L. | A. | B. | MW | Wt. Oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-165P | C-1 | 1½ | 24V CT @ .025A | 9V CT @ .100A | 1⅛ | 1 7/16 | 1½ | 1 7/16 | ⅜ | 1 | | 3.5 |
| F-167P | C-1 | 1½ | 32V CT @ .020A | 15V CT @ .060A | 1⅛ | 1 7/16 | 1½ | 1 7/16 | ⅜ | 1 | | 3.5 |
| F-168EP | D-1 | 4½ | 32V CT @ .050A | 15V CT @ .195A | 1 7/16 | 2⅛ | 1⅛ | 1 7/16 | ½ | 1 5/16 | 2 | 7.5 |
| F-166EP | D-1 | 7½ | 24V CT @ .125A | 9V CT @ .500A | 1 7/16 | 2 5/16 | 1 5/16 | 1 7/16 | ½ | 1 5/16 | 2⅝ | 10.5 |
| F-169EP | D-1 | 7½ | 32V CT @ .100A | 15V CT @ .287A | 1 7/16 | 2 5/16 | 1 5/16 | 1 7/16 | ½ | 1 5/16 | 2⅝ | 10.5 |

Fig. C-1

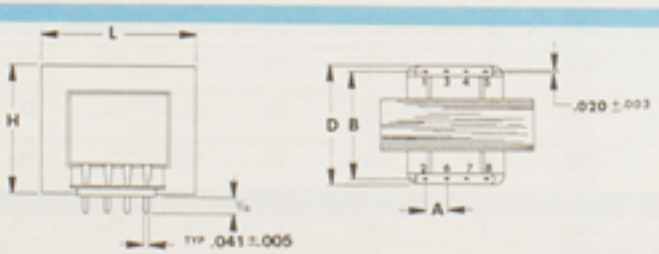
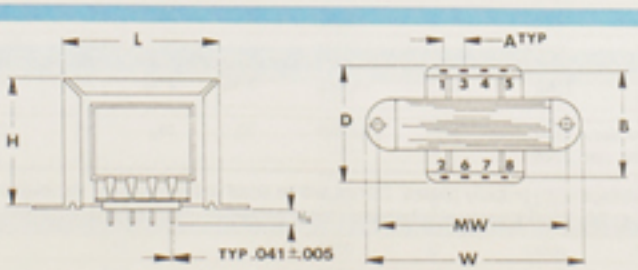
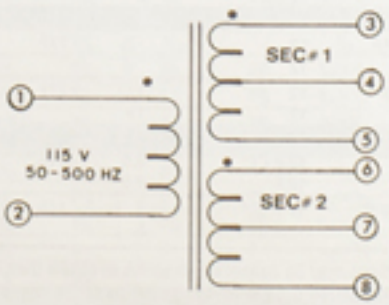


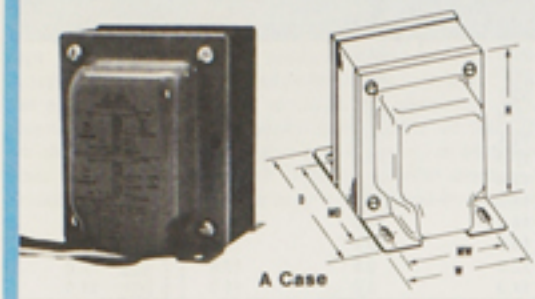

Fig. D-1

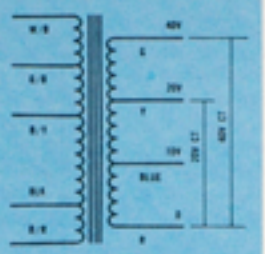



Dual Tapped Secondaries

# for Power Supply, Control and Rectifier Circuits




**Secondary voltages obtainable from F-94X through F-92A low voltage rectifier transformers:**
7v, 7.5v, 8v, 8.5v, 9.5v, 10v, 14vct, 15vct, 16vct, 17vct, 19vct, 20vct, 21v, 22.5v, 24v, 25.5v, 28vct, 28.5v, 30vct, 32vct, 34vct, 38vct, 40vct.

## LOW VOLTAGE RECTIFIER / transistor drive voltage, 50-60 Hz

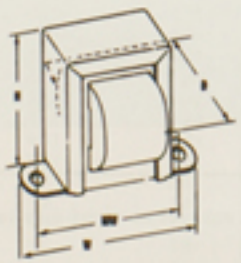
| Type No. | Primary Volts | Secondary AC | | DC Volts Half Wave | DC Volts FW Bridge | RMS Test Voltage | Case Type | Connections | Case Dimension H | W | D | Mounting Dimension MW | MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AC Volts | DC Amps* | | | | | | | | | | | | |
| F-94X<br>F-394X | 115†<br>230† | 10-20 CT-40 CT | .035 | 15 | 30 | 1500 | X | Leads | 1⅜ | 2⅜ | 1⅜ | 2 | | ⅜ | .5 |
| F-90X<br>F-390X | 115†<br>230† | 10-20 CT-40 CT | .1 | 15 | 30 | 1500 | X | Leads | 1⅜ | 2 13/16 | 1⅜ | 2⅜ | | ⅜ | .7 |
| F-91X<br>F-391X | 115†<br>230† | 10-20 CT-40 CT | .3 | 15 | 30 | 1500 | X | Leads | 2 5/32 | 3 1/16 | 2 | 3⅛ | | ⅜ | 1.5 |
| F-93X<br>F-393X | 115†<br>230† | 10-20 CT-40 CT | .75 | 15 | 30 | 1500 | X | Leads | 2 15/32 | 4 | 2¼ | 3 5/16 | | ⅜ | 2.4 |
| F-92A<br>F-392A | 115†<br>230† | 10-20 CT-40 CT | 1 | 15 | 30 | 1500 | A | Leads (2 Holes) | 3 5/16 | 2 17/32 | 3 | 2 | 2 5/16 | ⅜×⅝ | 3.25 |

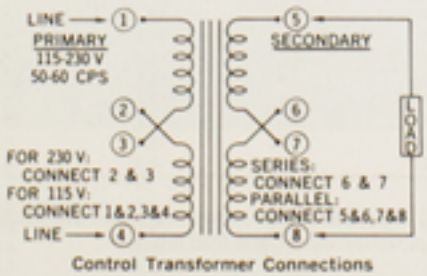
*FWB Rectifier Circuit  NOTE: 230 volt primaries can also be used with 277v.  †Tapped primary to produce lower voltages.

## CONTROL TRANSFORMERS / primary 115/230V, 50-60 Hz, 6, 12, 24 volt secondaries

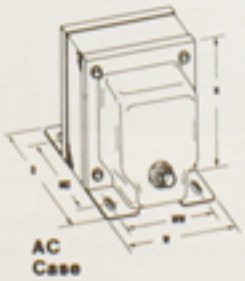
For use with relays, solenoids, small motors, speed changers, pumps, heating elements, control valves for fluids and gases, fans and blowers, electronic tubes, automatic assembly equipment, recording devices, elevators, door openers, low voltage lamps and similar applications.

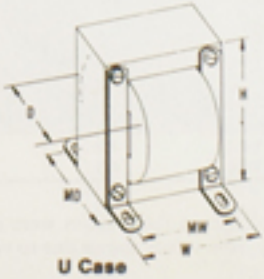
| Type No. | Secondaries Individual | Parallel | Series CT | VA Rating | Case Type | Connections | Case Dimensions H | W | D | Mounting Dimension MW | MD | Mtg. Hole Size | Shpg. Wt. in Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-105Z | 6V @ 1A | 6V @ 2A | 12V @ 1A | 12 | Z | Lugs | 2⅜ | 2⅛ | 1¾ | 2⅜ | | ⅜ | 1 |
| F-106Z | 6V @ 2A | 6V @ 4A | 12V @ 2A | 24 | Z | Lugs | 2¾ | 3⅛ | 2 | 2 13/16 | | ⅜ | 1½ |
| F-107Z | 12V @ 2A | 12 @ 4A | 24V @ 2A | 48 | Z | Lugs | 3⅛ | 3⅜ | 2⅜ | 3⅛ | | ⅜ | 2½ |
| F-398U | 12V @ 3A | 12V @ 6A | 24V @ 3A | 72 | U | Lugs | 3 15/32 | 2 13/16 | 2 13/16 | 2¼ | 2¼ | ⅝×⅝ | 4½ |
| F-108U | 12V @ 4A | 12V @ 8A | 24V @ 4A | 96 | U | Lugs | 3 15/32 | 2 13/16 | 2 13/16 | 2¼ | 2¼ | ⅝×⅝ | 4½ |
| F-399U | 12V @ 6A | 12V @ 12A | 24V @ 6A | 144 | U | Lugs | 3⅝ | 3⅛ | 3½ | 2½ | 2⅜ | ⅝×⅝ | 5.9 |
| F-109U | 12V @ 8A | 12V @ 16A | 24V @ 8A | 192 | U | Lugs | 4 5/16 | 3 1/16 | 3 5/16 | 2¾ | 3 | ⅝×⅝ | 8 |
| F-211Z | 24V @ .25A | 24V @ .5A | 48V @ .25A | 12 | Z | Lugs | 2⅜ | 2⅛ | 1¾ | 2⅜ | | ⅜ | .678 |
| F-212Z | 24V @ .5A | 24V @ 1.0A | 48V @ .50A | 24 | Z | Lugs | 2¾ | 3⅛ | 2 | 2 13/16 | | ⅜ | 1.05 |
| F-213Z | 24V @ 1A | 24V @ 2.0A | 48V @ 1.0A | 48 | Z | Lugs | 3⅛ | 3⅜ | 2⅜ | 3⅛ | | ⅜ | 2.25 |
| F-214U | 24V @ 2A | 24V @ 4.0A | 48V @ 2.0A | 96 | U | Lugs | 3 15/32 | 2 13/16 | 3 5/16 | 2¼ | 2⅜ | ⅝×⅝ | 3.24 |
| F-400U | 24V @ 3A | 24V @ 6A | 48V @ 3A | 144 | U | Lugs | 3⅝ | 3⅛ | 3½ | 2½ | 2⅜ | ⅝×⅝ | 5.9 |
| F-215U | 24V @ 4A | 24V @ 8.0A | 48V @ 4.0A | 192 | U | Lugs | 4 5/16 | 3 1/16 | 3⅜ | 2¾ | 3 | ⅝×⅝ | 6.06 |





Control Transformer Connections


AC Case


U Case

Other control transformers in standard commercial constructions, with single and multiple primaries and secondaries will be found on pages 8, 9, 10, and 11. They are listed in order of increasing secondary voltages. Low voltage, low current plug-in types will be found on pages 4, 5, 6, and 7, in single and dual primaries, dual and triple secondaries.

| F-204U | | FULL WAVE CENTER-TAPPED 8.0 ADC | | | | FULL WAVE BRIDGE | | 4.0 ADC | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resistive Load | | Capacitive Load (4000 mfd) | | Resistive Load | | Capacitive Load (2000 mfd) | |
| Input Terminals | Tie Terminals | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts |
| 1-2 | | 29.3 | 11.8 | 29.7 | 14.5 | 29.3 | 24.4 | 29.2 | 34.0 |
| 1-7 | 2-6 | 26.0 | 10.3 | 26.2 | 12.2 | 26.0 | 21.4 | 25.8 | 29.2 |
| 1-6 | 2-5 | 23.2 | 9.0 | 23.3 | 10.5 | 23.2 | 18.9 | 23.0 | 25.4 |
| 1-7 | 2-5 | 20.9 | 8.1 | 21.0 | 9.2 | 20.8 | 16.8 | 20.7 | 22.4 |
| 1-3 | | 19.5 | 7.5 | 19.6 | 8.5 | 19.4 | 15.7 | 19.4 | 20.8 |
| 1-7 | 3-6 | 17.8 | 6.6 | 17.9 | 7.6 | 17.8 | 14.2 | 17.7 | 18.6 |
| 1-6 | 3-5 | 16.5 | 6.0 | 16.5 | 6.5 | 16.4 | 12.9 | 16.4 | 16.8 |
| 1-7 | 3-5 | 15.3 | 5.5 | 15.3 | 5.9 | 15.2 | 11.9 | 15.2 | 15.2 |
| 1-4 | | 14.5 | 5.1 | 14.5 | 5.6 | 14.4 | 11.2 | 14.4 | 14.3 |
| 1-7 | 4-6 | 13.6 | 4.7 | 13.6 | 5.1 | 13.5 | 10.4 | 13.5 | 13.0 |
| 1-6 | 4-5 | 12.7 | 4.3 | 12.7 | 4.6 | 12.6 | 9.6 | 12.6 | 12.0 |
| 1-7 | 4-5 | 12.0 | 4.0 | 12.0 | 4.2 | 11.9 | 9.0 | 11.9 | 11.0 |

| F-205U | | FULL WAVE CENTER-TAPPED 12.0 ADC | | | | FULL WAVE BRIDGE | | 6.0 ADC | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resistive Load | | Capacitive Load (6000 mfd) | | Resistive Load | | Capacitive Load (3000 mfd) | |
| Input Terminals | Tie Terminals | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts |
| 1-2 | | 30.0 | 12.0 | 29.8 | 14.8 | 29.7 | 24.6 | 29.7 | 33.6 |
| 1-7 | 2-6 | 26.2 | 10.3 | 26.0 | 12.3 | 25.9 | 21.3 | 25.9 | 28.4 |
| 1-6 | 2-5 | 24.0 | 9.4 | 23.8 | 11.2 | 23.8 | 19.4 | 23.8 | 25.4 |
| 1-7 | 2-5 | 21.6 | 8.3 | 21.3 | 9.4 | 21.3 | 17.2 | 21.3 | 22.2 |
| 1-3 | | 19.9 | 7.6 | 19.8 | 8.8 | 19.7 | 15.9 | 19.7 | 20.2 |
| 1-7 | 3-6 | 18.2 | 6.8 | 18.0 | 7.7 | 18.0 | 14.2 | 17.9 | 17.9 |
| 1-6 | 3-5 | 17.2 | 6.3 | 17.0 | 7.0 | 16.9 | 13.3 | 16.8 | 16.5 |
| 1-7 | 3-5 | 15.8 | 5.7 | 15.6 | 6.2 | 15.5 | 12.1 | 15.5 | 14.8 |
| 1-4 | | 14.8 | 5.2 | 14.8 | 5.7 | 14.7 | 11.4 | 14.6 | 13.8 |
| 1-7 | 4-6 | 13.8 | 4.7 | 13.8 | 5.2 | 13.8 | 10.5 | 13.7 | 12.6 |
| 1-6 | 4-5 | 13.1 | 4.4 | 13.0 | 4.7 | 13.1 | 9.9 | 13.0 | 11.7 |
| 1-7 | 4-5 | 12.3 | 4.1 | 12.2 | 4.3 | 12.3 | 9.2 | 12.2 | 10.8 |

| F-206U | | FULL WAVE CENTER-TAPPED 15.0 ADC | | | | FULL WAVE BRIDGE | | 8.0 ADC | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resistive Load | | Capacitive Load (7500 mfd) | | Resistive Load | | Capacitive Load (4000 mfd) | |
| Input Terminals | Tie Terminals | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts |
| 1-2 | – | 30.1 | 12.5 | 30.0 | 16.0 | 30.0 | 25.0 | 30.0 | 36.0 |
| 1-7 | 2-6 | 26.7 | 10.9 | 26.8 | 13.9 | 26.7 | 21.8 | 26.8 | 31.2 |
| 1-6 | 2-5 | 23.9 | 9.6 | 23.9 | 12.0 | 23.7 | 19.1 | 23.7 | 27.5 |
| 1-7 | 2-5 | 21.5 | 8.6 | 21.5 | 10.4 | 21.2 | 17.1 | 21.2 | 24.4 |
| 1-3 | – | 19.8 | 7.8 | 19.9 | 9.5 | 19.8 | 15.7 | 19.8 | 22.3 |
| 1-7 | 3-6 | 18.2 | 7.2 | 18.2 | 8.4 | 18.0 | 14.4 | 18.0 | 20.6 |
| 1-6 | 3-5 | 16.8 | 6.5 | 16.8 | 7.4 | 16.7 | 13.1 | 16.7 | 18.2 |
| 1-7 | 3-5 | 15.5 | 6.0 | 15.5 | 6.7 | 15.3 | 11.9 | 15.3 | 16.5 |
| 1-4 | – | 14.8 | 5.6 | 14.8 | 6.3 | 14.6 | 11.3 | 14.6 | 15.3 |
| 1-7 | 4-6 | 13.8 | 5.2 | 13.8 | 5.7 | 13.6 | 10.4 | 13.6 | 14.0 |
| 1-6 | 4-5 | 12.7 | 4.8 | 12.9 | 5.1 | 12.8 | 9.6 | 12.8 | 12.9 |
| 1-7 | 4-5 | 12.1 | 4.5 | 12.1 | 4.8 | 12.0 | 8.9 | 12.0 | 12.0 |

| F-207U | | FULL WAVE CENTER-TAPPED 22.5 ADC | | | | FULL WAVE BRIDGE | | 12.0 ADC | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resistive Load | | Capacitive Load (11,250 mfd) | | Resistive Load | | Capacitive Load (6000 mfd) | |
| Input Terminals | Tie Terminals | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts |
| 1-2 | – | 29.6 | 12.2 | 29.5 | 15.9 | 29.7 | 24.3 | 30.0 | 35.5 |
| 1-7 | 2-6 | 26.9 | 10.8 | 26.5 | 13.6 | 26.4 | 21.4 | 26.3 | 31.0 |
| 1-6 | 2-5 | 24.2 | 9.5 | 23.9 | 12.0 | 24.0 | 19.3 | 23.8 | 27.8 |
| 1-7 | 2-5 | 21.8 | 8.5 | 21.8 | 10.6 | 21.8 | 17.3 | 21.7 | 24.8 |
| 1-3 | – | 19.6 | 7.6 | 19.7 | 9.2 | 19.7 | 15.6 | 19.6 | 21.9 |
| 1-7 | 3-6 | 18.2 | 7.0 | 18.1 | 8.3 | 18.1 | 14.3 | 18.1 | 19.9 |
| 1-6 | 3-5 | 16.9 | 6.4 | 16.8 | 7.5 | 16.8 | 13.2 | 16.8 | 18.2 |
| 1-7 | 3-5 | 15.8 | 6.0 | 15.8 | 6.9 | 15.6 | 12.0 | 15.7 | 16.8 |
| 1-4 | – | 14.5 | 5.4 | 14.3 | 6.1 | 14.6 | 11.2 | 14.4 | 15.0 |
| 1-7 | 4-6 | 13.8 | 5.1 | 13.5 | 5.5 | 13.6 | 10.3 | 13.6 | 14.0 |
| 1-6 | 4-5 | 13.0 | 4.8 | 12.9 | 5.2 | 13.0 | 9.6 | 12.9 | 12.9 |
| 1-7 | 4-5 | 12.1 | 4.4 | 12.1 | 4.8 | 12.2 | 9.0 | 12.2 | 12.2 |

The voltages in these tables were obtained using silicon rectifiers, and capacitor values shown for capacitive loads. Actual voltages obtained may vary slightly from values shown due to voltage drops across rectifiers, actual capacitor values, and lead losses.

It may be necessary to de-rate current values in capacitive circuits by 15-20% for lower transformer and rectifier temperatures if the higher temperatures produced by these circuits are objectionable. Be sure to choose rectifiers with suitable characteristics to handle voltages and currents shown, as well as PIV and surge currents which will be encountered.

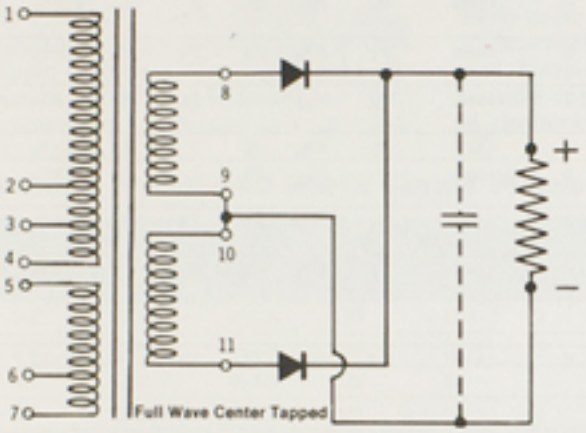
## UNIVERSAL RECTIFIER POWER / primary 117 volts, 50-60 Hz

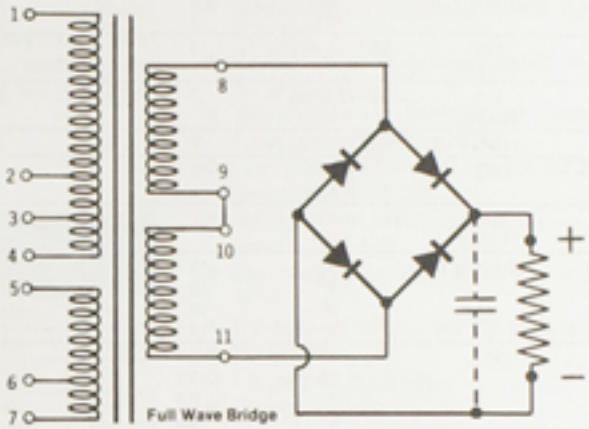
These Triad units give maximum flexibility when integrated into full-wave CT or bridge type circuits with silicon or selenium rectifiers.

No. F-200A has two identical secondary windings, each supplying 13 or 18 AC volts at 900 DC ma. Secondary voltages are selected by primary taps. The other 6 units have primaries connected to terminals 1, 2, 3 and 4. A separate winding connected to terminals 5, 6, and 7 is used in series with the primary to increase or decrease the secondary voltage output. The secondaries of these 6 transformers consist of two identical windings which may be connected to give a wide variety of output voltages. Instructions packed with each unit indicate specific terminal connections and voltage combinations which may be obtained by using the taps on both primary and secondary windings, plus the "bucking" action of the additional primary winding.

The voltages in these tables were obtained using silicon rectifiers, and capacitor values shown for capacitive loads. Actual voltages obtained may vary slightly from values shown due to voltage drops across rectifiers, actual capacitor values, and lead losses.

It may be necessary to de-rate current values in capacitive circuits by 15-20% for lower transformer and rectifier temperatures if the higher temperatures produced by these circuits are objectionable. Be sure to choose rectifiers with suitable characteristics to handle voltages and currents shown, as well as PIV and surge currents which will be encountered.




| Type No. | Secondary No. 1 AC Volts | Secondary DC Amps Full Wave CT | Secondary DC Amps Bridge | Secondary No. 2 AC Volts | Secondary No. 2 DC Amps | RMS Test Volts | Case Type | Connections | Case Dimensions H | Case Dimensions W | Case Dimensions D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-200A | 13 or 18 @ .9 ADC | - | - | 13 or 18 @ .9 ADC | | 1500 | A | Leads | 3 9/32 | 2 11/32 | 2 1/8 | 2 | 2 | 3/8 × 3/4 | 2.7 |
| F-202U | 11.0 to 29.5 | 2.0 | 1.25 | | | 1500 | U | Lugs | 3 | 2 1/2 | 3 | 2 | 2 1/8 | 5/16 × 3/8 | 2.5 |
| F-203U | 12.0 to 30.0 | 4.0 | 2.0 | | | 1500 | U | Lugs | 3 3/8 | 2 15/16 | 3 1/4 | 2 1/4 | 2 5/8 | 5/16 × 3/8 | 3.8 |
| F-204U | 11.5 to 29.0 | 8.0 | 4.0 | | | 1500 | U | Lugs | 3 3/4 | 3 1/8 | 4 1/8 | 2 1/2 | 2 7/8 | 5/16 × 3/8 | 6.1 |
| F-205U | 12.0 to 29.5 | 12.0 | 6.0 | | | 1500 | U | Lugs | 4 1/8 | 3 5/16 | 5 1/8 | 2 3/4 | 3 1/4 | 5/16 × 3/8 | 9.1 |
| F-206U | 12.1 to 29.2 | 15.0 | 8.0 | | | 1500 | U | Lugs | 4 7/16 | 3 3/4 | 5 | 2 15/16 | 3 3/8 | 5/16 × 3/8 | 12.6 |
| F-207U | 12.2 to 29.0 | 22.5 | 12.0 | | | 1500 | U | Lugs | 5 5/16 | 4 3/8 | 5 1/8 | 3 1/2 | 4 1/4 | 5/16 × 3/8 | 20.5 |

| F-202U | | FULL WAVE CENTER-TAPPED 2.0 ADC | | | | FULL WAVE BRIDGE | | 1.25 ADC | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resistive Load | | Capacitive Load (1000 mfd) | | Resistive Load | | Capacitive Load (500 mfd) | |
| Input Terminals | Tie Terminals | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts |
| 1-2 | | 30.2 | 12.2 | 30.0 | 15.3 | 29.3 | 24.6 | 29.3 | 33.3 |
| 1-7 | 2-6 | 27.0 | 10.6 | 26.9 | 13.0 | 26.2 | 21.7 | 26.0 | 28.6 |
| 1-6 | 2-5 | 23.8 | 9.2 | 23.7 | 11.1 | 23.0 | 18.9 | 23.0 | 24.6 |
| 1-7 | 2-5 | 21.7 | 8.2 | 21.7 | 9.8 | 20.7 | 16.9 | 20.7 | 21.8 |
| 1-3 | | 19.7 | 7.3 | 19.7 | 8.7 | 19.1 | 15.5 | 18.9 | 19.7 |
| 1-7 | 3-6 | 18.3 | 6.6 | 18.1 | 7.8 | 17.5 | 14.1 | 17.4 | 17.7 |
| 1-6 | 3-5 | 16.6 | 5.9 | 16.6 | 6.9 | 15.9 | 12.6 | 15.8 | 15.7 |
| 1-7 | 3-5 | 15.4 | 5.4 | 15.4 | 6.1 | 14.7 | 11.7 | 14.7 | 14.4 |
| 1-4 | | 14.7 | 5.1 | 14.7 | 5.7 | 14.1 | 11.1 | 14.0 | 13.4 |
| 1-7 | 4-6 | 13.8 | 4.7 | 13.7 | 5.1 | 13.2 | 10.2 | 13.1 | 12.4 |
| 1-6 | 4-5 | 12.8 | 4.3 | 12.8 | 4.6 | 12.2 | 9.4 | 12.2 | 11.2 |
| 1-7 | 4-5 | 12.2 | 3.9 | 12.1 | 4.2 | 11.5 | 8.8 | 11.4 | 10.3 |

| F-203U | | FULL WAVE CENTER-TAPPED 4.0 ADC | | | | FULL WAVE BRIDGE | | 2.0 ADC | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resistive Load | | Capacitive Load (2000 mfd) | | Resistive Load | | Capacitive Load (1000 mfd) | |
| Input Terminals | Tie Terminals | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts | Secondary AC Volts | D. C. Volts |
| 1-2 | | 29.8 | 12.0 | 29.7 | 15.0 | 29.5 | 24.7 | 29.5 | 34.7 |
| 1-7 | 2-6 | 26.7 | 10.6 | 26.6 | 12.8 | 26.3 | 21.9 | 26.3 | 30.3 |
| 1-6 | 2-5 | 24.7 | 9.7 | 24.5 | 11.7 | 24.3 | 20.1 | 24.2 | 27.4 |
| 1-7 | 2-5 | 22.4 | 8.6 | 22.2 | 10.2 | 22.0 | 18.0 | 22.1 | 24.4 |
| 1-3 | | 21.3 | 8.2 | 21.2 | 9.6 | 21.0 | 17.2 | 21.0 | 23.2 |
| 1-7 | 3-6 | 19.4 | 7.2 | 19.4 | 8.6 | 19.2 | 15.6 | 19.2 | 21.0 |
| 1-6 | 3-5 | 18.2 | 6.7 | 18.2 | 8.0 | 18.0 | 14.5 | 18.0 | 19.3 |
| 1-7 | 3-5 | 16.9 | 6.2 | 17.0 | 7.1 | 16.6 | 13.4 | 16.6 | 17.6 |
| 1-4 | | 14.8 | 5.2 | 14.7 | 5.8 | 14.5 | 11.4 | 14.5 | 14.8 |
| 1-7 | 4-6 | 13.8 | 4.8 | 13.8 | 5.3 | 13.7 | 10.6 | 13.6 | 13.6 |
| 1-6 | 4-5 | 13.2 | 4.5 | 13.2 | 4.9 | 13.1 | 10.1 | 12.9 | 12.8 |
| 1-7 | 4-5 | 12.9 | 4.2 | 12.4 | 4.6 | 12.3 | 9.4 | 12.3 | 11.9 |

# Power Transformers

TRIAD-UTRAD
A Division of Magnetek, Inc.

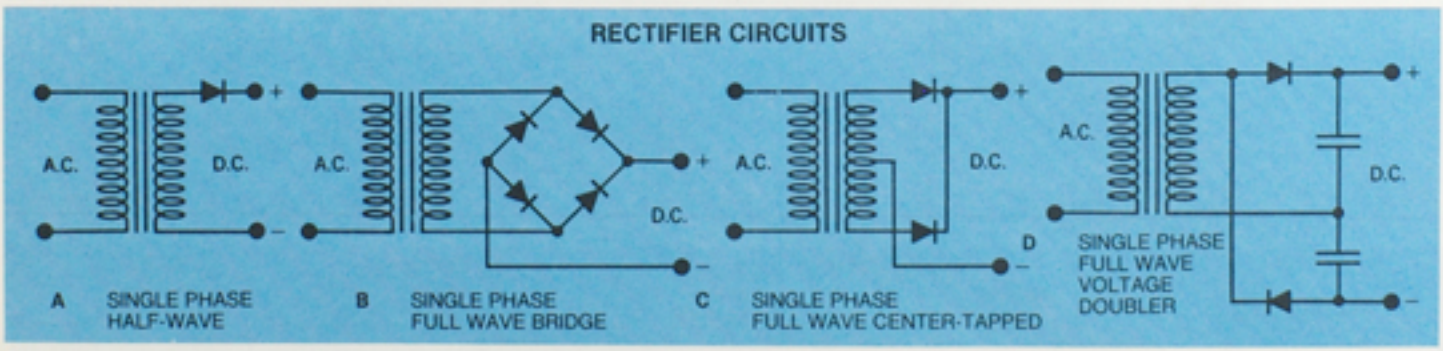
Triad Universal Rectifier Power Transformers are designed for solid-state rectifier supplies. The DC voltage shown is for circuits A and B. Higher voltage can be obtained through the use of capacitor input filters; in that case, however, rated DC current must be reduced approximately by 2. If a voltage doubler circuit (D) is used, current must be reduced approximately by 4.

