http://waterheatertimer.org/Buck-boost-transformers.html#industral

# Industrial Control Circuit Transformer

**Features**

1. Epoxy-encapsulated (50-750 VA) epoxy resin impregnated (1.0 - 5.0 KVA). Completely seals the transformer coils against moisture, dust, dirt and industrial contaminants for maximum protection in hostile and industrial environments.
2. Fuse clips (most models). Factory-mounted for integral fusing on the secondary side to save panel space, save wiring time and save the space, save wiring time and save the cost of buying an add-on fuse block.
3. Integrally-molded barriers. Between terminals and between terminals and transformer protect against electrical creepage. Up to 30% greater terminal contact area permits low-loss connections. Extra-deep barriers reduce the chance of shorts from frayed leads or careless wiring.
4. Terminals. Molded into the transformer and virtually impossible to break during wiring. A full quarter-inch of thread on the 10-32 terminal screws pre - vents stripping and pullout.
5. Ten year warranty At no additional cost.
6. Jumpers supplied. Two jumpers links are standard with all transformers which can be jumpered.

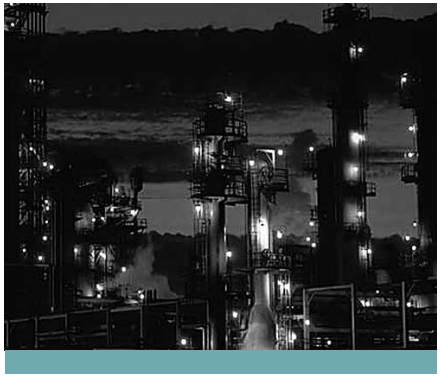
**Operation**

Industrial control circuits and motor control loads typically require more current when they are initially energized than under normal operating conditions. This period of high current demand, referred to as inrush, may be as great as ten times the current required under steady state (normal) operating conditions, and can last up to 40 milliseconds. A transformer in a circuit subject to inrush will typically attempt to provide the load with the required current during the inrush period. However, it will be at the expense of the secondary voltage stability by allowing the voltage to the load to decrease as the current increases. This period of secondary voltage instability, resulting from increased inrush current, can be of such a magnitude that the transformer is unable to supply sufficient voltage to energize the load. The transformer must therefore by designed and constructed to accommodate the high inrush current, while maintaining secondary voltage stability.

According to NEMA standards, the secondary voltage should typically be at 85% of the rated voltage.

Industrial Control Circuit Transformers are specifically designed and built to provide adequate voltage to the load while accommodating the high current levels present at inrush. These transformers deliver excellent secondary voltage regulation and meet or exceed the standards established by NEMA, ANSI, IL and CSA.Their hearty construction and excellent electrical characteristics provide reliable operation of electromagnetic devices and trouble-free performance.

# Selection Process



Selecting a transformer for industrial control circuit applications requires knowledge of the following terms:

**Inrush VA** is the product of load voltage (V) multiplied by the current (A) that is required during circuit start-up. It is calculated by adding the inrush VA requirements of all devices (contactors, timers, relays, pilot lights, solenoids, etc.), which will be energized together. Inrush VA requirements are best obtained from the component manufacturer.

**Sealed VA** is the product of load voltage (V) multiplied by the current (A) that is required to operate the circuit after initial start-up or under normal operating conditions. It is calculated by adding the sealed VA requirements of all electrical components of the circuit that will be energized at any given time. Sealed VA requirements are best obtained from the component manufacturer. Sealed VA is also referred to as steady state VA.

**Primary Voltage** is the voltage available from the electrical distribution system and its operational frequency, which is connected to the transformer supply voltage terminals.

**Secondary Voltage** is the voltage required for load operation which is connected to the transformer load voltage terminals.


Once the circuit variables have been determined, transformer selection is a simple 5-step process as follows:

1. Determine the Application Inrush VA by using the following industry accepted formula:

$$\text{Application