## UNIVERSAL RECTIFIER POWER / primary 50-60 Hz

| Type No. | Primary Volts | Secondary AC Volts | Secondary AC Amps | DC Volts Half Wave | DC Volts Bridge | RMS Test Voltage | Case Type | Connections | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-47U<br>F-347U | 115<br>115/230 | 0-17-18 | 3 | 6-7 | 13-14 | 1500 | U | Leads | 3 | 2½ | 2¾ | 1⅝ | 2⅜ | ¼×⅛ | 3.2 |
| F-48U | 115 | 0-17-18 | 6 | 6-7 | 13-14 | 1500 | U | Leads | 3 1/16 | 3 1/16 | 3 1/16 | 2½ | 2 1/16 | 5/16×5/16 | 5.5 |
| F-49U | 115 | 36*<br>36* | 3<br>3 | 13<br>13 | 26<br>26 | 1500 | U | Leads | 4⅜ | 3 1/16 | 3¾ | 3 | 3 1/16 | 5/16×5/16 | 9.75 |
| F-60U●<br>F-360U | 115<br>115/230 | 0-6.5-13-19.5-26 | 3 | 9 | 18 | 1500 | U | Leads | 3⅜ | 2 13/16 | 2⅝ | 2¼ | 2 5/16 | 5/16×5/16 | 3.5 |
| F-61U<br>F-361U | 115<br>115/230 | 0-24-27-30-33-36 | 3 | 13 | 26 | 1500 | U | Leads | 3¾ | 3⅛ | 3¼ | 2½ | 2⅝ | 5/16×5/16 | 5.65 |
| F-67U# | 110-120 | 0-24-27-30-33-36 | 8 | 13 | 26 | 1500 | U | Leads | 4⅜ | 3 1/16 | 4⅜ | 3 | 3 5/16 | 5/16×5/16 | 10.75 |
| F-63U | 115 | 0-8-9*<br>0-8-9* | 2<br>2 | - | 6-7<br>6-7 | 1500 | U | Leads | 2 | 2½ | 2½ | 2 | 2 1/16 | 5/16×5/16 | 2.3 |
| F-64U<br>F-364U | 115<br>115/230 | 0-7-8-9 | 7 | - | 5-6-7 | 1500 | U | Leads | 3⅜ | 2 13/16 | 2¾ | 2¼ | 2 5/16 | 5/16×5/16 | 3.5 |
| F-62U# | 105-115-125 | 9*<br>9*<br>9*<br>9* | 10<br>10<br>10<br>10 | -<br>-<br>-<br>- | 7<br>7<br>7<br>7 | 1500 | U | Leads | 4⅜ | 3 1/16 | 5¼ | 3 | 4 5/16 | 5/16×5/16 | 16 |
| F-68U# | 115 | 9CT*<br>9*<br>9*<br>9* | 3.5<br>3.5<br>3.5<br>3.5 | -<br>-<br>-<br>- | 7<br>7<br>7 | 1500<br><br>7<br> | U | Leads | 3 1/16 | 3 1/16 | 3 1/16 | 2½ | 2 1/16 | 5/16×5/16 | 5 |
| F-65U | 110-120 | 0-140-150-160 | .75 | 60 | 115 | 1500 | U | Leads | 3 1/16 | 3 1/16 | 3⅜ | 2½ | 2 1/16 | 5/16×5/16 | 5.8 |
| F-74U | 117 | 28CT*<br>28CT* | 2<br>2 | -<br>- | -<br>- | 1500 | U | Lugs | 3 1/16 | 3 1/16 | 3¼ | 2½ | 2⅜ | 5/16×5/16 | 5.7 |
| F-75U | 117 | 28CT*<br>28CT* | 4<br>4 | -<br>- | -<br>- | 1500 | U | Lugs | 4⅛ | 3 1/16 | 4⅜ | 2¾ | 3⅜ | 5/16×5/16 | 10 |
| F-79U# | 115 | 0-24-26-28-30 | 15 | 11.4 | 22.8 | 1500 | U | Leads, Lugs | 3 1/16 | 4⅜ | 5½ | 3¾ | 4 5/16 | 5/16×5/16 | 18.5 |
| F-80U# | 115† | 0-12-13.5-15-16.5-18*<br>0-12-13.5-15-16.5-18* | 20<br>20 | -<br>- | 13<br>13 | 1500 | U | Leads | 5⅜ | 4 1/16 | 5½ | 2¾ | 4½ | ⅜Dia. | 25 |
| F-86U | 115 | 12CT | 10 | | | 1500 | U | Leads | 3¾ | 3⅛ | 3½ | 2½ | 2⅜ | 5/16×5/16 | 6.2 |
| F-84AC# | 115 or 230§ | 12CT*<br>12CT* | 10<br>10 | -<br>- | 8.5<br>8.5 | 2000 | AC | Leads (2 Holes) | 4⅜ | 3 1/16 | 5⅛ | 3 | 3⅜ | ⅜×5/16 | 12.7 |
| F-85U | 115† | 5-7.5*<br>5-7.5* | 20<br>20 | - | 8-12.5 | 1500 | U | Leads | 4½ | 3¾ | 4½ | 3 | 3½ | 5/16×5/16 | 12 |

*Windings may be connected in series to obtain their combined voltage when properly phased. Current will be equal to the current of the lowest winding. Example: Two 6.3V. windings @ 2A. in series would be 12.6V. @ 2A. Windings may also be connected in parallel to obtain the combined current. Example: Two 6.3V. windings @ 2A. in parallel would be 6.3V. @ 4A. ●Intermittent duty at max. rated output; continuous duty limited to both 50VA and 3A max.
‡Static Shield. #60 cycle operation. †Tapped primary to produce lower voltages. §Split winding. **CT** for Center Tap.

### RECTIFIER CIRCUITS




## SIGNALING / 50-60 Hz

| Type No. | Primary Volts | Secondary AC Volts | Amps | RMS Test Voltage | Case Type | Connections | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-102X | 115 | 4-8-12-16-20-24 | 2 | 2500 | X | Leads | 2 9/32 | 3 1/16 | 2⅛ | 3⅛ | | ⅛ | 1.75 |
| F-104U | 115 | 4-8-12-16-20-24 | 4 | 2500 | U | Leads | 3⅛ | 2⅞ | 2 5/16 | 2¼ | 2 1/16 | 5/16×5/16 | 3.13 |

## Portable and Hard Wire Voltage Regulators

From small or large computers, point-of-sale terminals, word processors — to virtually any microprocessor-based industrial control, the Linestar voltage regulators from Triad protect your equipment and operation with accurate voltage control.

Low voltage, noise, power surges, transients or even short time power disruptions can cause loss of memory or errors in your system.

Triad's Linestar series provides voltage regulation with the added feature of both common and transverse mode noise attenuation. With complete isolation from the power line, Linestar voltage regulators can be used as a portable dedicated line.

The Linestar voltage regulator suppresses transients and is current limiting so it protects against overloading. If you work from an AC source, the Linestar voltage regulator is a must for your equipment.

Linestar portable and hard wire voltage regulators provide better than 120 DB of common mode noise attenuation and greater than 60 DB of transverse (normal) mode noise attenuation. The waveshape is sinusoidal and contains less than 3 percent harmonic distortion, making the Linestar regulator excellent for any type of electronic load.

Output regulation is a ±3 percent with input line voltage as great as ±15 percent. Linestar voltage regulators will still maintain voltage output for inputs outside this range. Units up to 2kVA are portable and are designed for office operation.

### Linestar Features (Portable Models)

- Accurate voltage regulation.
- Rejection of common mode noise of 120 DB.
- Rejection of transverse mode noise of 60 DB.
- Absolutely no installation costs with Linestar portable models.
- Complete isolation from power line — less than 2.5 PFD.
- Suitable for office operation — sound level of 45 DB.
- Operation in ambients of −20° to 50°C.
- No loss of output for up to 3 m/s.
- Input line cord.
- Output receptacles.
- Power switch.

## Portable Models 60 Hertz Single Phase

| Output VA Rating | Catalog Number | Input Voltage Range | Nominal Output Voltage | Approx. Unit Wt. (lbs.) | Figure Code | Dimensions (Inches) A (Length) | B (Width) | C (Height) |
|---|---|---|---|---|---|---|---|---|
| 140 | K6-0600 | 95-130 | 120 | 15½ | 1 | 12⅛ | 4⅛ | 7⅛ |
| 250 | K6-0700 | 95-130 | 120 | 20 | 1 | 12⅛ | 4⅛ | 7⅛ |
| 300 | K6-0800 | 95-130 | 120 | 30 | 1 | 16⅛ | 9¼ | 8⅛ |
| 500 | K6-0900 | 95-130 | 120 | 40 | 1 | 16⅛ | 9¼ | 8⅛ |
| 750 | K6-1000 | 95-130 | 120 | 49 | 1 | 16⅛ | 9¼ | 8⅛ |
| 1000 | K6-1100 | 95-130 | 120 | 59 | 1 | 16⅛ | 9¼ | 8⅛ |
| 1500 | K6-1200 | 95-130 | 120 | 80 | 1 | 16⅛ | 11½ | 10¾ |
| 2000 | K6-1300 | 95-130 | 120 | 101 | 1 | 16⅛ | 11½ | 10¾ |

## Hard Wire Models 60 Hertz Single Phase

| Output VA Rating | Catalog Number | Input Voltage Range | Nominal Output Voltage | Approx. Unit Wt. (lbs.) | Figure Code | Dimensions (Inches) A (Length) | B (Depth) | C | D (Width) | E | Mounting Slots |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 300 | K6-0810* | 95-130, 190-260 | 120 | 28 | 2 | 12¼ | 6 | 5⅛ | 8⅛ | 5 | ⅛x⅜ |
| 500 | K6-0910* | 95-130, 190-260 | 120 | 37 | 2 | 13 | 6 | 5⅛ | 8⅛ | 5 | ⅛x⅜ |
| 500 | K6-0922* | 190-260, 380-520 | 120x240 | 37 | 2 | 13 | 6 | 5⅛ | 8⅛ | 5 | ⅛x⅜ |
| 500 | K6-0937* | 95-130, 175-235, 190-260 | 120x208 | 47 | 2 | 15¼ | 6 | 5⅛ | 8⅛ | 5 | ⅛x⅜ |
| 750 | K6-1032* | 95-130, 175-235, 190-260 | 120x240 | 47 | 2 | 15¼ | 6 | 5⅛ | 8⅛ | 5 | ⅛x⅜ |
| 1000 | K6-1122* | 190-260, 380-520 | 120x240 | 59 | 2 | 16¼ | 6 | 5⅛ | 8⅛ | 5 | ⅛x⅜ |
| 1000 | K6-1132* | 95-130, 175-235, 190-260 | 120x240 | 59 | 2 | 16¼ | 6 | 5⅛ | 8⅛ | 5 | ⅛x⅜ |
| 1000 | K6-1137* | 95-130, 175-235, 190-260 | 120x208 | 59 | 2 | 16¼ | 6 | 5⅛ | 8⅛ | 5 | ⅛x⅜ |
| 1500 | K6-1232* | 95-130, 175-235, 190-260 | 120x240 | 78 | 3 | 18¼ | 6 | 6⅛ | 8⅛ | 5 | ⅛x⅜ |
| 2000 | K6-1322* | 190-260, 380-520 | 120x240 | 101 | 3 | 19 | 9¼ | 3¼ | 11¼ | 5 | ⅛x⅜ |
| 2000 | K6-1332* | 95-130, 190-260, 175-235 | 120x240 | 101 | 3 | 19 | 9¼ | 3¼ | 11¼ | 5 | ⅛x⅜ |
| 2000 | K6-1337* | 95-130, 175-235, 190-260 | 120x208 | 101 | 3 | 19 | 9¼ | 3¼ | 11¼ | 5 | ⅛x⅜ |
| 2500 | K6-1422* | 190-260, 380-520 | 120x240 | 120 | 3 | 19⅛ | 9¼ | 4⅛ | 11¼ | 5 | ⅛x⅜ |
| 2500 | K6-1432* | 95-130, 175-235, 190-260 | 120x240 | 120 | 3 | 19⅛ | 9¼ | 4⅛ | 11¼ | 5 | ⅛x⅜ |
| 3000 | K6-1522* | 190-260, 380-520 | 120x240 | 130 | 3 | 20⅛ | 9¼ | 5⅛ | 11¼ | 5 | ⅛x⅜ |
| 3000 | K6-1532* | 95-130, 175-235, 190-260 | 120x240 | 130 | 3 | 20⅛ | 9¼ | 5⅛ | 11¼ | 5 | ⅛x⅜ |
| 3000 | K6-1537* | 95-130, 175-235, 190-260 | 120x208 | 130 | 3 | 20⅛ | 9¼ | 5⅛ | 11¼ | 5 | ⅛x⅜ |
| 3750 | K6-1622* | 190-260, 380-520 | 120x240 | 158 | 3 | 21⅛ | 9¼ | 6⅛ | 11¼ | 5 | ⅛x⅜ |
| 3750 | K6-1632* | 95-130, 175-235, 190-260 | 120x240 | 158 | 3 | 21⅛ | 9¼ | 6⅛ | 11¼ | 5 | ⅛x⅜ |

Portable Model

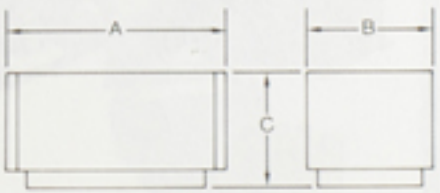



Figure 1

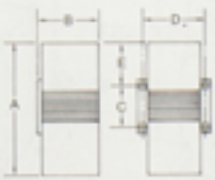



Figure 2

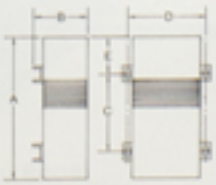



Figure 3


Hard Wire Model

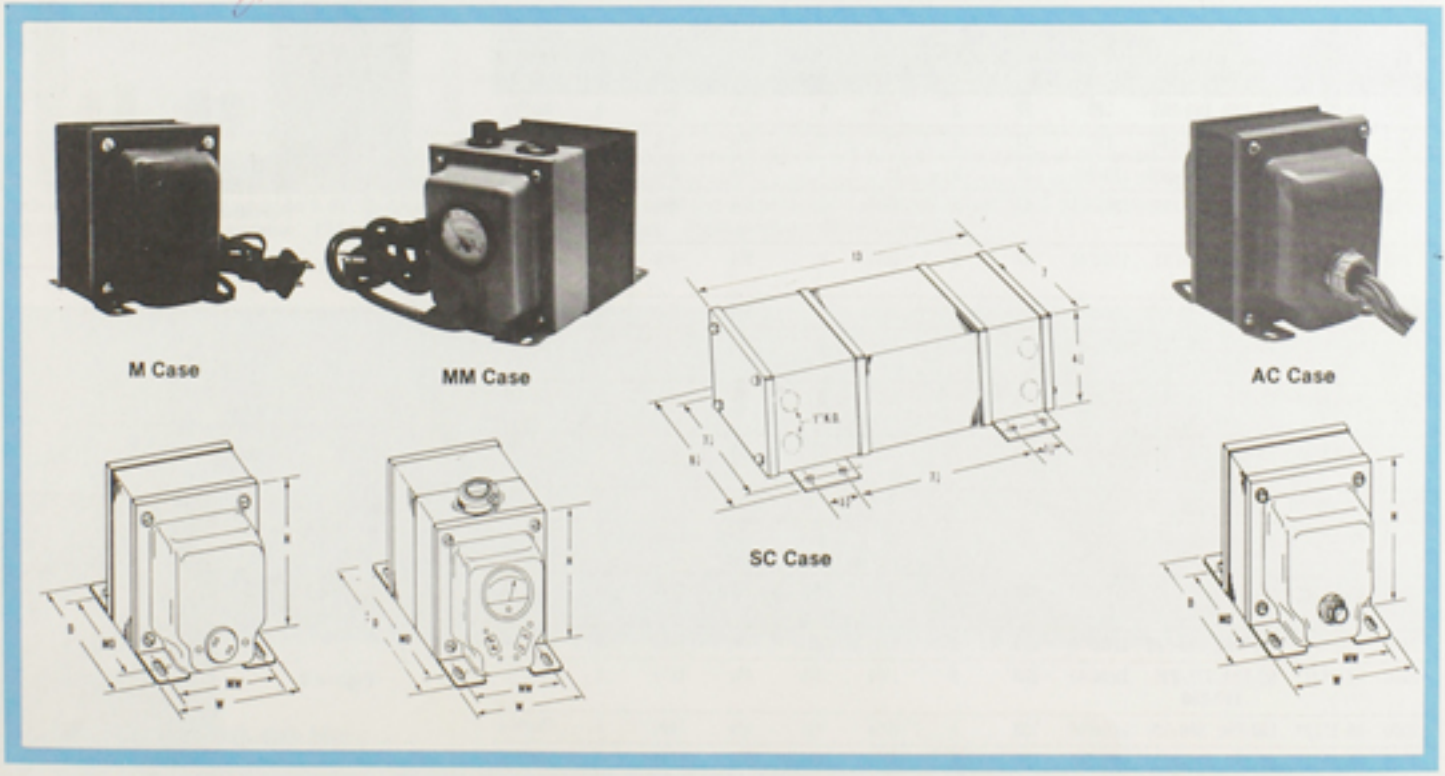
# Power Transformers

TRIAD-UTRAD
A Division of Magnetek, Inc.

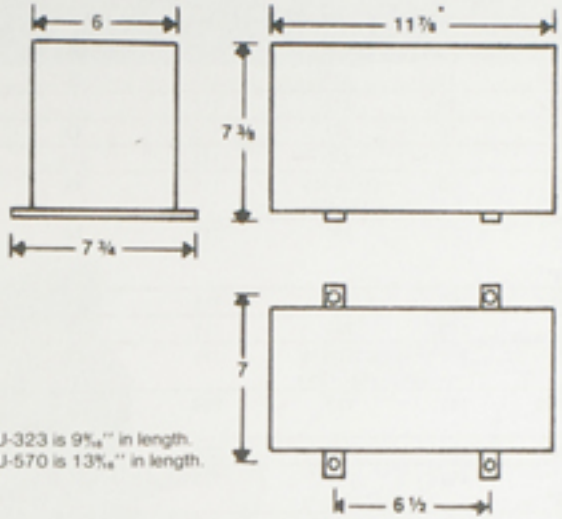
## ISOLATION / 50-60 Hz

All units on this page have static shields

| Type No. | Output Watts (VA) | Primary Volts | Secondary AC Volts ±5% | Secondary AC Amps | RMS Test Voltage | Case Type | Connections | Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N-48X | 15 | 115 | 115 | .13 | 1500 | X | Leads | - | 1 1/16 | 3 1/16 | 2 | 2 13/16 | - | 5/16 | 1.35 |
| N-49X | 35 | 115 | 57.5-115§ | .3 | 1500 | X | Leads | - | 2 5/32 | 3 1/16 | 2 1/8 | 3 1/8 | - | 5/16 | 1.9 |
| N-51X | 35 | 115 | 115 | .3 | 1500 | X | Leads | - | 2 5/32 | 3 1/16 | 2 1/8 | 3 1/8 | - | 5/16 | 1.7 |
| N-68X | 50 | 115-230§ | 115 | .435 | 1500 | X | Leads | - | 2 5/32 | 3 1/16 | 2 1/8 | 3 1/8 | - | 5/16 | 1.7 |
| N-53M<br>N-53MG* | 85 | 115 | 115 | .74 | 1500 | M | 6' Cord, Plug & Socket | - | 3 15/32 | 2 11/32 | 3 3/8<br>4 1/8 | 2 1/4 | 2 3/8<br>2 7/8 | 3/8 × 5/16 | 4.7 |
| N-76U | 100 | 115 | 115 | .86 | 1500 | U | Leads | - | 3 1/16 | 2 13/16 | 3 | 2 1/4 | 2 1/2 | 3/8 × 5/16 | 4 |
| N-77U | 100 | 115/230 | 115 | .86 | 1500 | U | Leads | - | 3 1/16 | 2 13/16 | 3 | 2 1/4 | 2 1/2 | 3/8 × 5/16 | 4 |
| N-78U | 100 | 115 | 115/230 | .43 | 1500 | U | Leads | - | 3 1/16 | 2 13/16 | 3 | 2 1/4 | 2 1/2 | 3/8 × 5/16 | 4 |
| N-54M<br>N-54MG* | 150 | 115 | 115 | 1.3 | 1500 | M | 6' Cord, Plug & Socket | - | 3 1/8 | 3 5/32 | 4 1/4<br>5 13/16 | 2 1/2 | 3<br>3 1/2 | 3/8 × 5/16 | 7 |
| N-73A | 150 | 115 | 115-230§ | .65 | 1500 | A | Leads | 1 | 3 1/8 | 3 5/32 | 3 3/8 | 2 1/2 | 2 3/4 | 3/8 × 5/16 | 7 |
| N-74A | 150 | 115 | 57.5-115§ | 1.3 | 1500 | A | Leads | 1 | 3 1/8 | 3 5/32 | 3 1/8 | 2 1/2 | 2 3/4 | 3/8 × 5/16 | 7 |
| N-67A | 150 | 115-230§ | 115 | 1.3 | 1500 | A | Leads | 2 | 3 1/8 | 3 5/32 | 3 1/8 | 2 1/2 | 3 | 3/8 × 5/16 | 7 |
| N-55M<br>N-55MG*<br>N-255MG* | 250 | 115<br>115<br>230 | 115 | 2.17 | 1500 | M | 6' Cord, Plug & Socket | - | 4 1/8 | 3 15/16 | 5 | 3 | 3 15/16 | 3/8 × 5/16 | 11 |
| N-66A | 250 | 115-230§ | 115 | 2.17 | 1500 | A | Leads | 2 | 4 1/8 | 3 15/16 | 4 1/8 | 3 | 3 5/8 | 3/8 × 5/16 | 11 |
| N-70MG* | 375 | 115 | 115 | 3.26 | 1500 | M | 6' Cord, Plug & Socket | - | 4 1/8 | 3 1/8 | 5 1/2 | 3 | 4 1/2 | 3/8 × 5/16 | 14.6 |
| N-57M<br>N-57MG*<br>N-257MG* | 500 | 115<br>115<br>230 | 115 | 4.35 | 1500 | M | 6' Cord, Plug & Socket | - | 5 5/16 | 4 1/2 | 6 1/4 | 3 1/2 | 5 1/8 | 1/2 × 1/4 | 23.75 |
| N-59M<br>N-59MG*<br>N-259MG* | 1000 | 115<br>115<br>230 | 115 | 8.7 | 1500 | M | 6' Cord, Plug & Socket | - | 5 5/16 | 4 1/2 | 8 | 3 1/2 | 6 1/8 | 1/2 × 1/4 | 34 |
| N-52M | 350 | 95-130<br>5V Steps | 115 | 3.04 | 250 | MM | Detachable 6' Cord Plug, Switch Socket & Meter | - | 4 1/8 | 3 15/16 | 7 1/4 | 3 | 6 1/8 | 3/8 × 5/16 | 17 |
| N-469A# | 50 | 220-440§ | 115 | .435 | 1500 | A | Leads | 1 | 3 1/16 | 2 11/32 | 2 1/2 | 2 | 1 15/16 | 3/8 × 5/16 | 2.3 |
| N-470A# | 150 | 220-440§ | 115 | 1.3 | 2000 | A | Leads | 1 | 3 1/8 | 3 5/32 | 3 3/8 | 2 1/2 | 2 1/2 | 3/8 × 5/16 | 5.5 |
| N-471A# | 300 | 220-440§ | 115 | 2.6 | 2000 | A | Leads | 1 | 4 1/8 | 3 15/16 | 4 1/8 | 3 | 3 3/8 | 3/8 × 5/16 | 10.25 |



## DIMENSIONS



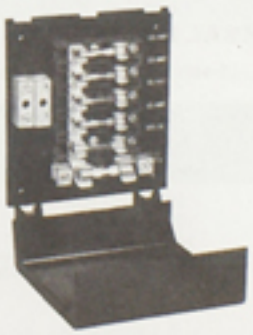

* TU-323 is 9 5/16" in length.
TU-570 is 13 5/16" in length.

## Converter/Battery Charger Specifications

| Triad-Utrad Model Number | Current Rating (D.C. Amps) | A.C. Input | | D.C. Output | | Automatic Reset Thermal Cutout | Agency Listing | Weight (Pounds) |
|---|---|---|---|---|---|---|---|---|
| | | Volts | Amps | Volts | Amps | | | |
| ☛ TU-730-2 | 30 | 95-130 60 Hz | 5.5 | 12.0 min. @ full load 14.1 max. @ no load | 30 | Yes | U.L. | 19 |
| ☛ TU-830-2 | 30 | 95-130 60 Hz | 5.5 | 12.0 min. @ full load 14.1 max. @ no load | 30 | Yes | C.S.A. | 19 |
| ☛ TU-740-2 | 40 | 95-130 60 Hz | 7.3 | 12.0 min. @ full load 14.1 max. @ no load | 40 | Yes | U.L. | 23 |
| ☛ TU-840-2 | 40 | 95-130 60 Hz | 7.3 | 12.0 min. @ full load 14.1 max. @ no load | 40 | Yes | C.S.A. | 23 |
| ☛ TU-750-2 | 50 | 95-130 60 Hz | 8.6 | 12.0 min. @ full load 14.1 max. @ no load | 50 | Yes | U.L. | 25 |
| ☛ TU-775-2 | 75 | 95-130 60 Hz | 14.5 | 12.0 min. @ full load 14.1 max. @ no load | 75 | Yes | U.L. | 25 |
| TU-700-2 | 40 | 200-240 50 Hz | 3.5 | 12.0 min. @ full load 14.1 max. @ no load | 40 | Yes | None | 23 |

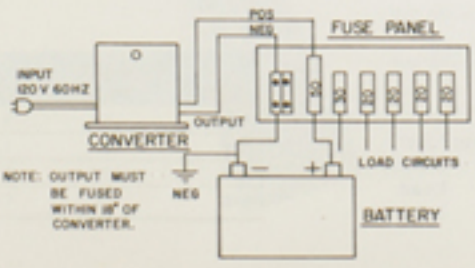
## Fuse Panel Specifications

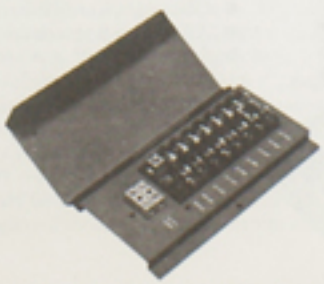
| Triad P/N | Description | Width | Length |
|---|---|---|---|
| FB-532P | 6 Circuit AGU 50 Battery Fuse, 1 SFE 30, 4 SFE 20, Plastic Case | 4½" | 5¼" |
| FB-315P | 5 Circuit SFE 30 Battery Fuse, 4 AGC 15, Plastic Case | 4½" | 5¼" |
| FB-431P | 6 Circuit AGU 40 Battery Fuse, 1 SFE 30, 4 AGC 15, Plastic Case | 4½" | 5¼" |
| FB-8532M | 9 Circuit AGU 50 Battery Fuse, 1 SFE 30, 7 SFE 20, Metal Case | 5¼" | 8¾" |
| FB-8315M | 8 Circuit SFE 30, Battery Fuse, 7 AGC 15, Metal Case | 5¼" | 8¾" |
| FB-8532CM | 9 Circuit same as FB-8532M except has closed ends to meet CSA | 5¼" | 8¾" |



FB-532P Fuse Panel

## TYPICAL CONNECTION DIAGRAM



FB-8532M Fuse Panel

☛ New Item

## STEPUP/STEPDOWN AUTOFORMERS / 50-60 Hz

| Type No. | Output Watts (VA) | Primary Volts | Secondary Volts ±5% | Secondary RMS Amps | RMS Test Voltage | Case Type | Connections | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F-290X# | 10 | 277 | 115 | .09 | 1750 | X | Leads | 1⅝ | 2⅜ | 1⅜ | 2 | | ⅛ | .45 |
| F-291X# | 20 | 277 | 115 | .17 | 1500 | X | Leads | 1 19/64 | 3¼ | 1 7/64 | 2 23/64 | | ⅛ | .8 |
| F-292X# | 50 | 277 | 115 | .43 | 1700 | X | Leads | 2¼ | 3 7/64 | 2⅜ | 3⅜ | | ⅛ | 1.7 |
| N-1X | 50 | 230 | 115 | .435 | 1500 | X | Leads | 2 5/32 | 3 7/64 | 2 | 3⅜ | | ⅛ | 1.5 |
| N-39X | 50 | 0-100-115-127-135 | 115 | .43 | 1500 | X | Lugs | 1 19/64 | 3¼ | 2 | 2 23/64 | | ⅛ | .8 |
| N-3M | 85 | 230 | 115 | .74 | 1500 | M | 6' Cord & Plug & Socket | 3 13/32 | 2 13/32 | 2⅜ | 2¼ | 1⅜ | ⅜×⅜ | 3 |
| N-3MG* | | | | | | | | | | 3½ | | 2⅛ | | |
| F-300X# | 100 | 277 | 115 | .87 | 2500 | X | Leads | 2 45/64 | 4 | 2 7/64 | 3 45/64 | | ⅛ | 2.3 |
| N-2X | 100 | 230 | 115 | .87 | 1500 | X | Leads | 2⅝ | 4 | 2 7/64 | 3⅝ | | ⅛ | 2.1 |
| N-40X | 100 | 0-100-115 127-135 | 115 | .87 | 1500 | X | Lugs | 1 19/64 | 3¼ | 2 23/64 | 2 23/64 | | ⅛ | 1.2 |
| N-150MG | 150 | 115 | 230 | .65 | 1500 | M | 6'-3 Wire Cord, Plug & Socket | 3 13/32 | 2 13/32 | 3 5/64 | 2¼ | 2⅛ | ⅜×⅜ | 4.9 |
| F-302U# | 150 | 277 | 115 | 1.3 | 2500 | U | Leads | 2 13/64 | 3⅜ | 2¼ | 2 13/64 | 2 | ⅜×⅜ | 2.9 |
| N-4M | 150 | 230 | 115 | 1.3 | 1500 | M | 6' Cord, Plug & Socket | 3 13/32 | 2 13/32 | 3⅜ | 2¼ | 2⅜ | ⅜×⅜ | 4.7 |
| N-4MG* | | | | | | | | | | 4¼ | | 2⅞ | | |
| N-34X | 150 | 0-95-105-115-125-135 | 115 | 1.3 | 1500 | X | Lugs | 2 13/32 | 4 | 2¼ | 3 45/64 | | ⅛ | 2.2 |
| N-33MG* | 150 | 65/75/90/100/115/130/145 | 115 | 1.3 | 1500 | MM | 6' Cord, Plug, Switch, Socket & Meter | 5 5/64 | 3 7/64 | 5½ | 3 | 4 5/64 | ⅜×⅜ | 6.4 |
| N-6U | 200 | 230 | 115 | 1.7 | 1500 | U | Leads | 3⅜ | 2 13/64 | 2 13/64 | 2¼ | 2¼ | ⅜×⅜ | 3.6 |
| N-250MG | 250 | 115 | 230 | 1.1 | 1500 | M | 6'-3 Wire Cord, Plug & Socket | 3⅛ | 3¼ | 3 7/64 | 2½ | 2 7/64 | ⅜×⅜ | 6.6 |
| N-5M | 250 | 230 | 115 | 2.17 | 1500 | M | 6' Cord, Plug & Socket | 3⅛ | 3 5/32 | 4¼ | 2½ | 3 | ⅜×⅜ | 7 |
| N-5MG* | | | | | | | | | | 4 13/64 | | 3½ | | |
| N-37MG* | 500 | 65/75/90/100/115/130/145 | 115 | 4.35 | 1500 | MM | 6' Cord, Plug, Switch, Socket & Meter | 5 5/64 | 3 7/64 | 7 | 3 | 5 13/64 | ⅜×⅜ | 15.0 |
| N-500MG | 500 | 115 | 230 | 2.2 | 1500 | M | 6'-3 Wire Cord, Plug & Socket | 4⅝ | 3⅜ | 4⅝ | 3 | 3⅝ | ⅜×⅜ | 11.2 |
| N-7M | 600 | 230 | 115 | 5.22 | 1500 | M | 6' Cord, Plug & Socket | 4⅝ | 3 7/64 | 5 | 3 | 3⅜ | ⅜×⅜ | 12 |
| N-7MG* | | | | | | | | | | | | | | |
| N-1000MG | 1000 | 115 | 230 | 4.35 | 1500 | M | 6'-3 Wire Cord, Plug & Socket | 5⅜ | 4½ | 5½ | 3½ | 4⅛ | ½×¾ | 17.39 |
| N-9M | 1250 | 230 | 115 | 10.85 | 1500 | M | 6' Cord, Plug & Socket | 5 5/64 | 4½ | 6¼ | 3½ | 5⅛ | ½×¾ | 24 |
| N-9MG* | | | | | | | | | | | | | | |
| N-11M | 2000 | 230 | 115 | 17.4 | 1500 | M | 6' Cord, Plug & Socket | 5⅛ | 4½ | 8¼ | 3½ | 6⅛ | 1/32×5/32 | 33.25 |
| N-11MG* | | | | | | | | | | | | | | |

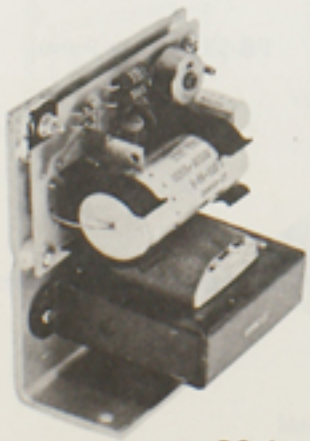
## UNIVERSAL ISOLATION / AUTOFORMER / VOLTAGE CONTROL / 50-60 Hz

Have four 115-volt windings. Both primary and secondary may be connected for 115 or 230 volts.

| Type No. | Output Watts (VA) Isolation | Output Watts (VA) Autoformer | RMS Test Voltage | Case Type | Connections | Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N-64AC | 500 | 1000 | 1500 | AC | Leads | 1 Conduit | 5 5/64 | 4½ | 5½ | 3½ | 3⅛ | ½×¾ | 15 |
| N-62U | 1000 | 2000 | 1500 | U | Leads | | 6½ | 5½ | 5 | 4¼ | 3¾ | ⅜×⅜ | 29.5 |
| N-60SC | 2000 | 4000 | 2500 | SC | Leads | Knockouts | 4⅝ | 8½ | 13½ | 7⅛ | 7⅛ | 5/32 | 56 |

*Has 3-wire plug, cord and socket. §Split winding. #60 cycle operation.

## Reliable, low cost general purpose supplies



P Series

**Features**

- Open Frame Construction
- Glass Epoxy Printed Circuit Board
- High Performance IC Regulator
- Computer Grade Filter Capacitor
- All Silicon Semiconductors
- Small Size 2½" × 4" × 4½" (Weight: 2 lbs. net, 2¼ lbs. shipping)
- Foldback Current Limiting and Short Circuit Protection
- Adjustable Output

**Specifications**

**Input:** 115V ± 10% 60 Hz ± 5% **Regulation:** Line: ±0.5% Load: ±0.5%

**Ripple:** 5 MV RMS or 15 MV pk to pk max.

**Temp Coefficient:** .2%/°C

**Grounding:** Floating output either positive or negative max. may be grounded

**Output Adjustment:** ±5%

| Type No. | Output Voltage | Output Current 40°C | Output Current 65°C |
|---|---|---|---|
| P-543 | 5V | 3.0A | 1.5A |
| P-546 | 12V | 1.5A | .8A |
| P-547 | 15V | 1.5A | .8A |
| P-548 | 24V | 1.0A | .5A |

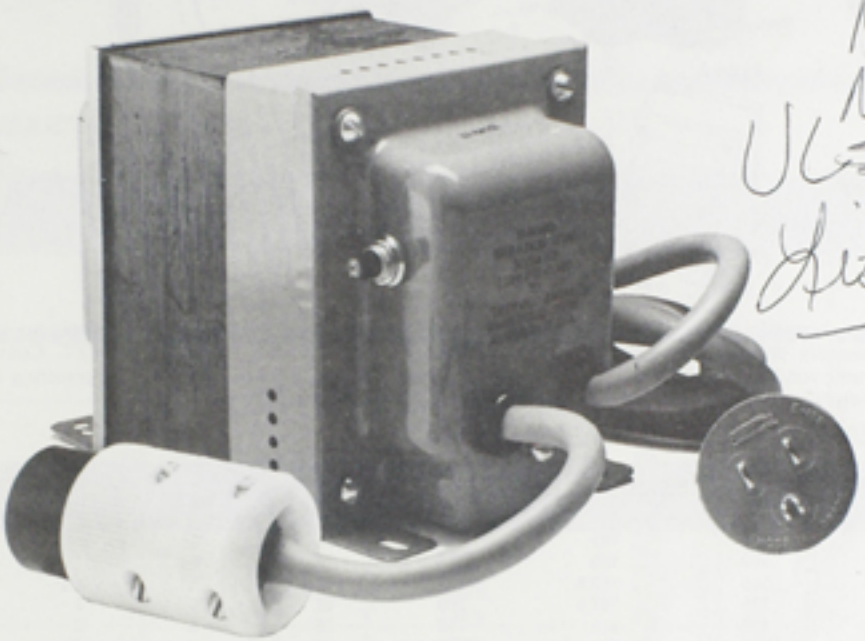
## Hospital Type Isolation Transformer

Triad-Utrad's new hospital type isolation transformers are designed and constructed to meet the low leakage current requirements for today's medical equipment needs. The transformers are constructed with non-concentrically precision wound coils. The primary and secondary are precision wound on separate arbors, then assembled on the laminate core side by side and separated by insulation. This allows for no electrical connection, under normal or overload conditions, between the primary and secondary windings. Units come with a resettable circuit breaker, offering protection from overload and short circuit conditions. Leakage current from primary to secondary is rated at less than 50 micro-amps and is typically measured at less than 10 micro-amps. Line cord, plug and receptacle are U.L. listed hospital grade and U.L. verified to meet federal specifications W-C-596E.

UL file # 544

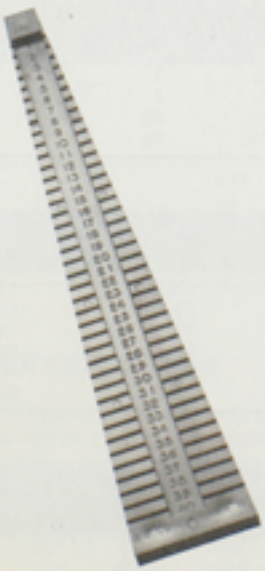
Magnetics #E102910 meets UL's 544 #

N90MD N92MD UL Listed



### LOW LEAKAGE-ISOLATION

| Type No. | Output Watts (VA) | Primary Volts | Secondary Volts | Secondary Amps | RMS Test Voltage | Case Type | Connections | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N-90-MD | 250 | 115 | 115 | 2.17 | 1500 | M | 6' Cord, Plug & Socket Circuit Breaker | 4⅛ | 3⅛ | 6⅛ | 3 | 4 19/64 | ⅜ × ⅜ | 11.9 |
| N-92-MD | 500 | 115 | 115 | 4.35 | 1500 | M | 6' Cord, Plug & Socket Circuit Breaker | 5 1/32 | 4½ | 7 | 3½ | 5⅛ | 21/32 × ⅜ | 17.6 |



No. MK-1

No. MK-2

No. MK-3

No. MK-4

No. MK-5

## Lead Bending Gauges

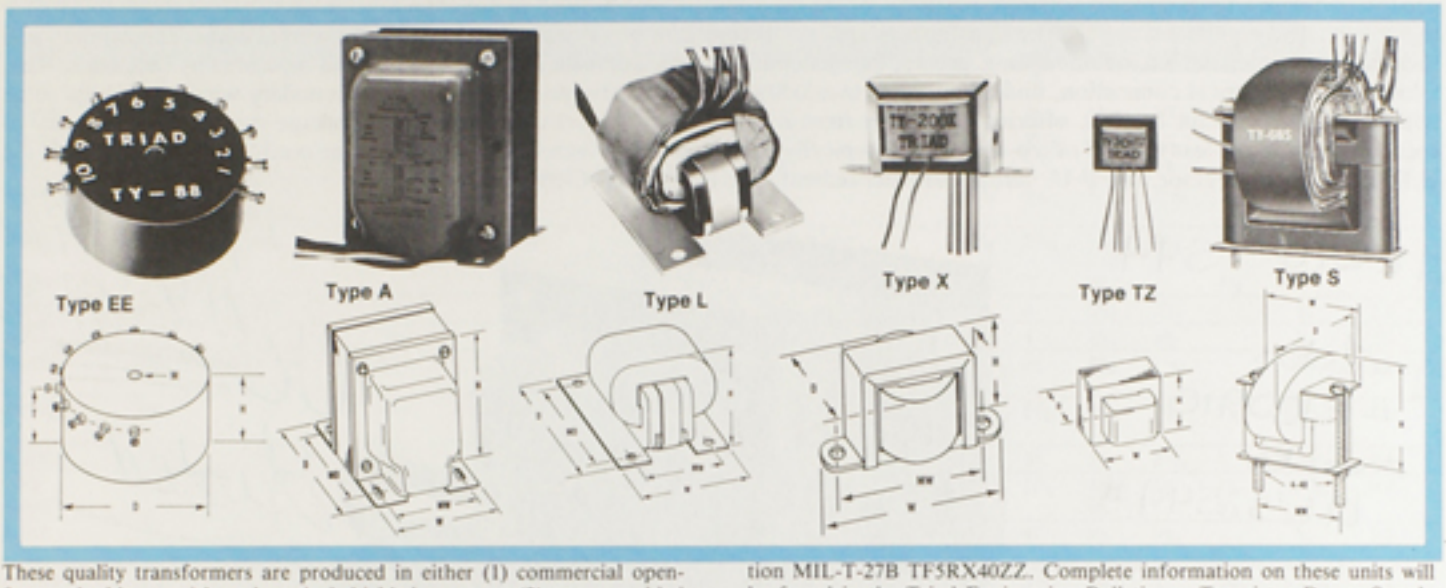
A set of five MK lead bending gauges will provide fast, accurate forming for most components used in printed board circuitry. All models have 40 numbered positions. Each position is numbered and leads are bent rapidly with gentle finger pressure. No other tools are required. Aggravation and physical damage to components associated with "free bending" by longnose pliers are completely eliminated.

The MK-1 gauge (.375 to 1.50 centers) is designed for ¼-watt resistors, although diodes, disc capacitors and other parts of similar size may be processed. The MK-2 gauge (.50 to 1.50 centers) is for ½-watt resistors and items of similar sizes. The MK-3 gauge (.75 to 2.50 centers) is designed for 1-watt resistors and similar components. The MK-4 (.875 to 2.50 centers) is used on 2-watt resistors and items of similar size, with special features to accommodate the DO outline "TOP HAT" diodes. The MK-5 (.260 to 1.42 mounting centers) accepts all ¼-watt resistors and diodes—standard RC05 and DP-35 type components. These methods are currently being employed to determine the correct component lead spacing:

# Power Transformers

TRIAD-UTRAD
A Division of Magnetics, Inc.

## For Transistor Power Supplies




These quality transformers are produced in either (1) commercial open-frame, double, varnish and vertical-shielded types, or (2) epoxy molded toroidal types exceeding the Grade 5, Class R requirements of Specification MIL-T-27B TF5RX40ZZ. Complete information on these units will be found in the Triad Engineering Bulletin on Transistor Power Supply Transformers.

### EPOXY MOLDED TOROIDAL TYPE / dc to dc

| Type No. | D.C. Source Volts | D.C. Volts out of Rectifier F.W. Bridge | D.C. Volts out of Rectifier F.W.C.T. | D.C. Milliamps. Maximum | Case Type | Dimensions-Inches T | D | H | M | Weight Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|
| TY-78 | 12.6 | 250 | 125 | 100 | EE | ½ | 1¾ | 1 1/16 | 1 3/64 | .35 |
| TY-79 | 12.6 | 300 | 150 | 200 | EE | ¾ | 1¾ | 1 | 1 3/64 | .35 |
| TY-80 | 12.6 | 325 | 162.5 | 150 | EE | ¾ | 1¾ | 1 | 1 3/64 | .35 |
| TY-81 | 12.6 | 375 | 187.5 | 200 | EE | ¾ | 2 | 1 | 1 3/64 | .50 |
| TY-82 | 12.6 | 450 | 225 | 150 | EE | ¾ | 2 | 1 | 1 3/64 | .50 |
| TY-83 | 12.6 | 500 | 250 | 250 | EE | 1⅛ | 2⅜ | 1⅛ | 5/16 | .85 |
| TY-84 | 12.6 | 600 | 300 | 200 | EE | 1⅛ | 2⅜ | 1⅛ | 5/16 | 1.00 |
| TY-85 | 12.6 | 600 | 300 | 350 | EE | 1⅛ | 2⅜ | 1⅛ | 1 3/64 | 2.00 |
| TY-86 | 12.6 | 425 | 212.5 | 350 | EE | 1⅛ | 2⅜ | 1⅛ | 5/16 | 1.00 |
| TY-88 | 28 | 250 | 125 | 80 | EE | 1 3/32 | 1 5/16 | 5/16 | 3/64 | .25 |
| TY-89 | 28 | 300 | 150 | 100 | EE | ½ | 1¾ | 1 1/16 | 1 3/64 | .35 |
| TY-90 | 28 | 325 | 162.5 | 200 | EE | ¾ | 1¾ | 1 | 1 3/64 | .35 |
| TY-91 | 28 | 375 | 187.5 | 200 | EE | ¾ | 2 | 1 | 1 3/64 | .50 |
| TY-92 | 28 | 450 | 225 | 200 | EE | ¾ | 2 | 1 | 1 3/64 | .50 |
| TY-93 | 28 | 500 | 250 | 250 | EE | 1⅛ | 2⅜ | 1⅛ | 5/16 | .85 |
| TY-94 | 28 | 600 | 300 | 200 | EE | 1⅛ | 2⅜ | 1⅛ | 5/16 | 1.00 |
| TY-99 | 6 | 300 | 150 | 100 | EE | ¾ | 1¾ | 1 | 1 3/64 | .35 |
| TY-100 | 6 | 325 | 162.5 | 150 | EE | ¾ | 2 | 1 | 1 3/64 | .50 |
| TY-101 | 6 | 375 | 187.5 | 200 | EE | 1⅛ | 2⅜ | 1⅛ | 5/16 | 1.00 |

### OPEN AND VERTICAL SHIELDED TYPES / dc to ac

| Type No. | Primary D.C. | Secondary | Case Type | Dimensions—Inches H | W | D | Mounting Dimensions MW | MD | Weight Lbs. |
|---|---|---|---|---|---|---|---|---|---|
| TY-46A | 28 | 110-115-125v 400cps 60 watts | L | 1⅛ | 2¼ | 2 | 1⅛ | 1⅛ | ½ |
| TY-46Z | 12 | 110-115-125v 400cps 60 watts | L | 1⅛ | 2¼ | 2 | 1⅛ | 1⅛ | ½ |
| TY-75A | 12 | 110-115-125v 60cps 115 watts | A | 3⅛ | 3 5/32 | 3½ | 2½ | 2⅜ | 5 |
| TY-76A | 12 | 110-115-125v 60cps 60 watts | A | 3 5/16 | 2 21/32 | 2⅜ | 2 | 1 11/16 | 3 |

### OPEN TYPE / 12 volt dc to dc

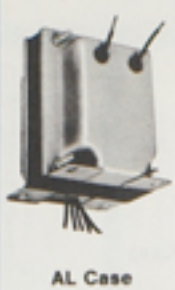
| Type No. | D.C. volts out of Rectifier F.W. Bridge | F.W.C.T. | D.C. Milliamperes Maximum | Dimensions—Inches H | W | D | MW | Weight Lbs. |
|---|---|---|---|---|---|---|---|---|
| TY-68S | 250 | 125 | 65 | 1⅝ | 1⅝ | 1 11/32 | 1½ | .2 |
| TY-69S | 300 | 150 | 100 | 1⅝ | 2⅜ | 1⅛ | 1½ | .5 |
| TY-70S | 325 | 162.5 | 150 | 2 | 2⅜ | 2 1/16 | 1½ | .6 |
| TY-71S | 375 | 187.5 | 200 | 2 | 2⅜ | 2 1/16 | 1½ | .65 |
| TY-74S | 600 | 300 | 200 | 2 | 4⅛ | 3 | 3⅜ | 1.07 |
| TY-77S† | 670 | 335 | 180 | 2 | 4⅛ | 3 | 3⅜ | 1.07 |

### OPEN TYPE / dc to dc converter

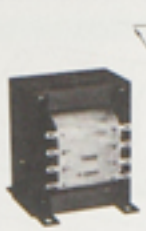
| Type No. | *Typical operation Input | Output | Case Type | Dimensions—Inches H | W | D | MW | Weight Lbs. |
|---|---|---|---|---|---|---|---|---|
| TY-200X | 3 v.DC @ 20 ma. | 1050 v.DC @ 25 μa. | X | 1 3/16 | 1⅛ | ⅜ | 1⅛ | .08 |
| TY-201TZ | 4 v.DC @ 15 ma. | 500 v.DC @ 50μa. | TZ | 1 1/16 | ⅛ | 1 1/16 | — | .015 |
| TY-202X | 4 v.DC @ 45 ma. | 550 v.DC @ 80 μa. | X | 1 3/16 | 1⅛ | ⅜ | 1⅛ | .08 |

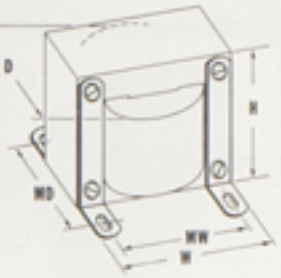
*May vary with circuit components, load requirements, etc. †Has additional winding for bias in SSB transmitters. Replacement for Triad-Utrad Nos. 5965 and 6278.

X Case



AL Case





U Case

## SMOOTHING FILTER REACTORS

| Type No. | Current DC MA. | Inductance†† Henries | Resistance Ohms | RMS Test Voltage | Case Type | Connections | Lead Holes Used | Case Dimension H | W | D | Mounting Dimensions MW | MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-85X | 10 | 1.5 | 70 | 2500 | X | Leads | - | 1¼ | 2⅛ | 1⅛ | 1¾ | | ⅜ | .4 |
| C-2X | 15 | 2 | 70 | 1500 | X | Leads | - | 1 5/16 | 2 1/16 | 1¼ | 1¾ | | ⅜ | .21 |
| C-30X | 15 | 50 | 3500 | 1500 | X | Leads | - | 1⅜ | 2⅜ | 1½ | 2 | | ⅜ | .42 |
| C-1X | 20 | 15 | 1000 | 1000 | X | Leads | - | 1 5/16 | 2 1/16 | 1¼ | 1¾ | | ⅜ | .21 |
| C-84X | 30 | 12 | 400 | 1500 | X | Leads | - | 1⅜ | 2⅜ | 1⅜ | 2 | | ⅜ | .5 |
| C-3X | 50 | 10 | 500 | 1500 | X | Leads | - | 1⅜ | 2 3/16 | 1½ | 2⅜ | | ⅜ | .6 |
| C-4X | 50 | 4 | 360 | 1500 | X | Leads | - | 1⅜ | 2⅜ | 1⅜ | 2 | | ⅜ | .35 |
| C-6X | 65 | 5 | 330 | 1500 | X | Leads | - | 1⅜ | 2 3/16 | 1½ | 2⅜ | | ⅜ | .6 |
| C-5X | 75 | 12 | 390 | 1000 | X | Leads | - | 1 5/16 | 3 1/16 | 1¾ | 2 1/16 | | ⅜ | 1 |
| C-8X | 75 | 7 | 240 | 1500 | X | Leads | - | 1 5/16 | 3 1/16 | 1¾ | 2 1/16 | | ⅜ | 1 |
| C-7X | 90 | 10 | 270 | 1000 | X | Leads | - | 1 5/16 | 3 1/16 | 2 | 2 1/16 | | ⅜ | 1.3 |
| C-9X | 90 | 4 | 100 | 1500 | X | Leads | - | 1 5/16 | 3 1/16 | 1⅜ | 2 1/16 | | ⅜ | 1 |
| C-11X | 110 | 6 | 160 | 1500 | X | Leads | - | 2 3/32 | 3 1/16 | 2 | 3⅛ | | ⅜ | 1.5 |
| C-10X | 125 | 9 | 250 | 1000 | X | Leads | - | 2 3/32 | 3 1/16 | 2 | 3⅛ | | ⅜ | 1.6 |
| C-12A | 160 | 6 | 165 | 1500 | A | Leads | 1 | 2 5/32 | 2 1/32 | 2½ | 1¾ | 1¾ | ⅜×⅜ | 2 |
| C-12X | 160 | 6 | 165 | 1500 | X | Leads | - | 2 3/32 | 3 1/16 | 2⅛ | 3⅛ | | ⅜ | 1.75 |
| C-13X | 160 | 3 | 75 | 1500 | X | Leads | - | 2 3/32 | 3 1/16 | 2⅛ | 3⅛ | | ⅜ | 1.75 |
| C-14A | 200 | 6 | 150 | 1500 | A | Leads | 1 | 3 1/16 | 2 1/32 | 2⅜ | 2 | 1 1/16 | ⅜×⅜ | 2.5 |
| C-14X | 200 | 6 | 150 | 1500 | X | Leads | - | 2 5/32 | 4 | 2¼ | 3 1/16 | | ⅜ | 2.3 |
| C-16A | 200 | 10 | 150 | 2500 | A | Leads | 1 | 3⅛ | 2 1/32 | 3½ | 2¼ | 2⅜ | ⅜×⅜ | 4.5 |
| C-21X | 225 | 1.5 | 65 | 1500 | X | Leads | - | 1 5/16 | 3 1/16 | 1⅜ | 2 1/16 | | ⅜ | 1.1 |
| C-24X | 240 | 1 | 50 | 1500 | X | Leads | - | 1⅜ | 2 1/16 | 1½ | 2⅜ | | ⅜ | .75 |
| C-15A | 250 | 4 | 100 | 1500 | A | Leads | 1 | 3 1/16 | 2 1/32 | 2⅜ | 2 | 1 1/16 | ⅜×⅜ | 2.65 |
| C-15X | 250 | 4 | 100 | 1500 | X | Leads | - | 2 5/32 | 4 | 2¼ | 3 1/16 | | ⅜ | 2.3 |
| C-23X | 260 | 1.2 | 45 | 1500 | X | Leads | - | 1 5/16 | 3 1/16 | 2 | 2 1/16 | | ⅜ | 1.35 |
| C-27X | 290 | .7 | 30 | 1500 | X | Leads | - | 1⅜ | 2 1/16 | 1½ | 2⅜ | | ⅜ | .75 |
| C-36X | 300 | .5 | 30 | 1500 | X | Leads | - | 1⅜ | 2⅜ | 1½ | 2 | | ⅜ | .5 |
| C-17X | 300 | 1.5 | 40 | 1500 | X | Leads | - | 2 3/32 | 3 1/16 | 2 | 3⅛ | | ⅜ | 1.6 |
| C-18A | 300 | 8 | 110 | 2500 | X | Leads | 1 | 3⅛ | 3 5/32 | 3⅛ | 2½ | 2¾ | ⅜×⅜ | 6.3 |
| C-19A | 300 | 10 | 105 | 3000 | A | Leads | 1 | 4¼ | 3 15/32 | 4⅛ | 2¾ | 3 | ⅜×⅜ | 7.75 |
| C-34X | 350 | .6 | 35 | 1500 | X | Leads | - | 1⅜ | 2 1/16 | 1½ | 2⅜ | | ⅜ | .6 |
| C-28X | 350 | 1 | 35 | 1500 | X | Leads | - | 1 5/16 | 3 1/16 | 2 | 2 1/16 | | ⅜ | 1.35 |
| C-29X | 375 | 1.5 | 50 | 1500 | X | Leads | - | 2 3/32 | 3 1/16 | 2 | 3⅛ | | ⅜ | 1.6 |
| C-20A | 400 | 6 | 60 | 3000 | A | Leads | 1 | 4⅜ | 3 1/16 | 4½ | 3 | 3⅜ | ⅜×⅜ | 10.5 |
| C-22A | 500 | 10 | 65 | 3000 | A | Leads | 1 | 5 1/16 | 4½ | 5⅛ | 3½ | 4⅛ | ½×¾ | 16.5 |
| C-45AL | 500 | 10 | 65 | 5000 | AL | Leads | 2-Side | 5 1/16 | 4 15/32 | 5⅛ | 3½ | 4⅛ | ½×¾ | 17.75 |
| C-40X | 600 | .32 | 10 | 1500 | X | Leads | - | 1 5/16 | 3 1/16 | 2 | 2 1/16 | | ⅜ | 1.3 |
| C-47U | 1A/2A | .3/.075§ | 3/.75 | 1500 | U | Leads | - | 3½ | 2⅛ | 3 5/16 | 2¼ | 2 1/16 | ⅛×⅜ | 4.6 |
| C-56U | 2.0 | .035 | .79 | 1500 | U | Lugs | - | 2¼ | 2⅜ | 2 | 2 5/16 | 1¾ | ⅛×⅜ | 2 |
| C-48U | 2.5A/5A | .08/.02§ | .61/.155 | 1500 | U | Leads | - | 3 1/16 | 3 1/16 | 3 5/16 | 2½ | 3 1/16 | ⅛×⅜ | 6.75 |
| C-57U | 4.0A | .025 | .55 | 1500 | U | Lugs | - | 3½ | 3⅜ | 2¼ | 2 1/16 | 2⅛ | ⅜×⅜ | 3.5 |
| C-49U | 5A/10A | .032/.008§ | .19/.05 | 1500 | U | Leads | - | 4¼ | 3½ | 3⅜ | 2⅝ | 3 1/16 | ⅛×⅜ | 8 |
| C-58U | 8.0A | .01 | .15 | 1500 | U | Lugs | - | 3⅜ | 3⅜ | 3⅜ | 3⅜ | 2½ | ⅛×⅜ | 5.5 |
| C-59U | 12.5A | .01 | .10 | 1500 | U | Lugs | - | 3½ | 4⅜ | 3 | 3 5/16 | 2⅝ | ⅛×⅜ | 6.25 |
| C-80U | 20A/40A | .024/.006§ | .1/.025 | 1500 | U | Lugs | - | 5 1/16 | 4 5/16 | 5½ | 2⅝ | 4½ | ⅛×⅜ | 21.25 |
| C-60U | 22.5A | .005 | .06 | 1500 | U | Lugs | - | 3⅝ | 4½ | 4 5/16 | 3⅝ | 3½ | ⅛×⅜ | 12.75 |

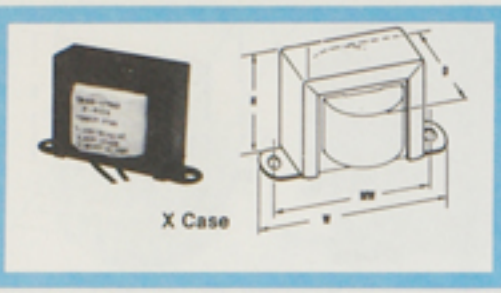
## SWINGING FILTER REACTORS

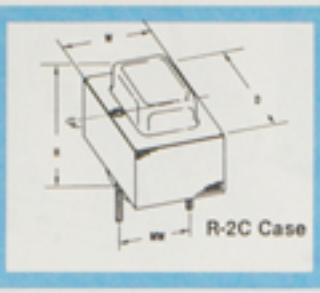
Triad's highly dependable Swinging Filter Reactors provide a swinging input reactance which substantially improves the regulation of high voltage power supplies and prevents DC voltage from rising to the maximum peak AC rectifier input.

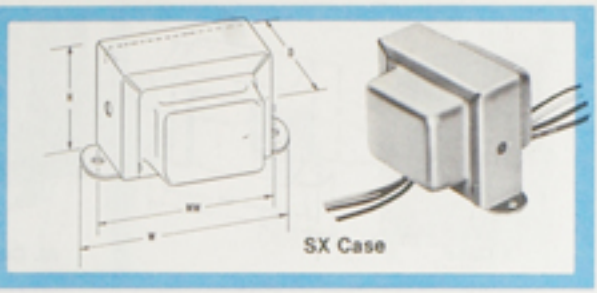
| Type No. | Current DC MA. | Inductance†† Henries | Resistance Ohms | RMS Test Voltage | Case Type | Connections | Lead Holes Used | Case Dimension H | W | D | Mounting Dimension MW | MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-31A | 20/200 | 25/5 | 150 | 2500 | A | Leads | 1 | 3 15/32 | 2 5/32 | 3½ | 2¼ | 2⅜ | ⅜×⅜ | 4.6 |
| C-33A | 30/300 | 25/5 | 105 | 3000 | A | Leads | 1 | 4¼ | 3 15/32 | 4⅛ | 2¾ | 3 | ⅜×⅜ | 7.6 |
| C-35A | 40/400 | 20/4 | 65 | 3000 | A | Leads | 1 | 4⅜ | 3 1/16 | 4½ | 3 | 3⅜ | ⅜×⅜ | 10.5 |

†† Inductance tolerance—20% + 50%  § Split winding.

# PLATE AND FILAMENT TYPES


X Case


R-2C Case


SX Case

## MULTI-PURPOSE TV AND STEREO

| Type No. | Secondary #1* | Secondary #2 | RMS Test Volts | Case Type | Connections | Case Dimensions H | W | D | MW | WT |
|---|---|---|---|---|---|---|---|---|---|---|
| F-170SX | 20 VCT @ .200 ADC | 6.3V @ .200A | 1500 | SX | Leads | 1⅝ | 2⅜ | 1⅛ | 2 | .40 |
| F-171SX | 26 VCT @ .200 ADC | 6.3V @ .200A | 1500 | SX | Leads | 2⅛ | 2 13/16 | 1 11/16 | 2⅜ | .50 |
| F-172SX | All 24 VCT @ .400 ADC | 6.3V @ .300A | 1500 | SX | Leads | 1⅝ | 2 13/16 | 1 13/16 | 2⅜ | .62 |
| F-173SX | Primaries 30 VCT @ .400 ADC | 6.3V @ .300A | 1500 | SX | Leads | 1⅝ | 2 13/16 | 1 13/16 | 2⅜ | .62 |
| F-174SX | 115 Volts 30 VCT @ .500 ADC | 6.3V @ .500A | 1500 | SX | Leads | 1 31/32 | 3¼ | 1 15/16 | 2 13/16 | 1.06 |
| F-175SX | 50/60Hz 44 VCT @ .400 ADC | 6.3V @ .500A | 1500 | SX | Leads | 1 31/32 | 3¼ | 2 5/32 | 2 13/16 | 1.25 |
| F-176SX | 40 VCT @ .800 ADC | 6.3V @ .500A | 1500 | SX | Leads | 2 5/32 | 3¼ | 2¼ | 3⅜ | 1.68 |
| F-177SX | 50 VCT @ .800 ADC | 6.3V @ 1.000A | 1500 | SX | Leads | 2 15/32 | 4 | 2 11/32 | 3 5/16 | 2.31 |
| F-178SX | 60 VCT @ .600 ADC | 6.3V @ 1.000A | 1500 | SX | Leads | 2 15/32 | 4 | 2 11/32 | 3 5/16 | 2.31 |
| F-179SX | 60 VCT @ 1.000 ADC | 6.3V @ 1.000A | 1500 | SX | Leads | 2 15/32 | 4 | 2 11/32 | 3 5/16 | 2.31 |

*Secondary #1 current rating with FWCT Rectifier.

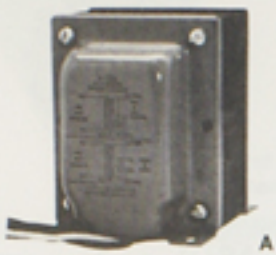
## FOR PREAMPLIFIERS, VTVM, ETC. / primary 115 volt, 50-60 Hz

| Type No. | Secondary AC Volts +5% | Secondary DC Ma Cond. Input | Secondary DC Ma Choke Input | Rectifier Filament Volts +5% | Rectifier Filament Amps | Other Filaments Volts +5% | Other Filaments Amps | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | W | D | Mounting Dimension MW | MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-68A‡ | 400-0-400 | 30 | 38 | 5 | 2 | 6.3* 6.3* | 1.2 1.2 | 2000 | A | 1 | 3 3/32 | 2 21/32 | 3⅛ | 2 | 2 5/16 | ⅜×⅝ | 3 |
| R-2C‡ | 135 | 15 | 19 | - | - | 6.3 | .9 | 1500 | C | Leads | 1⅝ | 1⅜ | 1 5/16 | - | 1¼ | — | 1 |
| R-23B‡ | 125-0-125 | 22 | 28 | - | - | 6.3 15.5-12.6 | .8 .6 | 1500 | B | 1 | 1⅝ | 2⅜ | 2 5/16 | 2 5/16 | 1⅜ | — | 1.75 |
| R-3A‡ | 250-0-250 | 20 | 25.5 | - | - | 6.3 CT | 2 | 1500 | A | 1 | 2 15/32 | 2 21/32 | 2½ | 1¾ | 1¾ | ⅜×⅝ | 1.75 |
| R-53Z | 250-0-250 | 25 | 32 | - | - | 6.3 | 1.0 | 1500 | Z | Leads | 2 5/16 | 2⅜ | 2 | 2⅜ | - | ⅝ | 1.0 |
| R-55Z# | 125-0-125 | 25 | 32 | - | - | 6.3 | 1 | 1500 | Z | Leads | 2 5/16 | 2⅜ | 1¾ | 2⅜ | - | ⅝ | 1.0 |
| R-29A‡ | 115-0-115 | 40 | 51 | - | - | 6.3 CT | 1.5 | 1500 | A | 1 | 2 15/32 | 2 21/32 | 2⅜ | 1¾ | 1⅜ | ⅜×⅝ | 1.75 |
| R-30X‡ | 135 | 50 | 64 | - | - | 6.3 | 1.5 | 1500 | X | Leads | 2 5/32 | 3⅜ | 2⅜ | 3⅜ | - | ⅝ | 1.5 |
| R-54X‡# | 115 | 15 | 19 | - | - | 6.3 | .6 | 1500 | X | Leads | 1⅜ | 2 1/16 | 1⅜ | 2⅜ | - | ⅝ | 1 |
| R-54Z | 115 | 15 | 19 | - | - | 6.3 | .6 | 1500 | Z | Leads | 1 15/16 | 2 5/16 | 1⅜ | 2 | - | ⅝ | 1 |
| R-56A‡ | 130 | 20 | 25 | - | - | 0-15-22.5-30 | .6 | 1500 | A | 2 | 2 15/32 | 2 21/32 | 2¾ | 1¾ | 2 | ⅜×⅝ | 2 |

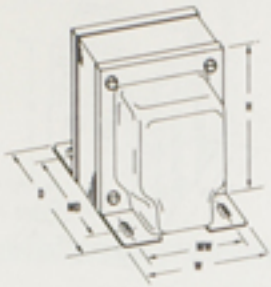
## COMBINED PLATE AND FILAMENT / primary 115 volt, 60 Hz

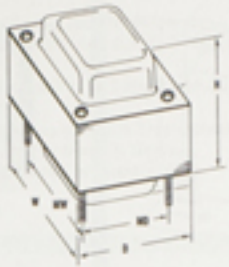
| Type No. | Secondary AC Volts +5% | Secondary DC Ma. Cond. Input | Secondary DC Ma. Choke Input | Rectifier Filament Volts +5% | Rectifier Filament Amps | Other Filaments Volts +5% | Other Filaments Amps | RMS Tests Volts | Case Type | Lead Holes Used | Case Dimension H | W | D | Mounting Dimension MW | MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-104A‡ | 250-0-250 | 40 | 51 | - | - | 6.3 CT | 2 | 1500 | A | 1 | 2 15/32 | 2 21/32 | 2¼ | 1¾ | 1½ | ⅜×⅝ | 1.55 |
| R-104B‡ | 250-0-250 | 40 | 51 | - | - | 6.3 CT | 2 | 1500 | B | 1 | 1½ | 2⅜ | 2 5/16 | 2 5/16 | 1⅜ | — | 1.55 |
| R-105A‡ | 300-0-300 | 65 | 82 | - | - | 6.3 CT | 2.7 | 1500 | A | 1 | 3 5/16 | 2 21/32 | 2½ | 2 | 1 5/16 | ⅜×⅝ | 2 |
| R-105B‡ | 300-0-300 | 65 | 82 | - | - | 6.3 CT | 2.7 | 1500 | B | 1 | 1⅜ | 3 | 2½ | 2½ | 2 | — | 2 |
| R-106A‡ | 240-0-240 | 50 | 63.5 | 5 | 2 | 6.3 CT | 2 | 1500 | A | 1 | 3 5/16 | 2 21/32 | 2⅜ | 2 | 1 5/16 | ⅜×⅝ | 2.1 |
| R-106B‡ | 240-0-240 | 50 | 63.5 | 5 | 2 | 6.3 CT | 2 | 1500 | B | 1 | 1½ | 3 | 2½ | 2½ | 2 | — | 2.1 |
| R-108A‡ | 250-0-250 | 75 | 95 | 5 | 2 | 6.3 CT | 2.5 | 1500 | A | 1 | 3 5/16 | 2 21/32 | 2⅜ | 2 | 1 11/16 | ⅜×⅝ | 2.4 |
| R-108B‡ | 250-0-250 | 75 | 95 | 5 | 2 | 6.3 CT | 2.5 | 1500 | B | 1 | 1⅜ | 3 | 2½ | 2½ | 2 | — | 2.4 |
| R-109A‡ | 300-0-300 | 75 | 95 | 5 | 2 | 6.3 CT | 3 | 1500 | A | 1 | 3½ | 2 21/32 | 2⅜ | 2¼ | 1⅜ | ⅜×⅝ | 2.9 |
| R-110A‡ | 262.5-0-262.5 | 90 | 115 | 5 | 2 | 6.3 CT | 5 | 1500 | A | 1 | 3½ | 2 21/32 | 3⅛ | 2¼ | 2 | ⅜×⅝ | 3.25 |
| R-110B‡ | 262.5-0-262.5 | 90 | 115 | 5 | 2 | 6.3 CT | 5 | 1500 | B | 1 | 1⅝ | 3⅜ | 2 13/16 | 2 13/16 | 2¼ | — | 3.25 |
| R-111A‡ | 350-0-350 | 90 | 115 | 5 | 3 | 6.3 CT | 3.5 | 1500 | A | 1 | 3½ | 2 21/32 | 3⅛ | 2¼ | 2 | ⅜×⅝ | 3.25 |
| R-111B‡ | 350-0-350 | 90 | 115 | 5 | 3 | 6.3 CT | 3.5 | 1500 | B | 1 | 1⅝ | 3⅜ | 2 13/16 | 2 13/16 | 2¼ | — | 3.25 |
| R-112A‡ | 275-0-275 | 110 | 140 | 5 | 2 | 6.3 CT | 5 | 1500 | A | 1 | 3½ | 2 21/32 | 3⅛ | 2¼ | 2⅜ | ⅜×⅝ | 3.7 |
| R-112B‡ | 275-0-275 | 110 | 140 | 5 | 2 | 6.3 CT | 5 | 1500 | B | 1 | 2 | 3⅜ | 2 13/16 | 2 13/16 | 2¼ | — | 3.7 |
| R-114A‡ | 350-0-350 | 125 | 160 | 5 | 3 | 6.3 CT | 4.5 | 1500 | A | 1 | 3⅝ | 3 5/32 | 3¼ | 2½ | 2⅝ | ⅜×⅝ | 4.7 |
| R-115A‡ | 340-0-340 | 70 | 89 | 5 | 2 | 6.3 CT | 2.5 | 1500 | A | 2 | 3 5/16 | 2 21/32 | 3 | 2 | 1 15/16 | ⅜×⅝ | 3.5 |
| R-116A‡ | 350-0-350 | 160 | 200 | 5 | 3 | 6.3 CT | 5 | 1500 | A | 1 | 3⅜ | 3 5/32 | 3¾ | 2½ | 2⅝ | ⅜×⅝ | 5.65 |
| R-118B‡ | 375-0-375 | 175 | 220 | 5 | 3 | 6.3 CT | 8 | 1500 | B | 1 | 2¾ | 4⅛ | 3 11/16 | 3 11/16 | 2¾ | — | 7.45 |
| R-120A‡ | 350-0-350 | 200 | 255 | 5 | 3 | 6.3 CT | 8 | 1500 | A | 1 | 4¼ | 3 15/32 | 4⅛ | 2¾ | 3 | ⅜×⅝ | 8.25 |
| R-121A‡ | 400-0-400 | 200 | 255 | 5 | 3 | 6.3 CT | 6 | 1500 | A | 1 | 4¼ | 3 15/32 | 4⅛ | 2¾ | 3¼ | ⅜×⅝ | 8.25 |

# PLATE AND FILAMENT TYPES



A Case





B Case

## COMBINED PLATE AND FILAMENT / primary 115 volt / 50-60 Hz

| Type No. | Secondary AC Volts ±5% | Secondary DC Ma. Cond. Input | Secondary DC Ma. Choke Input | Rectifier Filament Volts ±5% | Rectifier Filament Amps | Other Filaments Volts ±5% | Other Filaments Amps | RMS Test Volts | Case Type | Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting* Dimension MW | Mounting* Dimension MD | Max Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-4A | 250-0-250‡ | 40 | 51 | - | - | 6.3 CT | 2 | 1500 | A | 1 | 2 15/32 | 2 13/32 | 2⅝ | 1¾ | 1⅞ | 1.75 |
| R-5A | 300-0-300‡ | 65 | 82 | - | - | 6.3 CT | 2.7 | 1500 | A | 1 | 3 3/16 | 2 13/32 | 2⅝ | 2 | 1 11/16 | 2.75 |
| R-6A | 240-0-240‡ | 50 | 63.5 | 5 | 2 | 6.3 CT | 2 | 1500 | A | 1 | 3 3/16 | 2 13/32 | 2⅝ | 2 | 1 11/16 | 2.75 |
| R-7A# | 300-0-300‡ | 50 | 63.5 | 5 | 2 | 6.3 CT | 2 | 1500 | A | 1 | 3 3/16 | 2 13/32 | 2⅝ | 2 | 1 11/16 | 2.75 |
| R-22A# | 190-160-0-160-190‡ | 70 | 89 | - | - | 6.3 | .6 | 1500 | A | 1 | 3 3/16 | 2 13/32 | 2⅝ | 2 | 1 11/16 | 2.75 |
| | | | | — | — | 6.3 CT | 3 | | | | | | | | | |
| R-8A | 250-0-250‡ | 75 | 95 | 5 | 2 | 6.3 CT | 2.5 | 1500 | A | 1 | 3 3/16 | 2 13/32 | 3⅛ | 2 | 2 3/16 | 3 |
| R-9A | 300-0-300‡ | 75 | 95 | 5 | 2 | 6.3 CT | 3 | 1500 | A | 1 | 3½ | 2 13/32 | 3¼ | 2¼ | 2⅝ | 3.5 |
| R-10A | 262.5-0-262.5‡ | 90 | 115 | 5 | 2 | 6.3 CT | 5 | 1500 | A | 1 | 3½ | 2 13/32 | 3⅝ | 2¼ | 2½ | 4.5 |
| R-11A | 350-0-350‡ | 90 | 115 | 5 | 3 | 6.3 CT | 3.5 | 1500 | A | 1 | 3½ | 2 13/32 | 3⅝ | 2¼ | 2⅝ | 4.25 |
| R-11B | 350-0-350‡ | 90 | 115 | 5 | 3 | 6.3 CT | 3.5 | 1500 | B | 1 | 2½ | 3⅝ | 2 15/16 | 2 15/16 | 2¼ | 4.25 |
| R-12A | 275-0-275‡ | 110 | 140 | 5 | 2 | 6.3 CT | 5 | 1500 | A | 1 | 3¾ | 3 5/32 | 3⅜ | 2½ | 2¾ | 4.5 |
| R-14A | 350-0-350‡ | 125 | 160 | 5 | 3 | 6.3 CT | 4.5 | 1500 | A | 1 | 3¾ | 3 5/32 | 3¾ | 2½ | 2¾ | 6 |
| R-14B | 350-0-350‡ | 125 | 160 | 5 | 3 | 6.3 CT | 4.5 | 1500 | B | 1 | 2¾ | 3⅜ | 3⅜ | 3⅜ | 2½ | 6 |
| R-72A# | 400-0-400‡ | 140 | 178 | 5 | 3 | 6.3 CT | 4 | 1500 | A | 2 | 4¼ | 3 5/32 | 3⅜ | 2¾ | 2½ | 5.75 |
| R-16A | 350-0-350‡ | 160 | 200 | 5 | 3 | 6.3 CT | 5 | 1500 | A | 1 | 3¾ | 3 5/32 | 4⅛ | 2½ | 3⅛ | 7 |
| R-21A | 400-0-400‡ | 200 | 255 | 5 | 3 | 6.3 CT | 6 | 1500 | A | 2 | 4¼ | 3 15/32 | 4⅛ | 2¾ | 3⅜ | 9.25 |
| R-21B | 400-0-400‡ | 200 | 255 | 5 | 3 | 6.3 CT | 6 | 1500 | B | 1 | 3¾ | 4⅛ | 3 7/16 | 3 7/16 | 2¾ | 9.25 |
| R-71A# | 450-0-450‡ (2000V Test) | 250 | 317 | 5 (2000V Test) | 4 | 6.3 | 4 | 1500 | A | 2 | 4⅝ | 3 15/16 | 4⅞ | 3 | 3⅜ | 12 |
| | | | | | | 6.3 CT | 2 | | | | | | | | | |
| R-24A# | 400-0-400‡ | 300 | 380 | 5 | 6 | 6.3 CT | 6 | 1500 | A | 1 | 4⅝ | 3 15/16 | 4⅞ | 3 | 3⅜ | 14 |
| R-24B# | 400-0-400‡ | 300 | 380 | 5 | 6 | 6.3 CT | 6 | 1500 | B | 1 | 3¾ | 4½ | 3¾ | 3⅜ | 3 | 14 |
| R-25A | 400-0-400‡ | 500 | 635 | 5 | 6 | 6.3 CT | 7 | 2000 | A | 2 | 5 5/16 | 4½ | 5⅛ | 3½ | 4⅜ | 19 |
| | | | | | | 6.3 | 3 | | | | | | | | | |

*Mtg. Hole Size for "A" case types, ⅜×3/16 except R-25A; ½×¼.

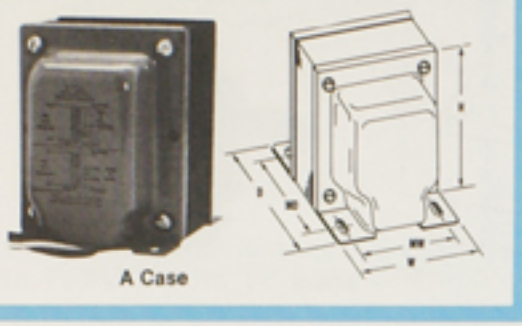
## SOLID STATE RECTIFIER POWER / primary 117 volts, 50-60 Hz

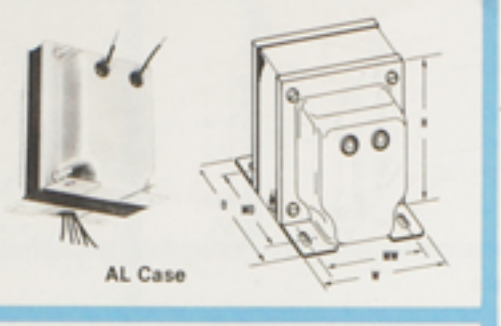
| Type No. | Secondary No. 1 Volts | Secondary No. 1 DC ma. | Secondary No. 2 Volts | Secondary No. 2 Amps | Secondary No. 3 Volts | Secondary No. 3 Amps | RMS Test Volts | Case Type | Connections | Case Dimensions H | Case Dimensions W | Case Dimensions D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit W Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-200A | 200-0-200 | 400 | 6.3 | 3 | 6.3 | 3 | 1500 | A | Leads | 4¼ | 3⅜ | 4⅛ | 2⅝ | 3 5/16 | ⅜×3/16 | 7.1 |
| R-201A | 150-0-150 | 600 | 6.3 | 2.5 | 6.3 | 2.5 | 1500 | A | Leads | 4¼ | 3⅜ | 4⅛ | 2⅝ | 3 5/16 | ⅜×3/16 | 7.1 |
| R-202A | 100-0-100 | 800 | 6.3 | 2 | 6.3 | 2 | 1500 | A | Leads | 4¼ | 3⅜ | 4 | 2⅝ | 2 15/16 | ⅜×3/16 | 6.9 |
| R-203A | 50-0-50 | 1600 | 6.3 | 1.5 | 6.3 | 1.5 | 1500 | A | Leads | 4¼ | 3⅜ | 3¾ | 2⅝ | 2 15/16 | ⅜×3/16 | 6.0 |
| R-82B | 35-0-35 | 3000 | - | - | - | - | 1500 | B | Leads | 2 15/16 | 3¾ | 4½ | 3¾ | 3 | — | 8.3 |
| R-208A | 40-0-40 | 1200 | - | - | - | - | 1500 | A | Leads | 3½ | 2 13/16 | 3⅜ | 2¼ | 2½ | ⅜×3/16 | 4.4 |
| R-204A | 40-0-40 | 2000 | 6.3 | 1.5 | 6.3 | 1.5 | 1500 | A | Leads | 4¼ | 3⅜ | 3⅜ | 2⅝ | 2 15/16 | ⅜×3/16 | 6.5 |
| R-209B | 30-0-30 | 3000 | - | - | - | - | 1500 | B | Leads | 4½ | 3¾ | 4⅛ | 3¾ | 3 | — | 10 |
| R-205A | 30-0-30 | 2500 | 6.3 | 1.5 | 6.3 | 1.5 | 1500 | A | Leads | 4¼ | 3⅜ | 3¾ | 2⅝ | 2 15/16 | ⅜×3/16 | 6.0 |
| R-206B | 27-0-27 | 1250 | - | - | - | - | 1500 | B | Leads | 2¼ | 3¾ | 3½ | 3⅜ | 2½ | — | 4.8 |

*Windings may be connected in series to obtain their combined voltage when properly phased. Current will be equal to the current of the lowest winding. Example: Two 6.3V windings @ 2A. in series would be 12.6V. @ 2A. Windings may also be connected in parallel to obtain the combined current. Example: Two 6.3V. windings @ 2A. in parallel would be 6.3V. @ 4A.

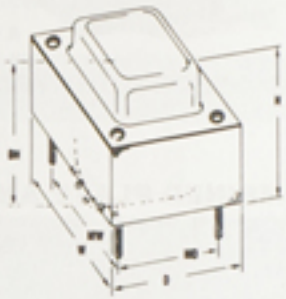
**CT** for Center Tap. ‡Static shield. #60 cycle operation.

# PLATE AND FILAMENT TYPES


A Case


AL Case


C Case



## CATHODE RAY TUBE / primary 115 volt, 50-60 Hz

| Type No. | Secondary AC Volts ±5% | DC Ma. Cond. Input | DC Ma. Choke Input | Rectifier Filament Volts ±5% | Rectifier Filament Amps | Other Filaments Volts ±5% | Other Filaments Amps | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-41C | 440-0-440<br>1250 | 125<br>5 | 158<br>- | 5<br>2.5*<br>2.5* | 3<br>1.75<br>1.75 | 6.3 | .6 | (2.5 V & 6.3V)—3500<br>Others—1500 | C | Lugs | 3¼ | 4⅝ | 3½ | 3⅛ | 2¾ | 7.5 |
| R-45C<br>• | 400-0-400<br>800 | 30<br>5 | 38<br>- | 5*<br>5* | 2<br>2 | 6.3<br>6.3 CT<br>6.3 | .6<br>3<br>1 | Pri. & 6.3 CT 1500<br>Others—3000 | C | Lugs | 2⅝ | 3¾ | 3⅛ | 3⅛ | 2½ | 4.5 |
| R-43C | 1600 | 3 | - | | | 0-2.5-5-6.3<br>0-2.5-5-6.3 | 1<br>3 | Pri.—1500<br>Others—4200 | C | Lugs | 2⅝ | 3¼ | 2⅞ | 2½ | 2 | 3.5 |
| R-83A●# | 400-0-400<br>650 | 70<br>3 | - | 125♦ | .3 | 6.3 CT<br>6.3 | 3.5<br>.6 | 6.3V 6A—3000<br>Others—1500 | A | 2-Sides | 3 15/32 | 2 11/32 | 3¾ | 2¼ | 2⅝ | 5 |
| R-84K●● | - | - | - | | | 6.3 | .6 | 3500 | K | 2-Sides | 2¾ | 2¼ | 2¾ | 2⅜ | 1½ | 1.5 |

●Direct Replacement For Power Transformer in Model 0-12 Heathkit Scope. ●●CRT Filament Transformer for Heathkit Model OP-1 Scope. #60 Cycle operation. ‡Static shield.

*Windings may be connected in series to obtain their combined voltage when properly phased. Current will be equal to the current of the lowest winding. Example: Two 6.3 V. windings @ 2A. in series would be 12.6V. @ 2A. Windings may also be connected in parallel to obtain the combined current. Example: Two 6.3V. windings @ 2A. in parallel would be 6.3V. @ 4A.

♦2 ohms 2W resistor in series with filament when IV2 is used.

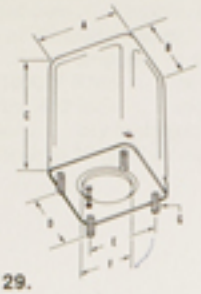
## REGULATED POWER SUPPLY / primary 115 volt, 50-60 Hz

| Type No. | Secondary†† AC Volts ±5% | DC Ma. Cond. Input | DC Ma. Choke Input | Rectifier Filament Volts ±5% | Rectifier Filament Amps | Other Filaments Volts ±5% | Other Filaments Amps | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-70A‡ | 440-0-440 | 59 | 75 | 6.3<br>6.3 | .6<br>.3 | 6.3<br>6.3 | .9<br>3 | 2000 | A | 1 | 3 1/16 | 3 5/32 | 3⅜ | 2½ | 2¼ | 4.5 |
| R-26A‡ | 440-360-0-360-440 | 157 | 200 | 5 | 3 | 6.3 CT<br>6.3<br>6.3 | 8<br>3<br>1 | 2000 | A | 1 | 4⅜ | 3 1/16 | 4⅜ | 3 | 3 1/16 | 12 |

## PLATE POWER / primary 115 volt, 50-60 Hz

| Type No. | Primary AC Volts | Secondary AC Volts†† ±5% | Secondary DC MA—Choke Input CCS | Secondary DC MA—Choke Input ICAS | Rectifier Filament Volts ±5% | Rectifier Filament Amps | RMS Test Voltage | Case Type | Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-1A‡ | 115 | 220-110-0-110-220 | 160 | 192 | 5 | 3 | 1500 | A | 1 | 3 1/32 | 2 11/32 | 3¼ | 2¼ | 2⅛ | 4 |
| P-3A‡ | 115 | 300-150-0-150-300 | 300 | 360 | 5 | 4 | 1500 | A | 1 | 3⅛ | 3 5/32 | 3⅛ | 2½ | 2⅝ | 6.25 |
| P-5A‡# | 115 | 550-0-550 | 250 | 300 | 5 | 4 | 2500 | A | 1 | 4⅛ | 3 1/16 | 3⅛ | 3 | 2⅛ | 8 |
| P-7A‡# | 115 | 617.5-0-617.5 | 250 | 300 | 5 | 4 | 2500 | A | 1 | 4⅛ | 3 1/16 | 4⅛ | 3 | 3⅛ | 9 |
| P-11A‡# | 115 | 727.5-0-727.5 | 250 | 300 | - | - | 2500 | A | 1 | 4⅛ | 3 1/16 | 3⅛ | 3 | 2⅛ | 8.5 |
| P-14A‡† | 115 | 890-712.5-0-712.5-890 | 250 | 300 | - | - | 3000 | A | 2 | 5 1/16 | 4½ | 4⅛ | 3½ | 3⅜ | 13.5 |
| P-215AL‡ | 115-230 | 1170-0-1170 | 250 | 300 | - | - | 3500 | AL | 1 + 2□ | 5 1/16 | 4½ | 4⅛ | 3½ | 3⅜ | 13.5 |
| P-217AL‡ | 115-230 | 1440-0-1440 | 250 | 300 | - | - | 4000 | AL | 1 + 2□ | 5 1/16 | 4½ | 4⅛ | 3½ | 3⅜ | 14.75 |
| PR-21AL‡# | 115-230 | 1650-0-1650 | 500 | 600 | - | - | 4500 | AL | 1 + 2□ | 6½ | 5½ | 6¼ | 4¼ | 4¼ | 29 |

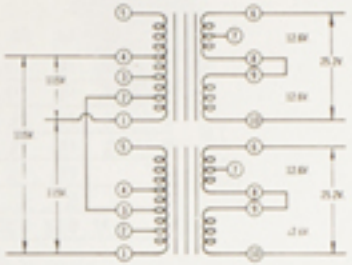
HS & HSM Case
See case chart, page 29.



Schematic for Scott Connection

using two HS-442's
Primary 115V. 400 C.P.S. 3 Phase
to
2 Phase 25.2V. or 2 Phase 12.6V.

Secondaries on each Transformer
can be used in Series,
Parallel or Separately



## FILAMENT / 50-60 Hz

| Type No. | Mil Type No. | Primary Volts | Filaments Volts | Filaments Amps | RMS Test Voltage | F. Dim. Inches | Mil Case Type | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|
| HSM-223 | TF4RX01YY | 115 | 6.3 | .6 | 1500 | ⅛ | AJ-2 | .75 |
| HSM-229 | TF4RX01JB | 0-105-115-125 | 6.3 CT | 8 | 2500 | 1 1/16 | JB | 5 |
| HSM-230 | TF4RX01FA | 0-105-115-125 | 24 CT | .8 | 1500 | ⅛ | FA | 2 |
| HSM-240 | TF4RX01GA | 0-115-230 | 12.6 CT*<br>12.6* | 1.5<br>1.5 | 2500 | 1⅜ | GA | 3.25 |
| HSM-236 | TF4RX01JB | 0-105-115-125 | 12.6 CT*<br>12.6* | 2<br>2 | 2500 | 1⅜ | JB | 6.5 |
| HSM-228 | TF4RX01JA | 0-105-115-125 | 6.3 CT*<br>6.3* | 6<br>6 | Pri. 1500<br>Sec. 2500 | 1⅜ | JA | 6.3 |
| HSM-231 | TF4RX01JB | 0-105-115-125 | 6.3 CT<br>5 CT | 5<br>3 | 2500 | 1⅜ | JB | 4.9 |

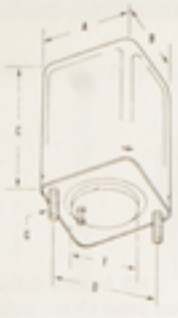
## ISOLATION / 50-60 Hz

| Type No. | Mil Type No. | Primary Volts | Secondary Volts | Secondary Current | Secondary VA | RMS Test Voltage | F. Dim. Inches | Mil Case Type | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|
| HSM-271 | TF4RX01KA | 115/230 | 0-105-115-125 | 1A. | 125 | 1500 | ⅛ | KA | 9.25 |

## LOW VOLTAGE / 50-60 Hz / for solid state applications

| Type No. | Mil Type No. | Primary Volts | Secondary AC Volts* | Secondary RMS Amps | RMS Test Volts | DC Volts CT FW | DC Volts FW Bridge | Mil Case Type | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|
| HSM-250 | TF4SX02AJ | 115 | 8.25–40.5 | .07– .22 DC | 1500 | 6.6-24 | 6-53 | AJ | 13 oz. |
| HSM-251 | TF4SX02FA | 115 | 8.25–40.5 | .4 –1.2 DC | 1500 | 6.6-24 | 6-53 | FA | 2 |
| HSM-252 | TF4SX02HA | 115 | 8.25–40.5 | 1.0 –3.0 DC | 1500 | 6.6-24 | 6-53 | HA | 4.5 |

| | AH | AJ | EA | EB | FA | GA | HA | JA | JB | KA |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 5/16 | 1 5/8 | 1 13/16 | 1 13/16 | 2 1/16 | 2 3/8 | 2 5/8 | 3 1/16 | 3 5/16 | 3 5/8 |
| B | 1 5/16 | 1 5/8 | 1 13/16 | 1 13/16 | 2 1/16 | 2 3/8 | 3 1/16 | 3 5/16 | 3 5/16 | 3 13/16 |
| C | 1 3/4 | 2 5/8 | 2 5/8 | 2 1/16 | 3 1/8 | 3 13/16 | 4 1/8 | 4 1/8 | 3 5/8 | 5 1/4 |
| D | 1 1/4 | 1 5/16 | 1 5/8 | 1 5/8 | 1 11/16 | 2 3/8 | 2 13/16 | 2 5/8 | 2 5/8 | 3 |
| E | | 1 5/16 | 1 1/4 | 1 1/4 | 1 1/16 | 1 3/8 | 1 13/16 | 2 1/8 | 2 1/8 | 2 1/4 |
| G | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 |
| I | 6-32 | 6-32 | 6-32 | 6-32 | 6-32 | 6-32 | 8-32 | 8-32 | 8-32 | 10-32 |



| | AJ-2 |
|---|---|
| A | 1 5/8 |
| B | 1 5/8 |
| Bw | |
| C | 2 5/8 |
| D | *1 5/8 |
| F | 3/8 |
| G | 6-32 |

AJ-2 Case

## COMBINED PLATE AND FILAMENT / primary 115 volt / 380-1500 Hz

| Type No. | Mil Type Number | Secondary Plate Supply | | | Filaments | | RMS Test Voltage | F. Dim Inches | Mil Case Type | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | A.C. Volts | D.C. Ma. Cond. In | D.C. Ma. Choke In | Volts | Amps | | | | |
| HS-401 | TF4RX03EB | 250-0-250‡ | 40 | 51 | 6.3 CT*<br>6.3* | 1<br>1 | 1500 | 3/8 | EB | 1.2 |

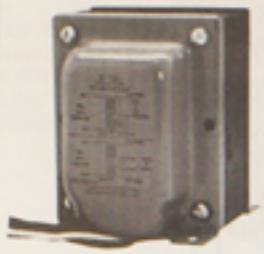
## ISOLATION / primary 115 volt / 380-1500 Hz

| Type No. | Mil Type No. | Secondary | | | RMS Test Voltage | F. Dim Inches | Mil Case Type | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|
| | | Volts | Current | VA | | | | |
| HS-470‡ | TF4RX01EA | 115 | .35A. | 40 | 1500 | 3/8 | EA | 1.5 |
| HS-472‡ | TF4RX01GA | 115 | 1.39A. | 160 | 1500 | 3/8 | GA | 3.1 |
| HS-475‡ | TF1RX01KA | 115 | 4.4A. | 500 | 1500 | 3/8 | KA | 8.75 |

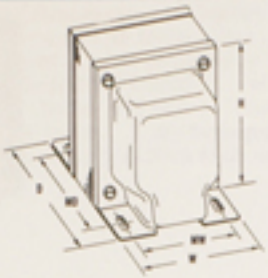
## FILAMENT / 380-1500 Hz

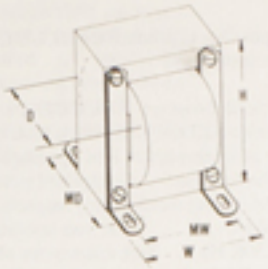
| Type No. | Mil Type No. | Volts Primary | Filaments | | RMS Test Voltage | F. Dim Inches | Mil Case Type | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|
| | | | Volts | Amps | | | | |
| HS-436 | TF4RX01AH | 115 | 6.3 CT | 1 | 1500 | 21/32 | AH | .3 |
| HS-425 | TF4RX01YY | 0-105-115-125 | 6.3 CT | 2 | 1500 | 3/8 | AJ-2 | .65 |
| HS-427 | TF4RX01EA | 0-105-115-125 | 6.3 CT | 5 | Pri. 500<br>Sec. 2500 | 3/8 | EA | 1.12 |
| HS-438 | TF4RX01EA | 0-105-115-125 | 24 CT | 1.5 | 1500 | 3/8 | EA | 1.2 |
| HS-441 | TF4RX01HA | 0-105-115-125 | 5 CT*<br>5*<br>2.5 CT | 10<br>10<br>10 | 2000<br>7500 | Special | HA | 4 |
| HS-443 | TF4RX01YY | 0-105-115-125 | 12.6 CT*<br>12.6* | .8<br>.8 | 1500 | 3/8 | AJ-2 | .75 |
| HS-442<br>For Scott connection | TF4RX01EA | 0-57.5-99.7-115-120 | 12.6 CT*<br>12.6* | 2<br>2 | 1500 | 3/8 | EA | 1.25 |
| F-439U | | 115 | 26 | 3.85 | 2000 | (Dim.) 3 3/4H 2 1/2W 2 1/2D | Spl (Non-Mil) | 2.25 |
| HS-444<br>For Scott connection | TF4SX01FA | 0-57.5-99.7-115-120 | 26 CT*<br>26 CT* | 2<br>2 | 2000 | .9 | FA | 1.9 |
| HS-440 | TF1RX01EA | 0-105-115-125 | 32 | 1.50 | 1500 | 3/8 | EA | 1.25 |

*Windings may be connected in series to obtain their combined voltage when properly phased. Current will be equal to the current of the lowest winding. Example: Two 6.3V. windings @ 2A. in series would be 12.6V. @ 2A. Windings may also be connected in parallel to obtain the combined current. Example: Two 6.3V. windings @ 2A. in parallel would be 6.3V. @ 4A. †Tapped for 5-Volt rectifier use. **CT** for Center Tap. ‡Static shield.



A Case





U Case

## REPLACEMENT PUSH-PULL OUTPUT / push-pull tubes to voice coil / 3-4 ohms

| Type No. | Output Watts | Primary D.C. Ma Total | Primary D.C. Ma Each Side | Matching Impedance Primary | Matching Impedance Secondary | D.C. Resistance Primary | D.C. Resistance Secondary | Overall Turns Ratio | RMS Test Voltage | Case Type | Case Dimensions H | Case Dimensions W | Case Dimensions D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-39X | 3-4 | 60 | 30 | 12,000 CT | 3-4 | 750 | .46 | 54.6:1 | 1500 | X | 1⅝ | 2⅜ | 1⅝ | 2 | | ¼ | .45 |
| S-64X | 4-6 | 80 | 40 | 6000 CT | 3-4 | 550 | .35 | 42.5:1 | 1500 | X | 1⅝ | 2⅜ | 1½ | 2 | | ¼ | .5 |
| S-15X | 7-10 | 70 | 35 | 10,000 CT | 3-4 | 785 | .32 | 53.7:1 | 1000 | X | 1⅝ | 2 13/16 | 1½ | 2⅜ | | ¼ | .6 |
| S-19Z | 10-14 | 100 | 50 | 10,000 CT | 3-4 | 755 | .33 | 53.7:1 | 1000 | Z | 2¾ | 2⅜ | 2 | 2⅜ | | ¼ | 1.3 |
| S-68Z | 15-18 | 180 | 90 | 3400 CT (3000 CT/3800 CT) | 3-4 | 135 | .29 | 29.1:1 | 1500 | Z | 2 15/32 | 3⅛ | 2 | 2 13/16 | | ¼ | 1.6 |
| S-69Z | 15-18 | 120 | 60 | 5000 CT | 3-4 | 230 | .31 | 35.4:1 | 1500 | Z | 2 15/32 | 3⅛ | 2 | 2 13/16 | | ¼ | 1.6 |

## UNIVERSAL OUTPUT / single or push-pull tubes to voice coil

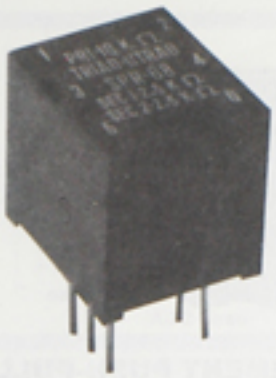
| Type No. | Output Watts | Application | Primary D.C. Ma P.P. Total | Primary D.C. Ma Single Total | Matching Impedance Primary | Matching Impedance Secondary | Total D.C. Resistance Primary | Total D.C. Resistance Secondary | Overall Turns Ratio | RMS Test Voltage | Case Type | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-62X | 2 | Single or P.P. Plates | 60 | 30 | 2000 to 10,000 | .64 to 26.3 | 440 | .79 | 25:1 | 1500 | X | 1 5/16 | 2 1/16 | 1¼ | 1¾ | .21 |
| S-51X | 5 | Single or P.P. Plates | 70 | 35 | 4000 to 14,000 | .04 to 89.6 | 420 | .98 | 25:1 | 1000 | X | 1⅝ | 2⅜ | 1⅝ | 2 | .45 |
| S-63X | 6 | Single or P.P. Plates | 100 | 50 | 1500 to 7000 | .5 to 28.6 | 240 | .745 | 18.7:1 | 1500 | X | 1⅝ | 2⅜ | 1⅝ | 2 | .45 |
| S-54X | 8 | Single | | 70 | 1500 to 5000 | .535 to 15.6 | 182 | .835 | 17.9:1 | 1500 | X | 1⅝ | 2 13/16 | 1½ | 2⅜ | .6 |
| S-53X | 8 | Single or P.P. Plates | 80 | 40 | 4000 to 14,000 | .04 to 89.6 | 340 | .83 | 24.9:1 | 1000 | X | 1⅝ | 2 13/16 | 1½ | 2⅜ | .6 |
| S-55X | 10 | P.P. Plates | 100 | | 4000 to 14,000 | .04 to 89.6 | 427 | 1.04 | 24.9:1 | 1000 | X | 1 15/16 | 3 5/16 | 1⅞ | 2 13/16 | 1 |
| S-55Z | 10 | P.P. Plates | 100 | | 4000 to 14,000 | .04 to 89.6 | 427 | 1.04 | 24.9:1 | 1000 | Z | 2 5/16 | 2⅞ | 1⅞ | 2⅜ | 1 |
| S-56Z | 12 | Single | | 85 | 1500 to 6000 | .35 to 24 | 125 | .7 | 15.8:1 | 1500 | Z | 2 15/32 | 3⅛ | 2 | 2 13/16 | 1.6 |
| S-57Z | 15 | P.P. Plates | 110 | | 4000 to 14,000 | .04 to 89.6 | 456 | 1.76 | 25:1 | 1000 | Z | 2 15/32 | 3⅛ | 2 | 2 13/16 | 1.6 |
| S-61Z | 20 | P.P. Plates | 125 | | 4000 to 12,000 | 1.5 to 20.2 | 200 | .7 | 19.85:1 | 1500 | Z | 2 15/32 | 3⅛ | 2⅛ | 2 13/16 | 1.8 |

## OUTPUT / line to voice coil

| Type No. | Output Watts | Application | Matching Impedance Primary | Matching Impedance Secondary | D.C. Resistance Primary | D.C. Resistance Secondary | Primary Ma. D.C. Per Side | Overall Turns Ratio | Frequency Response ± 3 DB | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-23X | 3 | Lo Imp. Line to Speaker Autoformer | 50 | 3.2-4 | 3.8 | .29 | - | 3.75:1 | 100-8000 | 1000 | X | Leads | 1 5/16 | 2 1/16 | 1¼ | 1¾ | | .21 |
| S-26X | 4 | Line to Speaker Autoformer | 500/50 | 3.2-4 | 28.8 | .3 | - | 11.2:1 | 100-8000 | 1000 | X | Leads | 1 5/16 | 2 1/16 | 1¼ | 1¾ | | .21 |
| S-66X | 3 | Line to Speaker Autoformer | 500 | 16/8/4 | 42 | 1.25 | - | 5.6:1 | 100-10,000 | 1000 | X | Leads | 1⅝ | 2⅜ | 1⅝ | 2 | | .45 |
| S-65X | 5 | Line to Speaker | 500 | 8/4 | 33.6 | .7 | - | 7.95:1 | 300-7000 | 500 | X | Leads | 1⅝ | 2⅜ | 1⅝ | 2 | | .45 |
| S-83Z | 25 | Line to Voice Coil | 500 | 15/8/6/4 | 24 | 1.0 | - | 5.75:1 | 50-15,000 | 1500 | Z | Lugs | 2⅜ | 2⅞ | 1⅝ | 2⅜ | | 1.0 |
| S-76Z | 10 | Variable Line to Speaker Matching Transformer | 250/125 62.5/31 | 16/8/4 | 30 | .67 | - | 3.92:1 | 40-15,000 | 1500 | Z | Lugs | 2 15/32 | 3⅛ | 2⅛ | 2 13/16 | | 1.8 |
| S-77U | 30 | High Level Line to Line or Speaker Matching Transformer | 500 CT/ 125 § | 32/16/8/4/2 | 36 | 2.05 | - | 3.96:1 | 40-15,000 | 1500 | U | Leads & Lugs | 3¾ | 2 13/16 | 4¾ | 2¼ | 3⅛ | 5 |

**CT** for Center Tap. § Split winding.

## BLUE CHIP TRANSFORMERS



Streamlined construction methods have made it possible to produce the **BLUE CHIP,** a low cost equivalent of the Triad **RED SPEC** transformer.

Reliability and performance have not been sacrificed, however. **BLUE CHIP** transformers have passed reliability testing side by side with **RED SPECS.** Each **BLUE CHIP** transformer has the same first rate performance as its respective Red Spec equivalent. Features include: Pin for pin compatability with the Red Spec . . . Gold plated nickel alloy leads . . . Constructed to meet MIL-T-27(D) . . . Mounting feet for ready inspection of all solder joints . . . Hermetically sealed epoxy molded case . . . 1000 volt insulation test voltage . . . Exceptional operation from 300 to 150K Hz . . . Base dimensions of .505 x .575 . . . Overall height .575 . . . Weight .25 oz . . . Dry hydrogen-annealed trialloy, deep drawn .020 inch case (SPR-310) available for providing as much as 20 to 45 dB magnetic shielding.

| Type No. | Application | Matching Impedance Primary | Matching Impedance Secondary | Max. ma DC Unbalanced In Primary | D.C. Resistance Pri. | D.C. Resistance Sec. | Frequency Response | Power Level @ ± 1.5 dB | Power Level @ ± 3 dB | Overall Turns Ratio | Fig. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SPR-4 | Input | 200,000 CT | 1,000 CT | 0 ma DC | 1800 | 38 | 300-60K | 10 mW | 12.5 mW | 14.1:1 | 3 |
| SPR-5 | Input | 50,000 CT | 1,000 CT | 0 ma DC | 900 | 53 | 300-125K | 25 mW | 30 mW | 7.06:1 | 3 |
| SPR-13 | Interstage | 25,000 CT/20,000 CT | 1,000 CT/800 CT | .6 ma DC | 690 | 100 | 350-125K | 50 mW | 60 mW | 5:1 | 3 |
| SPR-20 | Driver | 10,000 CT | 1,200 CT | 1 ma DC | 510 | 54 | 300-150K | 50 mW | 60 mW | 2.89:1 | 3 |
| SPR-21 | Driver | 10,000 CT | 2,000 CT | 1 ma DC | 480 | 100 | 300-150K | 50 mW | 60 mW | 2.24:1 | 3 |
| SPR-22 | Driver | 10,000 | 2,000 CT/500§ | 1 ma DC | 500 | 49/57 | 300-150K | 50 mW | 60 mW | 4.48:1:1 | 4 |
| SPR-29 | Driver | 10,000 CT | 500 CT | 1 ma DC | 510 | 20 | 300-150K | 50 mW | 60 mW | 4.48:1 | 3 |
| SPR-32 | Output | 500 | 50 | 4 ma DC | 37 | 2 | 300-150K | 50 mW | 60 mW | 3.49:1 | 1 |
| SPR-33 | Output | 1,000 | 50 | 3 ma DC | 63 | 2 | 300-150K | 50 mW | 60 mW | 4.5:1 | 1 |
| SPR-50 | Output | 500 CT | 600 | 4 ma DC | 26 | 36 | 300-150K | 50 mW | 60 mW | 1.1:1 | 2 |
| SPR-52 | Output | 1,500 CT | 600 | 2.6 ma DC | 76 | 36 | 300-150K | 50 mW | 60 mW | 1.58:1 | 2 |
| SPR-66 | Output-Isolation | 10,000 CT | 10 000 CT | 1 ma DC | 330 | 450 | 300-125K | 50 mW | 60 mW | 1:1 | 3 |
| SPR-67 | Output-Isolation | 600 CT | 600 CT | 4 ma DC | 29 | 36 | 300-150K | 50 mW | 60 mW | 1:1 | 3 |
| SPR-68 | Output-Isolation | 10,000 | 10,000 CT/2,500§ | 1 ma DC | 340 | 210/250 | 300-125K | 50 mW | 60 mW | 2:1:1 | 4 |
| SPR-69 | Output-Isolation | 600 | 600 CT/150§ | 4 ma DC | 28 | 17/19 | 300-150K | 50 mW | 60 mW | 2:1:1 | 4 |
| SPR-70 | Output-Isolation | 600 | 600 | 4 ma DC | 28 | 36 | 300-150K | 50 mW | 60 mW | 1:1 | 1 |
| SPR-310 | Shield | — | — | — | — | — | — | — | — | — | — |

CT for Center Tap §Split Secondary.

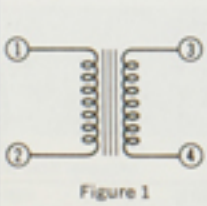


Figure 1

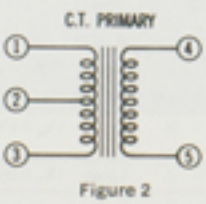



Figure 2

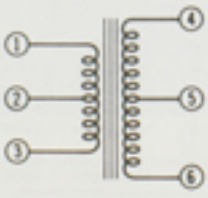



Figure 3

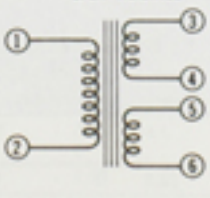
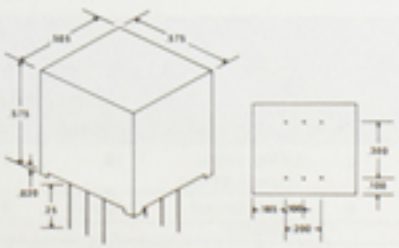
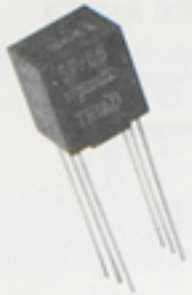



Figure 4



All Red Spec transformers are designed and constructed to conform to the rigid requirements of Specification MIL-T-27D. Features are: solid epoxy molded case . . . legible, permanent circuit data on every unit . . . base mounting pad for ready inspection of all solder joints . . . high-strength .020-diameter nickel alloy leads . . . all leads are gold plated . . . no stripping or tinning required . . . operating voltage: 150 volts DC . . . insulation test voltage 1000 V RMS . . . exceptional operation from 100 to 100,000 cycles . . . base dimensions of only .310 by .410 inch . . . total height of just .465 inch . . . weight: 1/16 ounce . . . lowest possible fatigue factor . . . dry hydrogen-annealed Trialloy, deep-drawn .020-inch case (SP-310) available for providing as much as 20 to 45 db magnetic shielding.



| Type No. | Mil Type Number | Power Level In MW | Application | Matching Impedance Primary | Matching Impedance Secondary | Max MA DC Unbalanced In Primary | DC Resistance Primary | DC Resistance Secondary | Overall Turns Ratio | Fig. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SP-4 | TF5S21ZZ | 10 | Input | 200,000 CT | 1,000 CT | 0 | 5300 | 100 | 14.1:1 | 3 |
| SP-5 | TF5S21ZZ | 25 | Input | 50,000 CT | 1,000 CT | 0 | 3800 | 75 | 7.1:1 | 3 |
| SP-7 | TF5S21ZZ | 10 | Input | 200,000 | 1,000 | 0 | 5300 | 100 | 14.1:1 | 1 |
| SP-11 | TF5S21ZZ | 40 | Interstage | 25,000/20,000 | 1,000/800 | .5 | 1700 | 115 | 5:1 | 1 |
| SP-13 | TF5S21ZZ | 40 | Interstage | 25,000 CT/20,000 CT | 1,000 CT/800 CT | .5 | 1700 | 115 | 5:1 | 3 |
| SP-15 | TF5S21ZZ | 50 | Interstage | 10,000 CT | 1,500 CT | 1 | 1050 | 300 | 2.57:1 | 3 |
| SP-20 | TF5S21ZZ | 50 | Driver | 10,000 CT | 1,200 CT | 1 | 1050 | 200 | 2.88:1 | 3 |
| SP-21 | TF5S21ZZ | 50 | Driver | 10,000 CT | 2,000 CT | 1 | 1050 | 330 | 2.24:1 | 3 |
| SP-22 | TF5S21ZZ | 50 | Driver | 10,000 | 2,000 CT/500§ | 1 | 1050 | 146/168§ | 4.48:1:1 | 4 |
| SP-29 | TF5S21ZZ | 50 | Driver | 10,000 CT | 500 CT | 1 | 1050 | 80 | 4.47:1 | 3 |
| SP-32 | TF5S21ZZ | 50 | Output | 500 | 50 | 3 | 60 | 8 | 3.16:1 | 1 |
| SP-33 | TF5S21ZZ | 50 | Output | 1,000 | 50 | 3 | 145 | 8 | 4.4:1 | 1 |
| SP-34 | TF5S21ZZ | 50 | Output | 600 | 3.2 | 3 | 70 | .76 | 13.6:1 | 1 |
| SP-35 | TF5S21ZZ | 50 | Output | 1,200 | 3.2 | 2 | 131 | .76 | 19.3:1 | 1 |
| SP-36 | TF5S21ZZ | 50 | Output | 10,000 | 3.2 | 1 | 1160 | .81 | 55.8:1 | 1 |
| SP-42 | TF5S21ZZ | 50 | Output | 150 CT | 12 | 10 | 18 | 2.7 | 3.54:1 | 2 |
| SP-47 | TF5S21ZZ | 50 | Output | 1,500 CT | 12 | 3 | 179 | 2.9 | 11.2:1 | 2 |
| SP-48 | TF5S21ZZ | 50 | Output | 7,500 CT | 12 | 1 | 796 | 2.9 | 25:1 | 2 |
| SP-49 | TF5S21ZZ | 50 | Output | 300 | 600 | 7 | 41 | 98 | 1:1.42 | 2 |
| SP-50 | TF5S21ZZ | 50 | Output | 500 CT | 600 | 3 | 67 | 98 | 1:1.1 | 2 |
| SP-51 | TF5S21ZZ | 50 | Output | 900 CT | 600 | 4 | 104 | 96 | 1.22:1 | 2 |
| SP-52 | TF5S21ZZ | 50 | Output | 1,500 CT | 600 | 3 | 168 | 92 | 1.58:1 | 2 |
| SP-65 | TF5S21ZZ | 50 | Output | 8,000 CT | 3.2 | 1 | 790 | .76 | 50:1 | 2 |
| SP-66 | TF5S21ZZ | 50 | Output-Isolation | 10,000 CT | 10,000 CT | 1 | 1000 | 1300 | 1:1 | 3 |
| SP-67 | TF5S21ZZ | 50 | Output-Isolation | 600 CT | 600 CT | 3 | 72 | 92 | 1:1 | 3 |
| SP-68 | TF5S21ZZ | 50 | Output-Isolation | 10,000 | 10,000 CT/2500§ | 1 | 1000 | 565/650§ | 2:1:1 | 4 |
| SP-69 | TF5S21ZZ | 50 | Output-Isolation | 600 | 600 CT/150§ | 3 | 72 | 40/45§ | 2:1:1 | 4 |
| SP-70 | TF5S21ZZ | 50 | Output-Isolation | 600 | 600 | 3 | 72 | 92 | 1:1 | 1 |
| SP-106 | TF5S20ZZ | — | Audio Choke | 6HY | — | 2 | 1700 | — | — | 5 |
| SP-107 | TF5S20ZZ | — | Audio Choke | 1.25HY | — | 2 | 180 | — | — | 5 |
| SP-108 | TF5S20ZZ | — | Audio Choke | 3.5HY | — | 2 | 1100 | — | — | 5 |
| SP-117 | TF5S20ZZ | — | Audio Choke | .9HY | — | 2 | 110 | — | — | 5 |
| SP-118 | TF5S20ZZ | — | Audio Choke | .3HY | — | 4 | 42 | — | — | 5 |
| SP-128 | TF5S20ZZ | — | Audio Choke | .1HY | — | 5 | 15 | — | — | 5 |
| SP-310 | — | — | Shield | — | — | — | — | — | — | — |

CT for Center Tap. §Split Secondary.

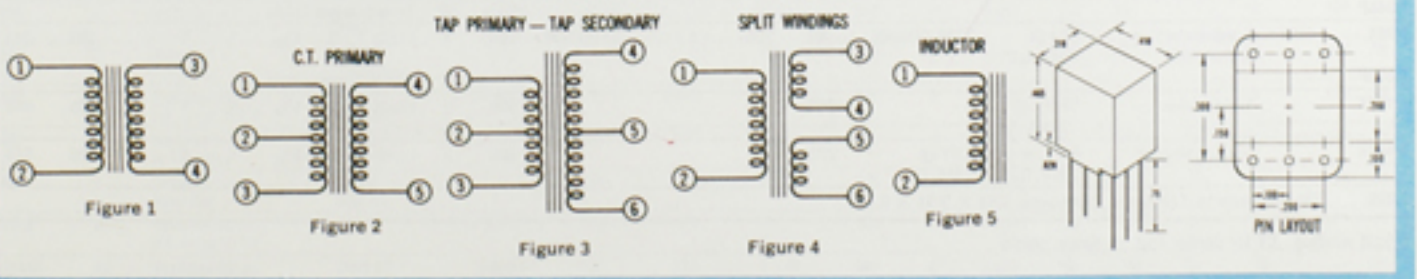
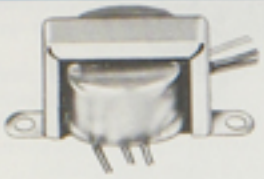



Figure 1 Figure 2 Figure 3 Figure 4 Figure 5

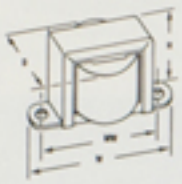
## MINIATURE AUDIO

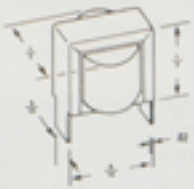
Highly dependable Triad Trijets are available as open frame units, or epoxy-molded for space saving and extreme reliability. Six of the most popular units in the T-series are encapsulated with plug-in terminals for printed circuit board use. All units have rigid tinned copper leads .750 long. A mu-metal case, No. T-300, may be slipped on any of these units to provide as much as 20 to 45 db magnetic shielding.

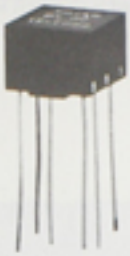


X Case

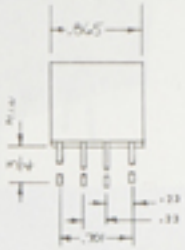

XT Case





SP Case



| Type No. | Power Output | Application | Matching Impedance Primary | Matching Impedance Secondary | DC Resistance Primary | DC Resistance Secondary | Overall Turns Ratio | Frequency Response ±3DB | RMS Test Volts | Case Type | Connections | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1X‡ | 1MW. | Line or Mike to Grid | 600/250/50 | 50,000 | 80 | 3200 | 1:9.16 | 60-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-1SP | | | | | | | | | | SP | Tinned Copper Leads | | | | | | |
| T-2X‡ | 1MW. | Line or Mike to Grid Hi Gain | 600/250/50 | 250,000 | 44 | 3600 | 1:20.6 | 100-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .100 | .045 |
| T-3X | 1MW. | Line or Mike to Single or P.P. Grids | 600/250/50 | 60,000 CT | 100 | 3600 | 1:10 | 60-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-5X‡ | 1MW. | Mike or Voice Coil to Grid | 30/12/4 | 50,000 | 7 | 3500 | 1:39.7 | 50-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-12X | 10MW. | Interstage-Plate to Single or P.P. Grids | 15,000 | 60,000 CT | 1350 | 2700 | 1:2 | 60-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-13X | 10MW. | Interstage-Plate to Single or P.P. Grids | 15,000 3 MA. D.C. | 95,000 CT | 1330 | 3300 | 1:2.5 | 350-7,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-20X | 10MW. | Output-Plate to Line | 15,000 | 600/250/50 | 1330 | 58 | 5:1 | 60-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-22X | 10MW. | Output-Plate to Line | 15,000 3 MA. D.C. | 600/250/50 | 1330 | 58.8 | 5:1 | 350-7,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-23X | 10MW. | Output-Single or P.P. Plates to Line | 20,000 CT | 600/250/50 | 2000 | 70 | 5.76:1 | 60-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .100 | .045 |
| T-23SP | | | | | | | | | | SP | Tinned Copper Leads | | | | | | |
| T-24X | 10MW. | Plate or Transistor to Transistor | 10,000 CT 2 MA. D.C. | 2000 CT | 1000 | 200 | 2.24:1 | 50-20,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .100 | .045 |
| T-25X | 10MW. | Plate to Line or Transistor | 12,000 CT 2 MA. D.C. | 600 CT/150§ | 1350 | 70 | 4.47:1 | 50-16,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-26X | 20MW. | Transistor to Line or Transistor | 50,000 CT .5 MA. D.C. | 600 CT/150§ | 2500 | 70 | 9.1:1 | 100-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-31X‡ | 10MW. | Line to Line | 600/250/50 | 600/250/50 | 55 | 80 | 1:1 | 50-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-31SP | | | | | | | | | | SP | Tinned Copper Leads | | | | | | |
| T-32X | 20MW. | Transistor to Transistor or Line | 1500 CT 2 MA. D.C. | 600 CT/150§ | 150 | 60 | 1.58:1 | 50-20,000 | 500 | X | Leads | ⅜ | 1 15/32 | 1 1/16 | 1 1/16 | .125 | .04 |
| T-33X‡ | 10MW. | Isolation-High Impedance | 5000 CT | 5000 CT | 1500 | 2200 | 1:1 | 60-15,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-41X | 1MW. | Transistor Driver-Single to Push-Pull | 1000 10 MA. D.C. | 200 CT | 428 | 128 | 2.25:1 | 20-15,000 | 500 | X | Leads | ⅜ | 1 15/32 | 1 1/16 | 1 1/16 | .125 | .04 |
| T-34X | 20MW. | Transistor or Line to Transistor or Line | 500 CT 2 MA. D.C. | 500 CT/125§ | 45 | 55 | 1:1.03 | 50-20,000 | 500 | X | Leads | ⅜ | 1 15/32 | 1 1/16 | 1 1/16 | .125 | .04 |
| T-34SP | | | | | | | | | | SP | Tinned Copper Leads | | | | | | |
| T-35X | 10MW. | Transistor or Line to Transistor | 600 CT 1 MA. D.C. | 2000 CT/500§ | 68 | 200 | 1:1.7 | 50-20,000 | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-35SP | | | | | | | | | | SP | Tinned Copper Leads | | | | | | |
| T-101X | - | Audio Choke | 50 HY @ .75 MA. D.C. | - | 4000 | - | - | - | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-102X | - | Coupling Reactor | 6 HY. or @ 3 MA. D.C. | 4 HY @ 6 MA. D.C. | 295 | - | - | - | 500 | X | Leads | ⅜ | 1 11/32 | ¾ | 1 | .096 | .045 |
| T-300 | Magnetic shield for T-SP series. Dimensions, 0.91 × 0.91 × 0.754 | | | | | | | | | | | | | | | | |

§ Split winding **CT** for Center Tap ‡ Static shield

## MINIATURE AUDIO TRANSISTOR TRANSFORMERS

Developed primarily for transistor circuitry, Triad miniatures can be applied with equal effectiveness in tube circuitry. Skillful design of these units permits the reversing of primary and secondary windings with virtually no loss in coupling characteristics. Power wattage given in the table is for lowest operating frequency; this wattage can be increased by as much as five times at the center of the frequency response curve. Frequency response will be equal to, or better than ± 3 db. 300-10,000.

| Type No. | Power Output Watts | Application | Matching Impedance Primary | Matching Impedance Secondary | DC Resistance Primary | DC Resistance Secondary | Overall Turns Ratio | RMS Test Volts | Case Type | Connections | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TY-19XT | .150 | Output-Single or P.P. to V.C. | 10000 CT | 16/8/4 | 1174 | 2.6 | 24.6:1 | 500 | XT | Leads | 21/32 | 1 3/4 | 3/8 | 7/32 | — | .65 |
| TY-22XT | .150 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 5000CT | 7500 CT | 650 | 790 | 1:1.22 | 500 | XT | Leads | 21/32 | 1 3/4 | 3/8 | 7/32 | — | .65 |
| TY-24X | .2 | Driver-Single to Sgl. or P.P. | 50000 .5MA D.C. | 3,000 CT | 3720 | 250 | 4.08:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-25X | .2 | Driver-Single to Sgl. or P.P. | 100000 .5MA D.C. | 200 CT | 9900 | 19.5 | 22.4:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-26X | .2 | Driver-Single to Sgl. or P.P. | 100000 .5MA D.C. | 3000 CT | 9880 | 318 | 5.78:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-27XT | .01 | Output-Single or P.P. to Line | 500 CT 2MA D.C. | 500 CT | 37.5 | 51.5 | 1:1 | 500 | XT | Leads | 3/8 | 9/16 | 3/8 | 9/16 | — | .025 |
| TY-28XT | .01 | Output-Single or P.P. to Line | 500 CT 2MA D.C. | 200 CT | 38.2 | 25 | 1.58:1 | 500 | XT | Leads | 3/8 | 9/16 | 3/8 | 9/16 | — | .025 |
| TY-32X | .2 | Interstage-Sgl. or P.P. to P.P. | 200 CT 2MA D.C. | 2000 CT | 29 | 233 | 3.16:1 | 1000 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-33X | .2 | Output-Single or P.P. to V.C. | 400 CT 5MA D.C. | 16/8/4 | 30 | 3 | 5:1 | 1000 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-34X | .2 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 400 CT 5MA D.C. | 2000 CT | 41 | 128 | 2.25:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-35X<br>TY-35XT | .1 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 500 CT 2MA D.C. | 150 CT | 57 | 32 | 1.82:1 | 500 | X<br>XT | Leads | 3/8 | 1 5/32 | 13/64 | 1 1/4<br>1 5/64 | .125 | .04 |
| TY-36X | .2 | Interstage-Sgl. to Sgl. or P.P. | 2000 2MA D.C. | 1500 CT | 165 | 140 | 1.15:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-37X<br>TY-37XT | .2 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 2000 CT 4MA D.C. | 8000 CT | 200 | 550 | 1:2 | 500 | X<br>XT | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8<br>1 1/4 | .120 | .08 |
| TY-38X | .2 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 3000 CT 4MA D.C. | 1000 CT | 263 | 105 | 1.74:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-39X | .2 | Output P.P. to V.C. | 4000 CT 4MA D.C. | 16/8/4 | 333 | 1.8 | 15.7:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-40X | .1 | Interstage-Sgl. to Sgl. or P.P. | 5000 1MA D.C. | 200 CT | 440 | 27 | 5:1 | 500 | X | Leads | 3/8 | 1 5/32 | 13/64 | 1 1/4 | .125 | .04 |
| TY-41X | .1 | Interstage Sgl. to Sgl. | 16000 1MA D.C. | 4000 | 1373 | 330 | 2:1 | 500 | X | Leads | 3/8 | 1 5/32 | 13/64 | 1 1/4 | .125 | .04 |
| TY-42X | .1 | Output-Sgl. to V.C. | 20000 .5MA D.C. | 8/4 | 1440 | 1.07 | 50:1 | 500 | X | Leads | 3/8 | 1 5/32 | 13/64 | 1 1/4 | .125 | .04 |
| TY-43X | .1 | Interstage-Sgl. to Sgl. or P.P. | 20000 .5MA D.C. | 800 CT | 1435 | 82 | 5:1 | 500 | X | Leads | 3/8 | 1 5/32 | 13/64 | 1 1/4 | .125 | .04 |
| TY-44X | .2 | Output-Sgl. to V.C. | 1000 10MA D.C. | 16/8/4 | 181 | 3.8 | 7.9:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-45X<br>TY-45XT | .2 | Output-Sgl. or P.P. to V.C. | 500 CT 5MA D.C. | 16/8/4 | 56 | 3.8 | 5.2:1 | 500 | X<br>XT | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8<br>1 1/4 | .120 | .08 |
| TY-46X | .25 | Interstage-Sgl. to P.P. or Sgl. | 100 100MA D.C. | 1000 CT | 5.5 | 60 | 1:3.15 | 1500 | X | Leads | 1 5/8 | 2 5/8 | 1 1/2 | 2 | 5/16 | .4 |
| TY-47X | .2 | Output-Sgl. or P.P. to V.C. | 2000 CT 10MA D.C. | 16/8/4 | 260 | 3.95 | 11.2:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-49X | .3 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 500 CT 12MA D.C. | 5000 CT | 40 | 245 | 1:3.15 | 500 | X | Leads | 1 5/8 | 2 5/8 | 1 5/8 | 2 | 5/16 | .4 |
| TY-51X<br>TY-51XT | .05 | Driver-Sgl. or P.P. to Sgl. or P.P. | 2000 CT 10MA D.C. | 200 CT | 748 | 120 | 3.16:1 | 500 | X<br>XT | Leads | 3/8 | 1 5/32 | 13/64 | 1 1/4<br>1 5/64 | .125 | .04 |
| TY-52X | .1 | Driver-Sgl. or P.P. to Sgl. or P.P. | 20000CT 1MA D.C. | 2000 CT | 2140 | 327 | 3.17:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-54X | .1 | Interstage-Sgl. to Sgl. or P.P. | 15000 1.5MA D.C. | 200 CT | 2130 | 55 | 8.65:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-55X | .2 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 2000 CT 2MA D.C. | 500 CT | 140 | 65 | 2:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-56X | .05 | Interstage-Sgl. to Sgl. or P.P. | 10000 1MA D.C. | 2000 CT | 1034 | 334 | 2.24:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-57X | .2 | Output-Sgl. or P.P. to V.C. | 250 CT 10MA D.C. | 16/8/4 | 34.6 | 3.7 | 3.94:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-58X | .2 | Output-Sgl. or P.P. to V.C. | 125 CT 15MA D.C. | 8/4 | 16 | 2.2 | 3.97:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-59X | .2 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 5000 CT 1MA D.C. | 50,000 CT | 378 | 6410 | 1:3.16 | 500 | X | Leads | 1 3/4 | 1 3/8 | 1 | 1 3/8 | .120 | .08 |
| TY-60X | .1 | Input-High Imp. to Transistor | 200000 0 D.C. | 1000 | 8400 | 195 | 14.2:1 | 500 | X | Leads | 3/8 | 1 5/32 | 13/64 | 1 1/4 | .125 | .04 |
| TY-62X | .1 | Output-Sgl. to Voice Coil | 10000 2MA D.C. | 4 | 709 | 1.5 | 50:1 | 500 | X | Leads | 3/8 | 1 5/32 | 13/64 | 1 1/4 | .125 | .04 |
| TY-150X | .3 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 500 CT | 500 CT | 40 | 55 | 1:1 | 500 | X | Leads | 1 3/4 | 1 3/8 | 3/8 | 1 3/8 | .125 | .12 |
| TY-151XT | .15 | Interstage-Sgl. or P.P. to Sgl. or P.P. | 5000 CT | 10000 CT | 635 | 825 | 1:1.41 | 500 | XT | Leads | 21/32 | 1 3/4 | 3/8 | 29/32 | | .05 |
| TY-17XT | | Filter Choke | 11 mhy @ 1ADC | | .75 | | | 1000 | XT | Leads | 1 5/8 | 2 3/4 | 1 1/4 | 1 3/8 | 3/4 | .21 |

## OUTPUT / low level

| Type No. | Output Watts | Application | Matching Impedance Primary | Matching Impedance Secondary | DC Resistance Primary | DC Resistance Secondary | Primary Ma. D.C. Per Side | Overall Turns Ratio | Frequency Response ± 3 DB | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A-53X | 2 | Single or P.P. Plates to Line | 18,000 CT | 600/250/50 | 1160 | 38 | 20 | 5.5:1 | 70-7000 | 1000 | X | Leads | 1⅜ | 2 13/16 | 1½ | 2⅜ | | ⅛ | .6 |
| S-58X | 1 | Line to Line | 600 CT/150 § | 600 CT/150§ | 46 | 47.2 | - | 1:1 | 100-10,000 | 500 | X | Leads | 1 5/16 | 2 1/16 | 1¼ | 1⅜ | | ⅛ | .21 |
| S-81X | 1 | Line to Line | 600 | 600 | 46 | 47.2 | - | 1:1 | 100-10,000 | 500 | X | Leads | 1 5/16 | 2 1/16 | 1¼ | 1⅜ | | ⅛ | .20 |
| S-84X | 10 | Line to Line | 500/333/200/125/50 | 500/333/200/125/50 | 21.7 | 23.8 | - | 1:1 | 50-20,000 | 1000 | X | Lugs | 2 | 3¼ | 1⅝ | 2 13/16 | | ⅛ | 1 |

## BULK-PACKED LINE— MATCHING TRANSFORMERS

These line matching transformers available in bulk only are the most reliable, easy-to-install and economical choice for use in efficient public address systems. Leads are color-coded for instant identification, and stripped and tinned for use with twist-on solderless connectors.

| Type No. | Output Watts | Secondary Impedance | Case Type | Dimensions—Inches H | W | D | MW | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|
| | | | | FOR 70.7-VOLT CONSTANT VOLTAGE LINE | | | | |
| S-7010 | 10/5/2.5 | 8 ohms | X | 1⅜ | 2⅜ | 1⅜ | 2⅜ | .50 |
| S-7005 | 5/2.5/1.25 | 8 ohms | X | 1⅜ | 2⅜ | 1⅜ | 2 | .37 |
| S-7002 | 2/1/0.5 | 8 ohms | X | 1⅜ | 2⅜ | 1⅜ | 2 | .37 |
| S-7001 | 1/0.63/0.32 | 8 ohms | X | 1 5/16 | 2 1/16 | 1⅛ | 1⅜ | .25 |
| | | | | FOR 25-VOLT CONSTANT VOLTAGE LINE | | | | |
| S-2510 | 10/5/2.5 | 8 ohms | X | 1⅜ | 2⅜ | 1⅜ | 2⅜ | .50 |
| S-2505 | 5/2.5/1.25 | 8 ohms | X | 1⅜ | 2⅜ | 1⅜ | 2 | .37 |
| S-2502 | 2/1/0.5 | 8 ohms | X | 1⅜ | 2⅜ | 1⅜ | 2 | .37 |
| S-2501 | 1/0.63/0.32 | 8 ohms | X | 1 5/16 | 2 1/16 | 1⅛ | 1⅜ | .25 |

## OUTPUT / 70.7 volt line in voice coil

| Type No. | Output Watts | Type | Secondary Impedance | D. C. Resistance Primary | D. C. Resistance Secondary | Freq. Resp. ±3 DB | RMS Test Voltage | Case Type | Case Dimension H | Case Dimension W | Case Dimension D | MW | MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-73X | 5/2.5/1.25/.625/.31 | Isolation | 16/8/4 | 838 | 1.17 | 40-15,000 | 1500 | X | 1⅜ | 2⅜ | 1⅜ | 2 | | ⅛ | .45 |
| S-70Z | 5/2.5/1.25/.625/.31 | Autoformer | 8/4 | 580 | .65 | 40-15,000 | 1000 | Z | 1 11/16 | 2 | 1⅜ | 1 23/32 | | ⅛ | .45 |
| S-47Z | 8/4/2/1/.5 | Isolation | 16/8/4 | 515 | .93 | 30-20,000 | 1500 | Z | 1 11/16 | 2⅜ | 1⅜ | 2 | | ⅛ | .67 |
| S-85X | 5/4/3/2/1 | Isolation | 16/8 | 320 | 1.5 | 50-20,000 | 1000 | X | 1⅜ | 2⅜ | 1⅜ | 2 | | ⅛ | .4 |
| S-78Z | 10/5/2.5/1.25 | Isolation | 16/8/4 | 157 | .84 | 40-20,000 | 1000 | Z | 1 11/16 | 2⅜ | 1½ | 2 | | ⅛ | .6 |
| S-86Z | 16/8/4/2/1/.5 | Isolation | 16/8/4 | 570 | 1.15 | 40-15,000 | 1000 | Z | 2⅛ | 3⅛ | 2¼ | 2 13/16 | | ⅛ | 1.5 |
| S-25Z | 10/5/2.5/1.25 | Autoformer | 8/4 | 120 | .475 | 30-20,000 | 1000 | Z | 2 1/16 | 2⅛ | 1⅜ | 2⅜ | | ⅛ | 1 |
| S-71Z | 10/5/2.5/1.25 | Autoformer | 16/8/4 | 148 | .835 | 40-20,000 | 1000 | Z | 1 11/16 | 2⅜ | 1½ | 2 | | ⅛ | .6 |
| SR-45Z | 10/5/2.5/1.25 | Autoformer | 16/8/4 | 267 | .866 | 20-20,000 | 1000 | Z | 2 23/32 | 3⅛ | 2⅛ | 2 13/16 | | ⅛ | 1.8 |
| S-79Z | 20/10/5/2.5 | Isolation | 16/8/4 | 69 | .7 | 40-20,000 | 1000 | Z | 2 1/16 | 2⅛ | 1⅜ | 2⅜ | | ⅛ | 1 |
| S-72Z | 20/10/5/2.5 | Autoformer | 16/8/4 | 56.5 | .5 | 40-20,000 | 1000 | Z | 2 1/16 | 2⅛ | 1⅜ | 2⅜ | | ⅛ | 1 |
| S-46A | 20/10/5/2.5 | Autoformer | 16/8/4 | 88.7 | .82 | 30-15,000 | 1000 | A | 3 1/16 | 2 11/32 | 3⅜ | 2 | 2 1/16 | ⅜×⅜ | 4 |
| S-43Z | 30/20/10/5 | Isolation | 16/8/4 | 40 | 1.0 | 40-20,000 | 1500 | Z | 2 1/16 | 2⅛ | 1⅜ | 2⅜ | | ⅛ | 1.6 |
| S-44Z | 50/40/25/15 | Isolation | 16/8/4 | 25 | 1.5 | 40-20,000 | 1500 | Z | 2 1/16 | 2⅛ | 2 | 2⅜ | | ⅛ | 1.5 |

## OUTPUT / 25 volt line to voice coil

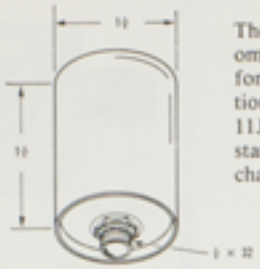
| Type No. | Output Watts | Type | Secondary Impedance | D.C. Resistance Primary | D.C. Resistance Secondary | Freq. Resp. ±3 DB | RMS Test Voltage | Case Type | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-131X | 2/1/.5 | Isolation | 8/4 | 63 | .67 | 50-20,000 | 1500 | X | 1⅜ | 2⅜ | 1⅜ | 2 | | ⅛ | .45 |
| S-132X | 5/2.5/1.25/.625 | Isolation | 16/8/4 | 37.6 | .76 | 30-20,000 | 1500 | X | 1⅜ | 2 1/16 | 1⅜ | 2⅜ | | ⅛ | .8 |
| S-133Z | 10/5/2.5/1.25 | Isolation | 16/8/4 | 12.5 | .66 | 20-20,000 | 1500 | Z | 2 23/32 | 3⅛ | 2 | 2 13/16 | | ⅛ | 1.6 |

## MATCHING / 25 or 70.7 volt line

| Type No. | Output Watts | Matching Impedance Primary | Matching Impedance Secondary | D.C. Resistance Primary | D.C. Resistance Secondary | Freq. Resp. ±3 DB | RMS Test Voltage | Case Type | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Mtg. Hole Size | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-129Z | 30 | 20.8 CT (25V. to 70V.)<br>166 CT (70V. to 25V.) | 166 CT<br>20.8 CT | 1.9 | 16.9 | 20-15,000 | 1500 | Z | 3 3/32 | 3⅛ | 2¼ | 3⅛ | | ⅛ | 2.3 |

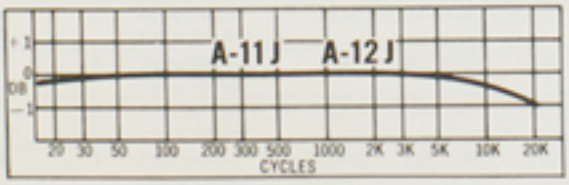
**CT** for Center Tap.

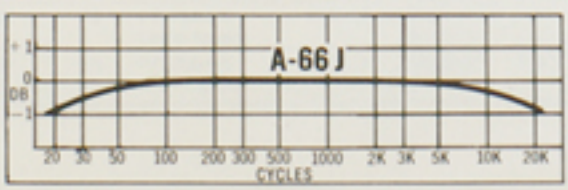
## J SERIES / low level high fidelity



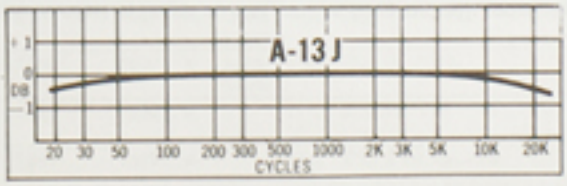
The flexibility of Triad J Series transformers permits amplifiers to exceed broadcast standards. Although economy in construction places them in a lower price class, these units approach and closely approximate the performance characteristics of more costly hermetically sealed units. Features: single-hole mounting, allowing rotation for maximum hum reduction . . . alloy shielding gives 40 to 60 db hum reduction (60 to 80 db in Types A-11J, A-12J, A-13J) . . . wide frequency ranges . . . flexible leads for ease of mounting . . . input units electrostatically magnetically shielded . . . light weight . . . smooth, baked enamel cases, 1¾" diameter, 1¾" above chassis . . . legible circuit diagrams permanently affixed to every case.

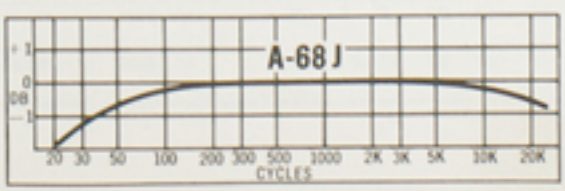
| Type No. | Power Output | Application | Matching Impedance Primary | Matching Impedance Secondary | D.C. Resistance Primary | D.C. Resistance Secondary | Overall Turns Ratio | Freq. Resp. ± 3DB | RMS Test Voltage | Case Type | Connections | Case H | Case D | Mtg. Hole Diameter | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A-9J‡ | 1MW | Line or Mike to Grid | 600/250/50 | 85,000 | 32.7 | 3450 | 1:12 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-10J‡ | 1MW | Balanced Line or Mike to Single Grid | 600 CT/150§§§ | 60,000 | 33.7 | 4040 | 1:10.5 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-11J‡ | 10MW | Line or Mike to Grid | 600/250/50 | 60,000 | 50 | 5000 | 1:10 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-12J‡ | 10MW | Balanced Line or Mike to Grid | 600 CT/150§§§ | 60,000 | 50 | 4920 | 1:10 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-13J‡ | 1MW | Line to Line or Transistor | 600/300/200 CT/ 110/50§§§ | 600 CT/ 150§§§ | 62 | 70 | 1:1 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-14J | 10MW | Balanced Line or Mike to Single Grid | 600 CT/150 | 20,000 | 55 | 1465 | 1:5.77 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .27 |
| A-15J | 10MW | Balanced Line or Mike | 600/250/50 | 20,000 | 53 | 1400 | 1:5.77 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .25 |
| A-52J | 100MW | Line or Transistor to Line or Transistor | 500 CT/125§§§ 20 MA D.C. | 2000 CT/ 500§§§ | 50 | 200 | 1:2 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-56J | 100MW | Line or Transistor to Voice Coil | 500 CT/125§§§ 15 MA D.C. | 16/4§§§ | 50 | 1.5 | 5.6:1 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-79J | 200MW | Transistor to P-P Transistors or Line | 1000 10 MA D.C. | 200 CT/50§§§ | 302 | 138 | 2.2:1 | 20-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-58J | 100MW | P-P Plates or Transistors to Line or Transistors | 10,000 CT/ 2500§§§ | 2000 CT/ 500§§§ | 1000 | 200 | 2.24:1 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-40J | 10MW | Plate to 1 or 2 Grids | 15,000 | 115,000 CT | 1540 | 4020 | 1:2.76 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-41J | 32MW | Tube to 1 or 2 Grids | 15,000 8 MA D.C. | 80,000 CT | 1392 | 8109 | 1:2.3 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-55J | 100MW | Plate to Line | 15,000 | 600/250/75 | 1020 | 46 | 5:1 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-61J | 50MW | Line to 2 simultaneously loaded lines or transistors | 600/150§§§ | 600/150§§§ 600/150§§§ | 47 | 40 40 | 1.4:1:1 | 60-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-65J | 100MW | Single or Push-Pull Plates to Balanced Line | 15,000 CT | 600 CT/150§§§ | 1630 | 73 | 5:1 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-66J | 100MW | Plate to Line | 15,000 4 MA D.C. | 600/250/ 50 | 1740 | 81.2 | 5:1 | 40-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-68J | 100MW | Sgl. or P-P Plates to Balanced Line | 15,000 CT 4 MA D.C. | 600 CT/150§§§ | 1723 | 81 | 5:1 | 40-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-69J | 100MW | P-P Plates or Bridging to Line | 25,000 CT/ 6250§§§ 2.5 MA D.C. | 500 CT/ 125§§§ | 2500 | 50 | 7.1:1 | 50-20,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-78J | 100MW | 1 or 2 Transistor to Balanced Line | 2,000 CT | 600 CT/150§§§ | 112 | 48.5 | 1.82:1 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-57J‡ | 50MW | Line or Transistor to Line | 600/250/ 50 | 600/250/ 50 | 40 | 44 | 1:1 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |
| A-67J‡ | 50MW | Balanced Line to Balanced Line | 600 CT/150§§§ | 600 CT/150§§§ | 43.8 | 44.1 | 1:1 | 30-15,000 | 500 | J | Leads | 1¾ | 1⅜ | ⅜ | .35 |



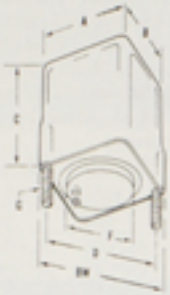




PERFORMANCE CURVES
A-11J
A-12J
A-13J
A-66J
A-68J



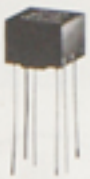



AF Case



| | AF |
|---|---|
| A | 1 1/64 |
| B | 1 1/64 |
| Bw | 1 1/64 |
| C | 1 1/32 |
| D | 21/32 |
| F | 5/8 |
| G | 4-40 |
| Unit Wt. | 2 1/2 oz. |

PL-20, PL-21



PL-30 through PL-34

PL-10, PL-11 Trigger Coil

## JAF SERIES

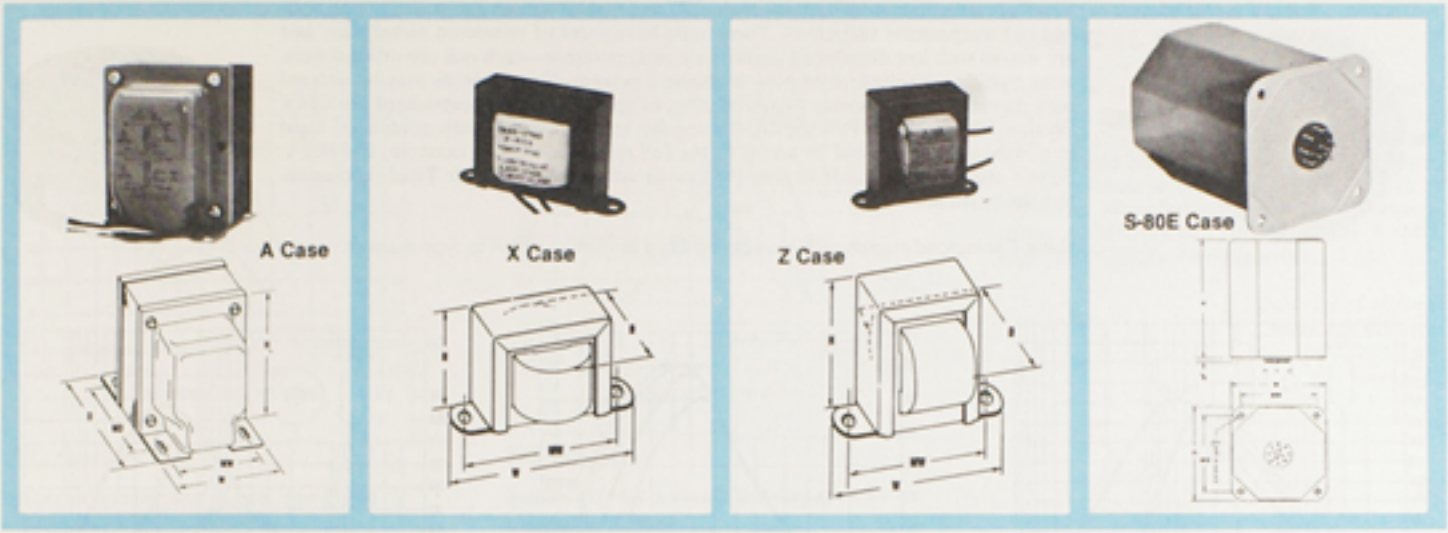
| Type No. | Mil. Type Number | Power Output | Application | Matching Impedance Primary | Matching Impedance Secondary | D.C. Resistance Primary | D.C. Resistance Secondary | Overall Turns Ratio | Frequency Response ± 3 DB | RMS Test Voltage | Magnetic Shielding | F. Dim Inch | Case | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JAF-1‡ | TF1QX10YY | 1MW. | Line or Mike to Grid | 600/250/50 | 50,000 | 100 | 3180 | 1:9.16 | 60-15,000 | 500 | 45 DB | 5/16 | AF | .1 |
| JAF-5‡ | TF1QX10YY | 1MW. | Mike to Voice Coil to Grid | 30/12/4 | 50,000 | 6 | 3500 | 1:39.7 | 50-15,000 | 500 | 45 DB | 5/16 | AF | .1 |
| JAF-12 | TF1QX10YY | 10MW. | Plate to Sgl. or P.P. Grids | 15,000 | 60,000 CT | 1350 | 2700 | 1:2 | 60-15,000 | 500 | 45 DB | 5/16 | AF | .1 |
| JAF-13 | TF1QX15YY | 10MW. | Plate to Sgl. or P.P. Grids | 15,000 3 MA. D.C. | 95,000 CT | 1330 | 3330 | 1:2.5 | 350-7,000 | 500 | 45 DB | 5/16 | AF | .1 |
| JAF-31‡ | TF1QX16YY | 10MW. | Line to Line | 600/250/50 | 600/250/50 | 55 | 80 | 1:1 | 60-15,000 | 500 | 45 DB | 5/16 | AF | .1 |
| JAF-32 | TF1QX13YY | 20MW. | Transistor to Transistor or Line | 1500 CT 2 MA. D.C. | 600 CT/150§ | 150 | 60 | 1.58:1 | 50-20,000 | 500 | 45 DB | 5/16 | AF | .1 |
| JAF-33‡ | TF1QX21YY | 10MW. | Line to Line Hi Imp. Isolation | 5,000 CT | 5000 CT | 1500 | 2200 | 1:1 | 60-15,000 | 500 | 45 DB | 5/16 | AF | .1 |
| JAF-34 | TF1QX17YY | 20MW. | Transistor or Line to Transistor or Line | 500 CT 2 MA. D.C. | 500 CT/125§ | 45 | 50 | 1:1.03 | 50-20,000 | 500 | 45 DB | 5/16 | AF | .1 |
| JAF-101 | TF1QX20YY | | Coupling Reactor | 50 Henries@ .75 MA. D.C. | | 4000 | | | | 500 | 45 DB | 5/16 | AF | .1 |

## TRIGGER-PHOTOFLASH transformers

| Type No. | Application | Turns Ratio | Primary Inductance | Leakage Inductance | D.C. Resistance Primary | D.C. Resistance | Secondary | Output Volts or Volt—μ Sec Rating | Dimensions Dia. | Dimensions Length | Ht. | Weight Oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PL-10 | PHOTOFLASH | 1:30 | 2μH | 1μH | .2 | | 115 | 6-8KV | ½ | ¾ | | ½ |
| PL-11 | PHOTOFLASH | 1:30 | 15μH | 1.5μH | .156 | | 113 | 10-12KV | ½ | ¾ | | ½ |
| PL-20 | SCR TRIGGER | 1:1 | 200μH | 2μH | 1.1 | | 1.1 | 2000 VμSec | ⅜ | ¾ | | 1 |
| PL-21 | SCR TRIGGER | 1:1:1 | 200μH | 2μH | 1.1 | 1.1 | 1.1 | 2000 VμSec | ⅜ | ¾ | | 1 |
| PL-30 | SCR TRIGGER | 1:1:1 | 7.5mHy | 90μH | 1.85 | 1.85 | 1.85 | 130 VμSec | .562 | .562 | .343 | ½ |
| PL-31 | SCR TRIGGER | 1:1 | 7.5mHy | 90μH | 1.9 | 1.9 | | 130 VμSec | .562 | .562 | .343 | ½ |
| PL-32 | SCR TRIGGER | 2:1 | 7.5mHy | 100μH | 1.8 | | .95 | 130 VμSec | .562 | .562 | .343 | ½ |
| PL-33 | SCR TRIGGER | 2:1:1 | 7.5mHy | 100μH | 1.9 | .95 | .95 | 130 VμSc | .562 | .562 | .343 | ½ |
| PL-34 | SCR TRIGGER | 5:1 | 7.5mHy | 115μH | 1.8 | .42 | | 130 VμSec | .562 | .562 | .343 | ½ |

**CT** for Center Tap. §Balanced two windings. ‡Static shield. §§§ Split winding.

■ Williamson type circuit may be used. Taps on primary for proper screen operation. ■■ See case chart, page 29.




These medium-priced audio components are manufactured to Triad's strict quality control standards to provide highly reliable performance in minimum over-all space. Designed for quick and easy mounting, they have exceptional construction features which make them ideal for replacement purposes in public address, amateur radio, and all other audio systems. Like all standard Triad units, these are instantly obtainable from your stocking Triad distributor.

Triad's research, quality control, and production capabilities have combined to turn out complete transformer coverage for today's complex tube and circuitry developments. As industry leader in the replacement field, Triad offers: minimum over-all size . . . greatest life expectancy . . . easy mounting . . . exact location placement in chassis . . . widest range of types and power ratings . . . economical price.

## HIGH FIDELITY OUTPUT / tube to line or voice coil

| Type No. | Output Watts | Application | Matching Impedance Primary | Matching Impedance Secondary | D.C. Resistance Primary | D.C. Resistance Secondary | Primary Ma. D.C. Per Side | Overall Turns Ratio | Frequency Response ± 3 DB | RMS Test Voltage | Case Type | Connections Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-142A | 15 | P.P. 6V6's, EL84's, etc. to Speaker | 8000 CT□ | 16/8/4 | 450 | .76 | 50 | 22.2:1 | 20-20,000 | 1500 | A | 2 | 3 5/16 | 2 11/32 | 3 3/8 | 2 | 2 3/4 | 3.75 |
| S-35A | 20 | P.P. 6L6's, etc. to Speaker | 5000 CT | 16/8/4 | 320 | .8 | 80 | 17.6:1 | 20-20,000 | 1500 | A | 1 | 3 5/16 | 2 11/32 | 3 3/8 | 2 | 2 11/16 | 4.3 |
| S-146A | 25 | P.P. 5881, 6L6's, etc. to Speaker | 6600 CT□ | 16/8/4 | 250 | .715 | 80 | 20:1 | 10-50,000 | Pri. 2000 Sec. 1500 | A | 2 | 3 1/2 | 2 11/32 | 4 1/4 | 2 1/4 | 3 1/8 | 5.75 |
| S-42A | 50 | P.P. Par. 6L6's Class A to Speaker | 4500 CT | 16/8/4 | 147 | .56 | 140 | 16.9:1 | 30-15,000 | 1500 | A | 1 | 4 1/4 | 3 15/32 | 4 3/8 | 2 3/4 | 3 1/2 | 8.25 |
| SR-45Z | 10 | 70 Volt Line Autoformer | 4000/2000/1000/500 | 16/8/4 | 255 | .77 | - | 15.7:1 | 20-20,000 | 1000 | Z | Leads | 2 13/32 | 3 1/8 | 2 1/8 | 2 13/16 | | 1.75 |
| S-46A | 20 | 70 Volt Line Autoformer | 2000/1000 500/250 | 16/8/4 | 88 | .82 | - | 11:1 | 30-15,000 | 1000 | A | 1 | 3 5/16 | 2 11/32 | 3 3/8 | 2 | 2 5/8 | 4 |

## OUTPUT / tube to voice coil & line

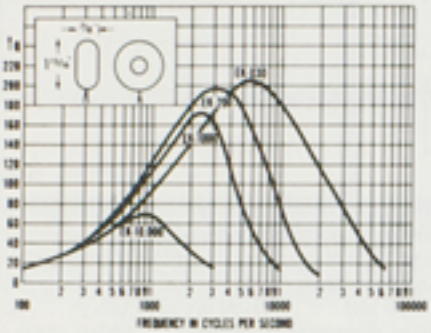
| Type No. | Output Watts | Application | Matching Impedance Primary | Matching Impedance Secondary | D.C. Resistance Primary | D.C. Resistance Secondary | Primary Ma. D.C. Per Side | Overall Turns Ratio | Frequency Response ± 3 DB | RMS Test Voltage | Case Type | Connections or Lead Holes Used | Case Dimension H | Case Dimension W | Case Dimension D | Mounting Dimension MW | Mounting Dimension MD | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-28X | 5 | Single Plate to Line or Speaker | 7500 | 500/16/8/4 | 595 | 35.8 | 40 | 4.05:1 | 50-12,000 | 1000 | X | Leads & Lugs | 1 1/16 | 3 5/16 | 1 3/4 | 2 13/16 | | 1 |
| S-29X | 5 | Single Plate to Line or Speaker | 5000 | 500/16/8/4 | 660 | 56 | 45 | 3.16:1 | 50-12,000 | 1000 | X | Leads & Lugs | 1 1/16 | 3 5/16 | 1 3/4 | 2 13/16 | | 1 |
| S-22A | 15 | P.P. Plates to Line or Speaker | 5000 CT | 500/16/8/4 | 424 | 48.3 | 50 | 3.16:1 | 25-15,000 | 1500 | A | 1 | 2 13/32 | 2 11/32 | 2 5/8 | 1 3/4 | 1 1/8 | 2.5 |
| S-24A | 15 | P.P. Plates to Line or Speaker | 8000 CT | 500/16/8/4 | 675 | 39.5 | 40 | 3.98:1 | 20-15,000 | 1500 | A | 1 | 2 13/32 | 2 11/32 | 2 13/16 | 1 3/4 | 1 1/8 | 2.5 |
| S-80E | 20 | P.P. Plates to Line or Speaker | 8000 CT | 500/200/70/16/8/5/3/1.5 | 199 | 21.33 .504 | 200 | 22.2:1:5.5 | 40-10,000 | 1500 | Spl. | — | 3 3/4 | 3 | 3 | 2 5/8 | 2 5/8 | 3.5 |
| S-60A | 35 | P.P. Plates to Line or Speaker | 6600 CT | 500/250/16/8/4 | 118.5 | 9.6 | 150 | 3.65:1 | 30-20,000 | 2000 | A | 2 | 3 1/8 | 3 5/32 | 3 3/8 | 2 1/2 | 2 1/4 | 4 |

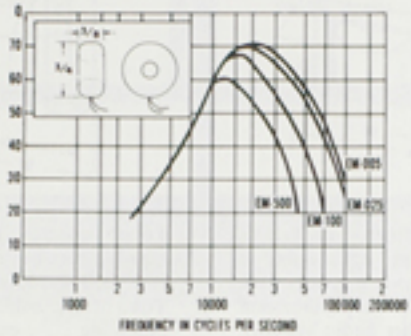
# Toroidal Inductors

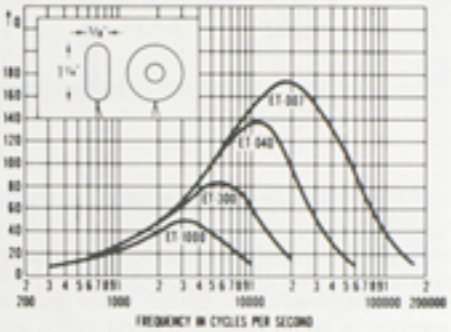
TRIAD-UTRAD
A Division of Magnetics, Inc.

Triad Toroidal Inductors have the highest Q and highest measure of stability with voltage and temperature variations. These units have cores of powdered nickel alloy and are wound with low distributed capacitance and resistance—each coil providing a minimum inductance tolerance of plus or minus 2 percent. Triad toroids may be ordered with standard leads in strong plastic coating, or epoxy molded, encapsulated per Specification MIL-T-27B; TF5RX20ZZ. To specify molded toroids with goldplated fixed terminals, an "A" should be added to the full type number; for example, EM-001A. Should special applications require even closer tolerances, call your Triad representative for assistance.


**Note:** For molded toroids with gold plated fixed terminals, add A to type number.




## EK Series

**For maximum "Q" and power.**

| Type No. | Ind. | Res. ohms approx. | DC-ma. for 5% Ind. drop |
|---|---|---|---|
| EK-030 | 30 mh | 1.4 | 150 |
| EK-030A | 30 mh | 1.4 | 150 |
| EK-040A | 40 mh | 1.9 | 130 |
| EK-080A | 80 mh | 3.1 | 92 |
| EK-100 | 100 mh | 4.4 | 82 |
| EK-200 | 200 mh | 7.5 | 58 |
| EK-200A | 200 mh | 7.5 | 58 |
| EK-250 | 250 mh | 9.0 | 52 |
| EK-250A | 250 mh | 9.0 | 52 |
| EK-700 | 700 mh | 27.0 | 31 |
| EK-1000 | 1000 mh | 45.0 | 26 |
| EK-1000A | 1000 mh | 45.0 | 26 |
| EK-3000 | 3000 mh | 116 | 15 |
| EK-20000 | 20000 mh | 800 | 5.8 |

## EM Series

**For extremely miniaturized circuits such as missile applications, where size and weight must be kept to a minimum.**

| Type No. | Ind. | Res. ohms approx. | DC-ma. for 5% Ind. drop |
|---|---|---|---|
| EM-001 | 1 mh | 1.25 | 150 |
| EM-001A | 1 mh | 1.25 | 150 |
| EM-002 | 2 mh | 1.70 | 108 |
| EM-004 | 4 mh | 2.60 | 76 |
| EM-005 | 5 mh | 3.10 | 68 |
| EM-007A | 7 mh | 4.5 | 57 |
| EM-010 | 10 mh | 6.5 | 48 |
| EM-010A | 10 mh | 6.5 | 48 |
| EM-025 | 25 mh | 16.5 | 30 |
| EM-030A | 30 mh | 18 | 27.6 |
| EM-050 | 50 mh | 30 | 22 |
| EM-100A | 100 mh | 66 | 15 |
| EM-250A | 250 mh | 155 | 9.6 |
| EM-1000 | 1000 mh | 650 | 4.8 |
| EM-1000A | 1000 mh | 650 | 4.8 |

## ET Series

**Optimum combination of size, power and "Q."**

| Type No. | Ind. | Res. ohms approx. | DC-ma. for 5% Ind. drop |
|---|---|---|---|
| ET-001 | 1 mh | .30 | 680 |
| ET-001A | 1 mh | .30 | 680 |
| ET-002 | 2 mh | .50 | 480 |
| ET-002A | 2 mh | .50 | 480 |
| ET-003 | 3 mh | .68 | 396 |
| ET-005A | 5 mh | 1.10 | 306 |
| ET-007 | 7 mh | 1.50 | 260 |
| ET-010A | 10 mh | 2.0 | 217 |
| ET-015 | 15 mh | 2.85 | 177 |
| ET-015A | 15 mh | 2.85 | 177 |
| ET-020A | 20 mh | 4.0 | 153 |
| ET-030A | 30 mh | 6.5 | 125 |
| ET-040 | 40 mh | 9.2 | 108 |
| ET-040A | 40 mh | 9.2 | 108 |
| ET-050 | 50 mh | 10.3 | 97 |
| ET-100 | 100 mh | 24 | 68 |
| ET-100A | 100 mh | 24 | 68 |
| ET-150 | 150 mh | 35 | 56 |
| ET-200 | 200 mh | 44.5 | 48 |
| ET-250 | 250 mh | 64 | 43 |
| ET-250A | 250 mh | 64 | 43 |
| ET-300 | 300 mh | 70 | 40 |

### OPEN TYPE SIZES AND WEIGHTS

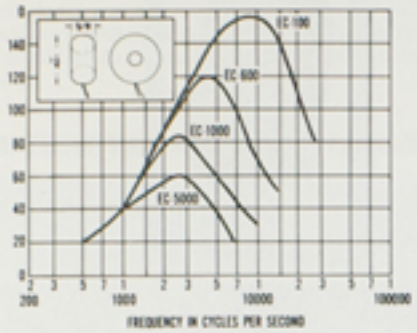
| | EA Series | EC-ET Series | EK Series | EM Series |
|---|---|---|---|---|
| DIA. | 1⅛ | 1¾ | 2⅛ | 11/16 |
| HT. | ½ | ⅝ | 15/16 | ⅜ |
| I.D. | ¼ | ¼ | 5/16 | ⅛ |
| WT. (oz.) | .6 | 1.6 | 5 | .2 |

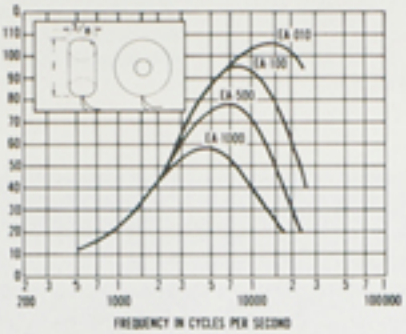

A Case


EM Series, only

### MOLDED TYPE SIZES AND WEIGHTS

| | EA Series | EC-ET Series | EK Series | EM Series |
|---|---|---|---|---|
| DIA. | 1⅛ | 1⅜ | 2 | ¾ |
| HT. | ½ | 11/32 | 1 | ⅜ |
| I.D. | 5/64 | 5/64 | 5/64 | 1/64 |
| WT. (oz.) | .8 | 2 | 6 | .3 |




## TRIAD SUB-MINIATURE TOROIDAL INDUCTORS

Triad sub-miniature inductors are toroidally wound on permalloy powdered cores. Encapsulated in high temperature epoxy resin. Weldable or solderable leads of gold plated nickel allow. Highly resistant to severe acceleration, shock or vibration. Manufactured to meet the requirements of MIL-T-27B, Grade 5 Class S (MIL type TF5SX20ZZ). Average weight, .1 oz.

Case size of all units is ¾ inch diameter by ¾ inch high.

### EC Series

**Optimum combination of size, power and "Q."**

| Type No. | Ind. | Res. ohms approx. | DC-ma. for 5% Ind. drop |
|---|---|---|---|
| EC-001 | 1 mh | .40 | 520 |
| EC-001A | 1 mh | .40 | 520 |
| EC-003 | 3 mh | .70 | 300 |
| EC-004 | 4 mh | .82 | 260 |
| EC-005 | 5 mh | .92 | 233 |
| EC-005A | 5 mh | .92 | 233 |
| EC-010 | 10 mh | 1.30 | 165 |
| EC-010A | 10 mh | 1.30 | 165 |
| EC-020A | 20 mh | 1.85 | 116 |
| EC-030 | 30 mh | 2.85 | 95 |
| EC-030A | 30 mh | 2.85 | 95 |
| EC-050 | 50 mh | 5.50 | 74 |
| EC-050A | 50 mh | 5.50 | 74 |
| EC-070 | 70 mh | 8.30 | 62 |
| EC-070A | 70 mh | 8.30 | 62 |
| EC-100 | 100 mh | 13.00 | 52 |
| EC-100A | 100 mh | 13.00 | 52 |
| EC-260 | 200 mh | 23.00 | 37 |
| EC-200A | 200 mh | 23.00 | 37 |
| EC-250 | 250 mh | 33.00 | 33 |
| EC-250A | 250 mh | 33.00 | 33 |
| EC-300 | 300 mh | 35.00 | 30 |
| EC-300A | 300 mh | 35.00 | 30 |
| EC-400 | 400 mh | 42.00 | 26 |
| EC-400A | 400 mh | 42.00 | 26 |
| EC-500 | 500 mh | 72.00 | 23 |
| EC-1000 | 1000 mh | 134 | 16.5 |
| EC-1000A | 1000 mh | 134 | 16.5 |
| EC-2000A | 2000 mh | 220 | 11.6 |
| EC-3000 | 3000 mh | 370 | 9.5 |
| EC-3000A | 3000 mh | 370 | 9.5 |
| EC-5000 | 5000 mh | 780 | 7.4 |
| EC-10000A | 10000 mh | 1100 | 5.2 |

### EA Series

**Smaller size for compact circuitry such as airborne applications.**

| Type No. | Ind. | Res. ohms approx. | DC-ma. for 5% Ind. drop |
|---|---|---|---|
| EA-001 | 1 mh | .40 | 270 |
| EA-001A | 1 mh | .40 | 270 |
| EA-002 | 2 mh | .58 | 192 |
| EA-002A | 2 mh | .58 | 192 |
| EA-010 | 10 mh | 2.10 | 86 |
| EA-010A | 10 mh | 2.10 | 86 |
| EA-015 | 15 mh | 3.10 | 70 |
| EA-020A | 20 mh | 4.25 | 60 |
| EA-025 | 25 mh | 4.80 | 54 |
| EA-025A | 25 mh | 4.80 | 54 |
| EA-030 | 30 mh | 6.70 | 50 |
| EA-040 | 40 mh | 9.50 | 43 |
| EA-040A | 40 mh | 9.50 | 43 |
| EA-050A | 50 mh | 11.0 | 38 |
| EA-100 | 100 mh | 23.0 | 27 |
| EA-150 | 150 mh | 37.0 | 22 |
| EA-200 | 200 mh | 42.0 | 19 |
| EA-250 | 250 mh | 60.0 | 17 |
| EA-250A | 250 mh | 60.0 | 17 |
| EA-300 | 300 mh | 70.0 | 16 |
| EA-500 | 500 mh | 115 | 12 |
| EA-500A | 500 mh | 115 | 12 |
| EA-600 | 600 mh | 150 | 11 |
| EA-1000 | 1000 mh | 260 | 8.6 |
| EA-1000A | 1000 mh | 260 | 8.6 |

| Type No. | Ind. | Res. ohms approx. | DC-ma. for 5% Ind. drop |
|---|---|---|---|
| EX-005A | 5 mh | 11 | 47 |
| EX-015A | 15.0 mh | 23.0 | 27 |
| EX-040A | 40.0 mh | 54.0 | 15 |
| EX-060A | 60.0 mh | 82.0 | 15 |
| EX-200A | 200 mh | 139 | 6 |
| EX-300A | 300 mh | 206 | 5 |

* Will give less than 5% inductance drop but should not be exceeded under operating conditions.

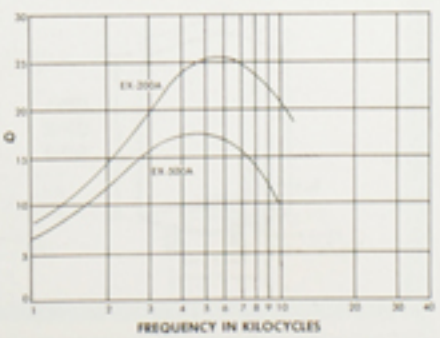
Inductance tolerance of EX-002A through EX-300A is ±2%.

### "Q" vs. frequency curves on Sub-miniature Inductors

$$Q=\frac{\omega L}{R_{eff}}$$

$\omega=2\pi f$ where f is freq. in cps
L=inductance in henries
$R_{eff}$=effective resistance

These curves show "Q" versus frequency for eight typical Triad type EX toroidal inductors. At low frequencies the effective resistance consists principally of the DC resistance of the coil; therefore, "Q" increases linearly with frequency. As the frequency is raised, core losses (hysteresis, eddy current and residual) increase the effective resistance. Distributed capacity in the winding effectively increases the reactive inpedance until resonance, then reduces it. As a result, the "Q" curve levels off and then drops.




GP Case

## LOW LEVEL AUDIO INPUT

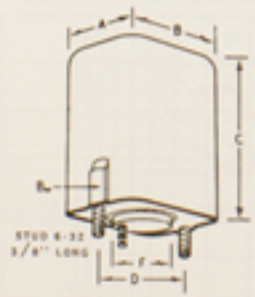
| Type No. | Mil. Type Number | Power Output | Application | Matching Impedance Primary | Matching Impedance Secondary | DC Resistance Primary | DC Resistance Secondary | Overall Turns Ratio | Frequency Response ±3 DB | RMS Test Voltage | Magnetic Shielding | F. Dim. Inch | Case | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS-1‡ | TF1QX10YY | 10MW. | Universal-Line or Mike to Grid | 600§/250§/150/62.5 | 77,000 | 70 | 3640 | 1:11.3 | 20-20,000 | 500 | 90 DB P-5 | ⅞ | GP-4 | .75 |
| HS-4‡ | TF1QX10YY | 10MW. | Universal-Line or Mike to Sgl. or P.P. Grids | 600§/250§/150/62.5 | 117,600 CT | 70 | 4160 | 1:14 | 20-20,000 | 500 | 70 DB P-3 | ⅞ | GP-4 | .65 |
| HS-5 | TF1QX10YY | 1MW. | Dynamic Mike to Grid | 30 | 127,500 | 4.1 | 4860 | 1:65.2 | 40-12,000 | 500 | 90 DB P-5 | ⅞ | GP-4 | .7 |

## LOW LEVEL AUDIO INTERSTAGE

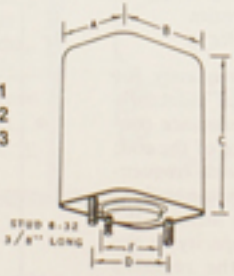
| Type No. | Mil. Type Number | Power Output | Application | Matching Impedance Primary | Matching Impedance Secondary | DC Resistance Primary | DC Resistance Secondary | Overall Turns Ratio | Frequency Response ±3 DB | RMS Test Voltage | Magnetic Shielding | F. Dim Inch | Case | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS-27 | TF1QX15YY | 130MW. | Sgl. or P.P. Plates to Sgl. or P.P. Grid | 20,000 CT§/5000 | 60,000 CT§/15,000 | 1700 | 6420 | 1:1.72 | 20-20,000 | 1000 | 45 DB P-1 | ⅞ | GP-4 | .72 |
| HS-29 | TF1QX10YY | 20MW. | Sgl. or P.P. Plates to Sgl. or P.P. Grids | 20,000 CT§/5000 | 80,000 CT§/20,000 | 2000 | 4,000 | 1:2 | 20-20,000 | 500 | 90 DB P-5 | ⅞ | GP-4 | .7 |
| HSM-31 | TF4RX19FA | 3W. | Sgl. or P.P. Plates to Sgl. or P.P. Grids | 20,000 CT§/5000 | 20,000 CT§/5000 CT | 2060 | 950 | 1:1 | 20-20,000 | 1500 | - | 1⅛ | FA■■ | 2 |
| HS-32 | TF1QX15YY | 200MW. | Sgl. Plate to Sgl. or P.P. Grids | 15,000 (6MA. D.C.) | 60,000 CT§/15,000 | 5000 | 10,000 | 1:2 | 20-15,000 | 1000 | 45 DB P-1 | ⅞ | GP-5 | 1.13 |

## LOW LEVEL AUDIO OUTPUT / mixing, matching & bridging

| Type No. | Mil. Type Number | Power Output | Application | Matching Impedance Primary | Matching Impedance Secondary | D.C. Resistance Primary | D.C. Resistance Secondary | Overall Turns Ratio | Frequency Response ±3 DB | RMS Test Voltage | Magnetic Shielding | F. Dim. Inch | Case | Max. Unit Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS-50 | TF1QX16YY | 400MW. | Sgl. Plate to Line | 15,000 | 600§/250§/150/62.5 | 1020 | 52.6 | 5:1 | 20-20,000 | 500 | 70 DB P-3 | ⅞ | GP-4 | .75 |
| HS-60 | TF1QX16YY | 20MW. | Sgl. Plate to Line | 15,000 | 600§/250§/150/62.5 | 900 | 45 | 5:1 | 20-20,000 | 500 | 45 DB P-1 | 1 3/32" | GP-2 | .4 |
| HS-52 | TF1QX13YY | 400MW. | P.P. Plates to Line | 20,000 CT§/5000 | 600§/250§/150/62.5 | 815 | 30 | 5.6:1 | 20-20,000 | 1000 | 45 DB P-1 | ⅞ | GP-4 | .85 |
| HS-56V‡ | TF1SX16YY | 100MW. | Line to Line | 600§/250§/150/62.5 | 600§/250§/150/62.5 | 60 | 60 | 1:1 | 10-30,000 | 500 | 70 DB P-3 | ⅞ | GP-4 | .75 |
| HS-66‡ | TF1QX16YY | 100MW. | Line to Line | 600§/250§/150/62.5 | 600§/250§/150/62.5 | 60 | 60 | 1:1 | 10-30,000 | 500 | 45 DB P-1 | ⅞ | GP-3 | .6 |



GP-1
GP-2
GP-3



GP-4
GP-5

| | GP-2 | GP-3 | GP-4 | GP-5 |
|---|---|---|---|---|
| A | 1 1/16 | 1¼ | 1 5/16 | 1⅜ |
| B | 1¼ | 1 5/16 | 1⅜ | 2 |
| Bw | 1 11/32 | 1 11/32 | — | — |
| C | 2¼ | 2⅜ | 2½ | 2⅝ |
| D | 1 5/16 | 1 11/32 | 1½ | 1½ |
| F | ¾ | 15/16 | 15/16 | 15/16 |

### SHIELDING

**P-1**—One nickel alloy high permeability shield—45db. reduction in pickup.

**P-3**—Two nickel alloy shields interleaved with one heavy copper shading ring—70db. reduction in pickup.

**P-5**—Three nickel alloy shields interleaved with two heavy copper shading rings—90db. reduction in pickup.

■ ■ See Chart Page 33

All cases used for housing Triad low-frequency components are drawn from Mumetal and dry hydrogen-annealed after fabrication to provide the greatest possible low-density permeability. When Mumetal cases are used with heavy copper interleaving, maximum attenuation as high as 100 db. is achieved; additional reduction in pickup through use of humbucking coils can add 45 db. in the most effective plane. Stray field shield designations are:

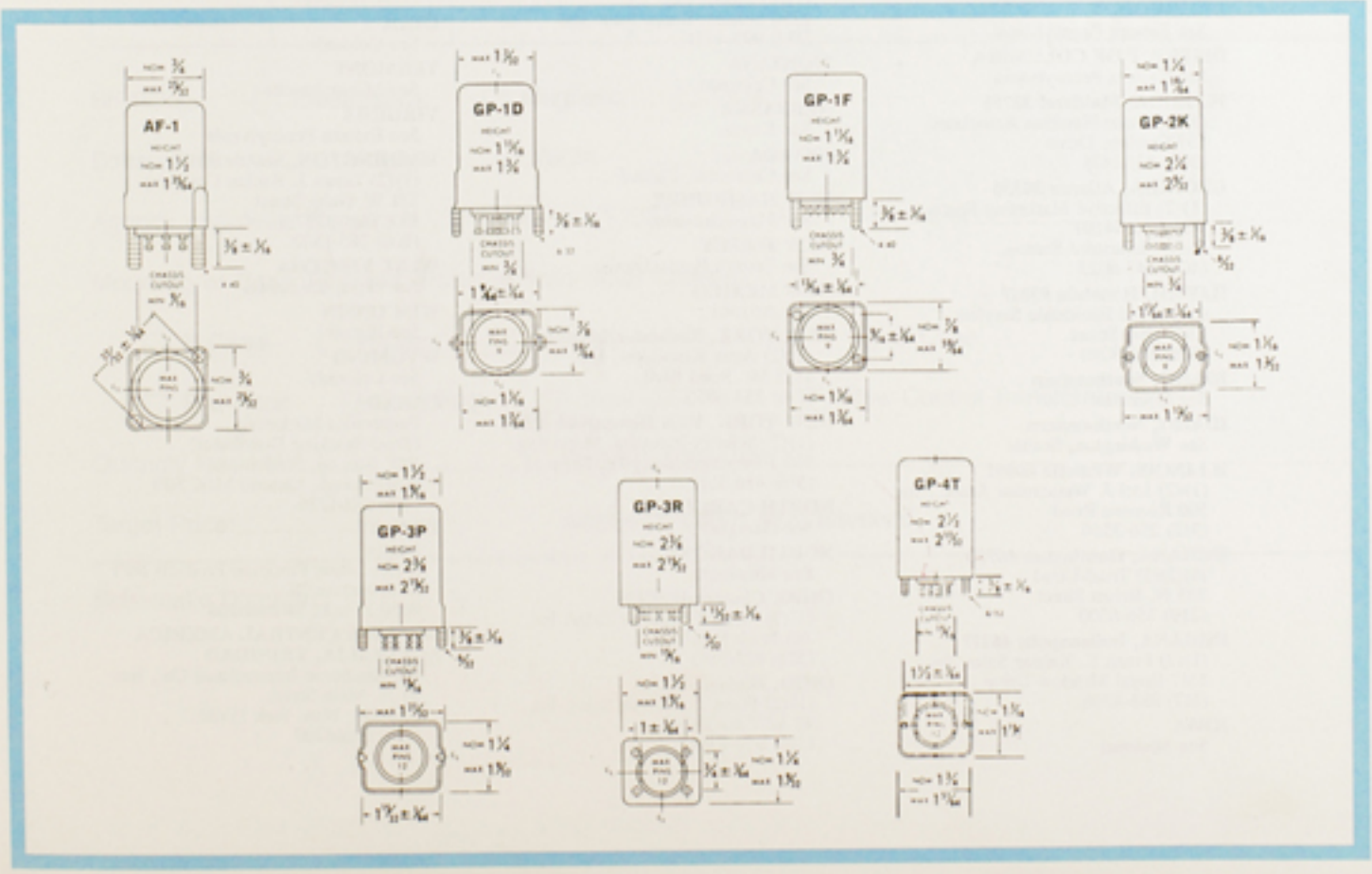
P—1 one Mumetal case gives 45 db;
P—1H P—1 shielding with humbucking coils gives 90 db;
P—3 two Mumetal cases with copper interleaving gives 70 db;
P—3H P—3 shielding with humbucking coils gives 115 db;
P—5 three Mumetal shields with interleaving gives 95 db;
P—5H P—5 shielding with humbucking coils provides 135 db in most effective plane.

## INTERSTAGE TRANSFORMERS

| Type No. | Primary Inductance @ 10MV-60CPS | Primary Matching Impedance In Ohms | Secondary Matching Impedance In OHMS | DC Resistance Primary In Ohms | DC Resistance Secondary In Ohms | Turns Ratio | Frequency Response In C.P.S. ± 1DB | Max. Level DBM | Stray Fields Shield | Case | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|
| G-31‡ | 350 h. | 10,000§ or 2500§§ | 100,000§ or 25,000§§ | 1400 | 10,000 | 1-3.16 | 5-5000 | -15 | P1-H | GP-2K | 5¼ oz. |
| G-40‡ | 230 h. | 10,000§ or 2500§§ | 483,000§ or 120,700§§ | 1100 | 17,000 | 1-7 | 7.5-1500 | -10 | P1-H | GP-3P | 7¾ oz. |
| G-48 | 18 h. | 1000§ or 250§§ | 250§ or 62½§§ | 165 | 40 | 2-1 | 10-30,000 | -10 | P1 | GP-1D | 2¾ oz. |
| G-336 | 160 h. | 10,000§ or 2500§§ | 22,500** | 2600 | 4200 | 1-1.5 | 12-20,000 | -10 | P1-H | AF-1 | 1.5 oz. |
| G-435 | 285 h. | 10,000§ or 2500§§ | 90,000** | 2700 | 9500 | 1-3 | 6.5-5000 | -15 | P1-H | GP-1F | 3.2 oz. |

## INPUT TRANSFORMERS

| Type No. | Primary Inductance @ 10MV-60 CPS | Primary Matching Impedance In Ohms | Secondary Matching Impedance In Ohms | DC Resistance Primary In Ohms | DC Resistance Secondary In Ohms | Turns Ratio | Frequency Response in C.P.S. ± 1DB | Max. Level DBM | Stray Fields Shield | Case and Mounting | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|
| G-4‡ | .9h. | 60§-44-30§-25 15§§-7½§§-5§-1.25§§ | 157,000§ or 39,250§§ | 9 | 10,400 | 1-51 | 11-5000 | 0 | P5-H | GP-4T | 11½ oz. |
| G-5‡ | 55 h. | 1000§-666-466-400§ 250§§-135§-100§§-34§§ | 137,000§ or 34,250§§ | 235 | 15,500 | 1-11.75 | 3-4000 | -10 | P1-H | GP-3P | 7¾ oz. |
| G-17‡ | 4 h. | 200§-50§§ | 442,000** | 17 | 26,000 | 1-47 | 8.5-2500 | -10 | P3-H | GP-3R | 8 oz. |
| G-101‡ | 8.3 h. | 500§-333-233-200§ 125§§-67½§-50§§-17§§ | 145,000** | 120 | 10,000 | 1-17 | 11-3700 | -10 | P1-H | GP-1D | 3.2 oz. |



# Sales Representatives

TRIAD-UTRAD
A Division of Magnetek Inc.

## Triad-Utrad
## 305 N. Briant Street
## Huntington, IN 46750

(1) Standard Products Representative (2) Custom Products Representative (3) Warehouse

**ALABAMA**
See Georgia

**ALASKA, Anchorage 99503**
(1) Harry J. Lang & Assoc.
1371 Hillcrest Drive #303
(907) 279-5741

**ARIZONA, Scottsdale 85252**
(1)(2) Bill Earl Associates Inc.
7505 E. Main St., P.O. Box 8668
(602) 994-3813

**ARKANSAS, Alexandria 72002**
(1)(2) JY Schoonmaker Co., Inc.
Rt. 1, Box 44A
(501) 375-2168

**CALIFORNIA, Los Altos 94022**
(1)(2) Recht Associates
2251 Grant Road
(415) 964-6321

**CALIFORNIA, San Diego 92128**
(2) Intramerica Technology Corporation
16776 Bernardo Center Drive, Suite 110B
(619) 451-3383

**CALIFORNIA, Upland 91786**
(1)(2)(3) Tracy Electronic Sales
1820 West 11th St., Unit B
(714) 985-0423

**COLORADO, Denver 80222**
(1)(2) Lindberg Company
6140 E. Evans Ave.
(303) 758-9033

**CONNECTICUT**
See Massachusetts

**DELAWARE**
See Eastern Pennsylvania

**DISTRICT OF COLUMBIA**
See Eastern Pennsylvania

**FLORIDA, Maitland 32751**
(1)(2) Hutto-Hawkins Associates
139 Candace Drive
(305) 831-2474

**GEORGIA, Atlanta 30336**
(1)(2) Effective Marketing Force
P.O. Box 44180
Fulton Industrial Station
(404) 948-6023

**HAWAII, Honolulu 95817**
(1) Hawaii Electronic Services
1305 Hart Street
(808) 845-8207

**IDAHO, Southeastern**
See Colorado

**IDAHO, Northwestern**
See Washington, Seattle

**ILLINOIS, Wilmette 60091**
(1)(2) Joel J. Wasserman Assoc., Inc.
500 Romona Road
(312) 256-3566

**INDIANA, Huntington 46750**
(1)(2)(3) Triad-Utrad
305 N. Briant Street
(219) 356-6500

**INDIANA, Indianapolis 46217**
(1)(2) Frank E. Kahsar Sales, Inc.
8617 Royal Meadow Drive
(317) 888-8396

**IOWA**
See Missouri

**KANSAS, Overland Park 66212**
(1)(2) Electri-Rep
7050 W. 107th St., Suite 210
(913) 649-2168

**KENTUCKY**
See Ohio, Cincinnati

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See Arkansas

**MAINE**
See Massachusetts

**MARYLAND**
See Eastern Pennsylvania

**MASSACHUSETTS, Westboro 01581**
(1)(2) Bay Colony Representatives, Inc.
105 Flanders Road
(617) 870-1930

**MICHIGAN, Southfield 48086-5037**
(1)(2) Rathsburg Associates, Inc.
17600 Northland Park Ct., Suite 100
(313) 559-9700

**MINNESOTA, Minneapolis 55436**
(1) Electric Component Sales
4974 Lincoln Drive
(612) 933-2594

(2) Bicon Sales
12353 Drake
P.O. Box 33262
(612) 936-2322

**MISSISSIPPI**
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**MISSOURI, St. Louis 63146**
(1)(2) Electri-Rep
2258 Schuetz Road, Suite 108
(314) 993-4421

**MONTANA**
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**NEBRASKA**
See Kansas

**NEVADA**
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**NEW JERSEY**
See Eastern Pennsylvania

**NEW MEXICO**
See Arizona

**NEW YORK, Rochester 14606**
(1)(2) Apex Associates, Inc.
1133 Mt. Read Blvd.
(716) 254-6050

**NEW YORK, West Hempstead 11552**
(1)(2) Schmitt Industrial Marketing
600 Hempstead Turnpike, Suite 17
(516) 486-3510

**NORTH CAROLINA**
See Georgia

**NORTH DAKOTA**
See Minnesota

**OHIO, Cincinnati 45238**
(1)(2) Frank E. Kahsar Sales, Inc.
781 Neeb Road
(513) 922-3133

**OHIO, Hudson 44236**
(1)(2) Frank E. Kahsar Sales, Inc.
47 W. Case Drive
(216) 650-1089

**OKLAHOMA**
See Texas, Dallas

**OREGON, Portland 97221**
(1)(2) James J. Backer Company
2035 S.W. 58th Street
(503) 297-8744

**PENNSYLVANIA, Eastern Half**
(1)(2) Bresson Associates, Inc.
107 Forrest Ave.
Narberth, Pennsylvania 19072
(215) 664-6460

**PENNSYLVANIA, Western Half**
See Ohio, Hudson

**RHODE ISLAND**
See Massachusetts

**SOUTH CAROLINA**
See Georgia

**SOUTH DAKOTA**
See Minnesota

**TENNESSEE, Memphis**
See Arkansas

**TENNESSEE**
See Georgia

**TEXAS, Dallas 75238**
(1)(2)(3) JY Schoonmaker Company, Inc.
P.O. Box 38150
10710 Sand Hill Road
(214) 349-1650

**TEXAS, Houston 77088**
(1)(2) JY Schoonmaker Company, Inc.
P.O. Box 38443
(713) 738-2427

**UTAH**
See Colorado

**VERMONT**
See Massachusetts

**VIRGINIA**
See Eastern Pennsylvania

**WASHINGTON, Seattle 98109**
(1)(2) James J. Backer Company
221 W. Galer Street
P.O. Box 9327
(206) 285-1300

**WEST VIRGINIA**
See Ohio, Cincinnati

**WISCONSIN**
See Illinois

**WYOMING**
See Colorado

**CANADA**
Paratronics Marketing
(Triad Stocking Distributor)
P.O. Box 86, Station A
Scarborough, Ontario M1K 5B9
(416) 281-1276

**EXPORT**
Europe
(1)(2) Litton Precision Products Int'l
Gubelstrasse 28
8050 Zurich, Switzerland

**SOUTH & CENTRAL AMERICA**
**AUSTRALIA, TRINIDAD**
(1) Minthorne International Co., Inc.
55 N. Main Street
Freeport, New York 11520
(516) 546-4700

# SPECIFICATION SHEET
# FOR YOUR CUSTOM DESIGNED OR MODIFIED STANDARD TRANSFORMERS

Date _____

_____
COMPANY NAME

_____
ENGINEERING CONTACT

_____
ADDRESS

_____
CITY STATE ZIP

**TRANSFORMER/CHOKE DESIGN INFORMATION:**

Unit Types:
- ☐ Power
- ☐ Filament
- ☐ Autoformer
- ☐ Plate
- ☐ Isolation
- ☐ Choke (filter)
- ☐ Other _____

Application: _____

**ELECTRICAL SPECIFICATIONS:**

Primary Input Voltage: _____ Frequency: _____

| Windings | Volts | Amps | Watts | RMS Test Voltage | Termination | Center Taps |
|---|---|---|---|---|---|---|
| #1 Sec. | | | | | | |
| #2 Sec. | | | | | | |
| #3 Sec. | | | | | | |

Shielding: ☐ Electrostatic ☐ Magnetic ☐ Other

Dimensions: ____ Height ____ Width ____ Length

Agency Approvals Required: ☐ UL ☐ CSA ☐ VDE ☐ Other _____

Mounting or Case Type (as shown in Triad-Utrad Catalog)

☐ X Case ☐ P Case ☐ XP Case ☐ Z Case ☐ U Case

☐ Flat Pack ☐ Split Pack ☐ New Quik Pack ☐ New Control Transformer

Quantity Needed: _____ Delivery Required: _____

Target Price: _____ Additional Information Attached

Schematic Diagram:

Cut Here

Fold

**Return Address**

Your Name _____

Company Name _____

Street _____

City _____

State _____ Zip _____

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 193 HUNTINGTON, IN

POSTAGE WILL BE PAID BY ADDRESSEE

TRIAD-UTRAD
A Division of Magnetek Inc.

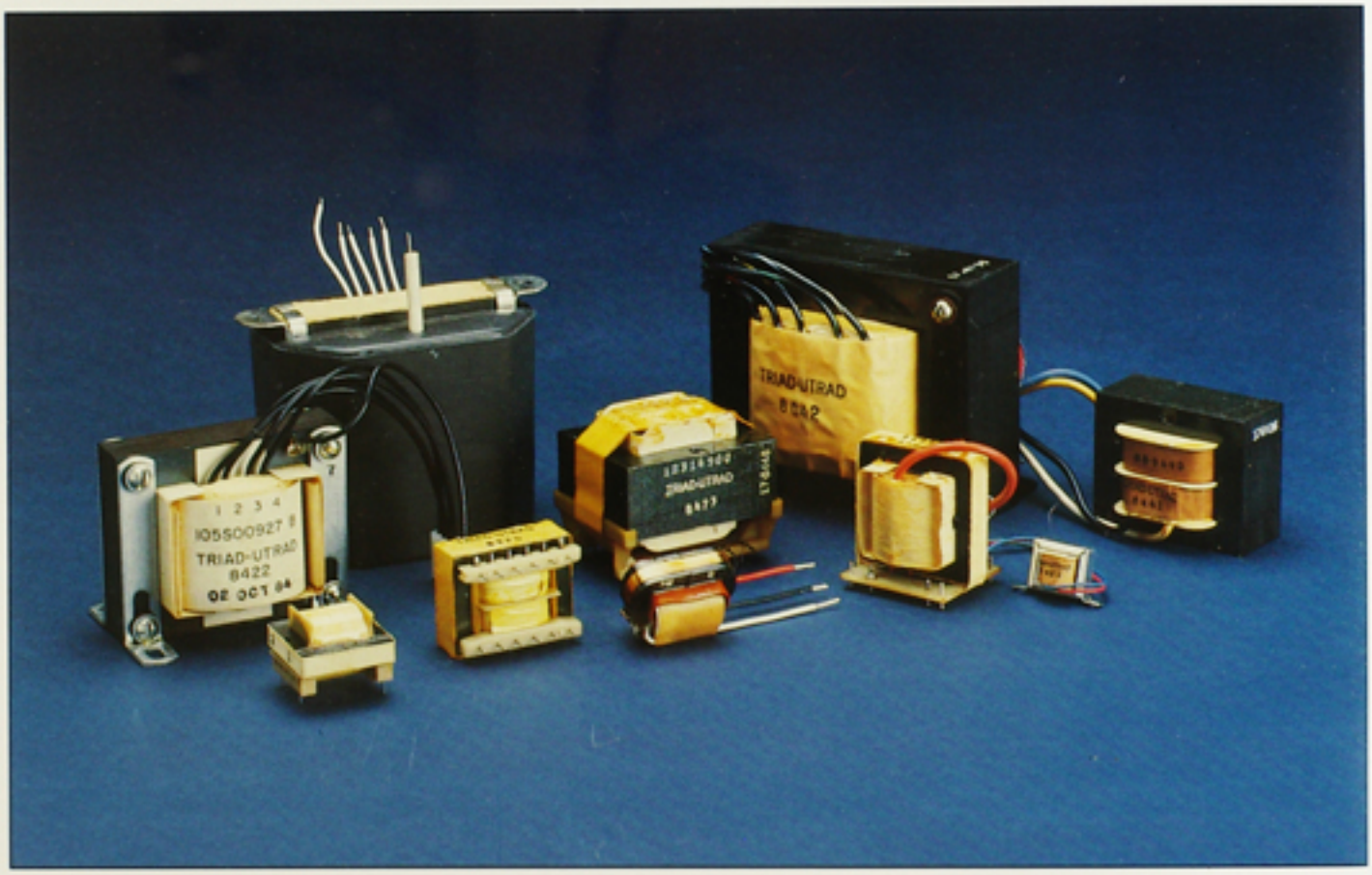
**1124 E. Franklin Street**
**P.O. Box 1147**
**Huntington, IN 46750**

Fold

## *Triad-Utrad Designed Magnetic Components*

### *Today's Innovations for Tomorrow's Products*

For more than 25 years, original equipment manufacturers and design engineers have relied upon Triad-Utrad for innovative solutions to their special design problems.

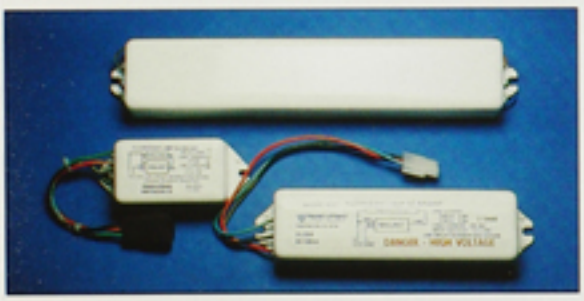


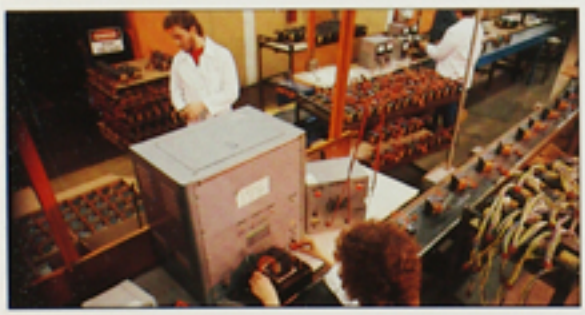

### *Custom Transformers*

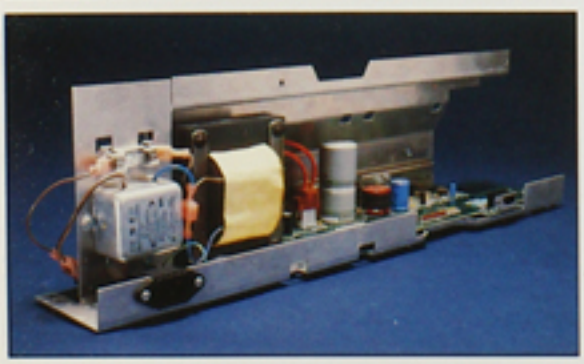
Triad-Utrad designs and manufactures thousands of different custom transformers, from small switcher to large ferro-resonant models.

These components are built to your specifications and application needs. Triad's production capabilities extend from power transformers of 1 watt to 2000 watts, from 45 to more than 20,000 Hz, and from printed circuit board-mounted, open frame or hermetically sealed units. Triad's winding department is capable of single, multiple and bobbin winding. Depending on the components required, we can offer a firm quotation in a few days and deliver prototype quantities in a few weeks.

Triad has been selected by many of the industry's largest manufacturers as the prime source for standard and custom power transformers. Our prices are competitive, our quality is unsurpassed and our service is the best in the industry.







## *Converter/Chargers*

Triad-Utrad converter/chargers for land and marine applications perform the dual function of converting 120 VAC to 12 VDC while restoring batteries to full charge status at the same time. The heart of all Triad converter/chargers is a constant voltage, current limiting ferro-resonant transformer which is designed for protection against overload and a shorted output. Output voltage will not deviate more than .2 volt even when input voltage varies between 90 and 130 volts.

## *AC Fluorescent Electronic Ballasts*

Triad-Utrad has long been a leader in fluorescent lighting ballast technology. Our **Ballastar**® high frequency electronic ballasts offer the advantages of greatly increased energy savings, fast payback and greatly reduced maintenance. **Ballastar** models are available to replace most standard transformer ballasts.

## *DC Fluorescent Electronic Ballasts*

Triad-Utrad DC-input high frequency electronic ballasts are in use around the world, operating fluorescent lights in buses, railcars, boats, aircraft and recreational vehicles. To ensure trouble-free operation, every Triad ballast undergoes stringent reliability testing. All models are short-circuit, open-circuit, over-voltage and transient-protected; some models are also thermal and reverse polarity protected. These ballasts are light (less than 3 lbs.), compact and easy to install.

Triad manufactures DC ballasts for all types of lamps, from rapid-start, instant-start and pre-heat lamps to multiple tube applications; for tube currents from 120 to 400 mA and input voltages from 12 to 72 VDC.

## *Value-Added Services*

From simple assemblies such as lead terminations to fully-assembled, ready-to-install power supplies, Triad-Utrad provides a number of services. Among these are automated and non-automated assembly, PCB stuffing and complete outsourcing and procurement services.

TRIAD-UTRAD
A Division of MagneTek, Inc.

**TRIAD-UTRAD**
A Division of MagneTek Inc.

Triad-Utrad, a division of MagneTek, Inc., has provided industry with technology and research that have helped man explore the ocean depths...that have helped man reach the moon and beyond. This same commitment to technological innovation assures industry of the very highest quality transformers, inductors and power supplies to meet any commercial or military requirements.

But Triad's commitment does not end with quality. The huge, multimillion-dollar factory inventory assures fast delivery of most any transformer you need—from Triad's new Quick Pack™ with quick connect termination to all kinds of power transformers, audio and pulse transformers, toroidal inductors, DC power supplies, low frequency components, filter reactors and more.

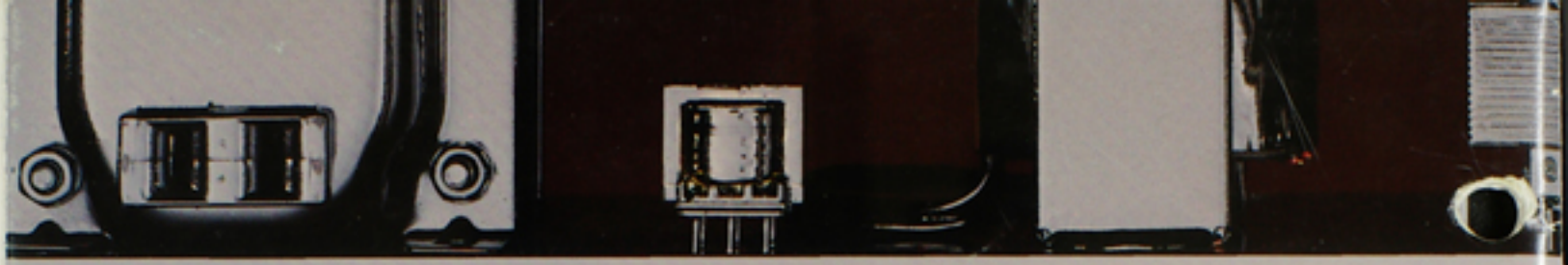
Inventory control is computer-assisted to help assure immediate and accurate stock checks and to keep updated delivery dates at the touch of a finger.

Custom requirements receive fast engineering and production to meet your specification or application requirements.

Whatever your need, Triad assures you the very best in quality...in product versatility ...in competitive pricing...and in fast delivery.

(Top) Plants 1 & 2—100,000 sq. ft. Plant 1 houses transformer/battery charger production. Plant 2 houses AC ballasts, DC ballasts and power supply production.

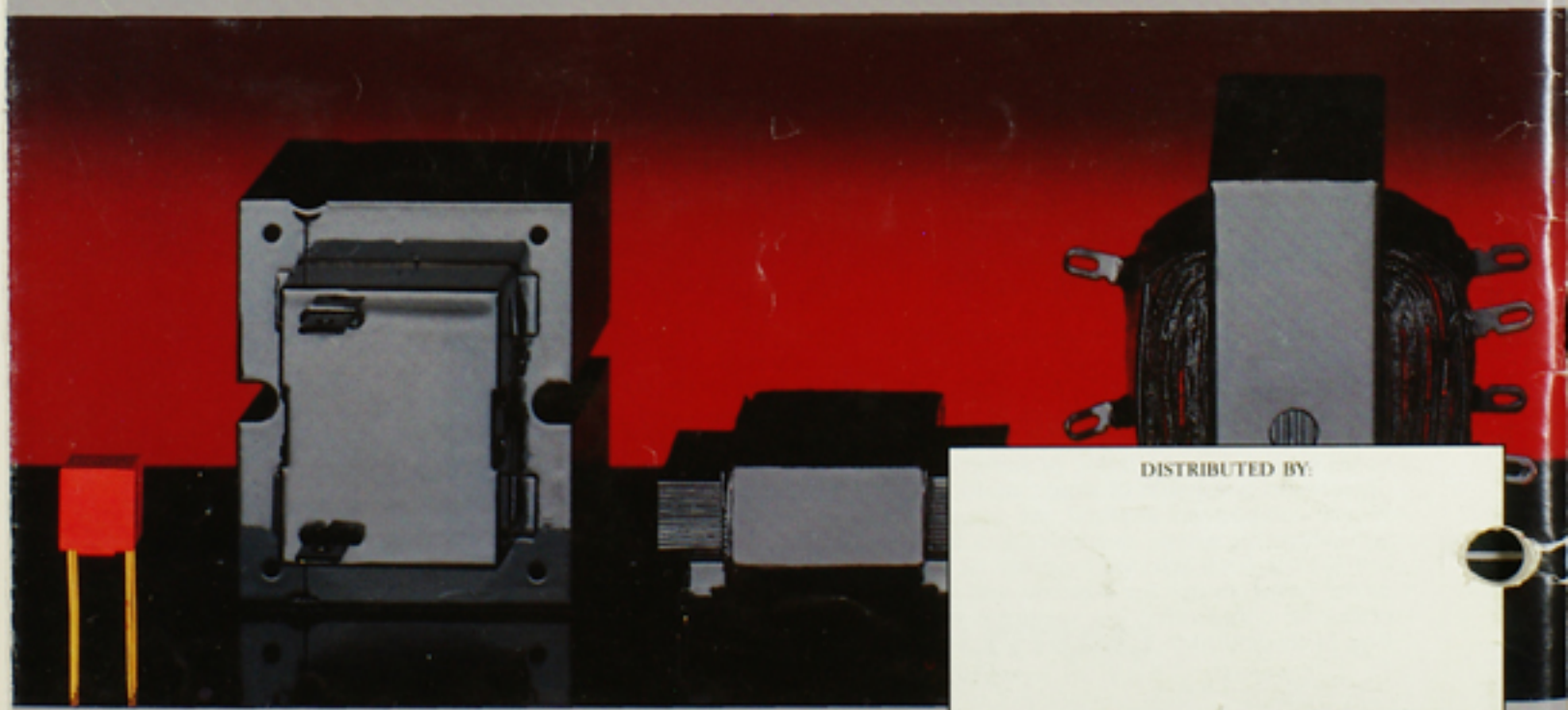
(Bottom) Plant 3 houses Standard Products raw material storage, finished product warehousing and office facilities—55,000 sq. ft.



*Triad gets wound up in your ideas*

**TRIAD-UTRAD**
A Division of Magnetek Inc.


**305 North Briant Street**
**P.O. Box A**
**Huntington, IN 46750**
**219-356-7100**
**TWX 810-333-1532**

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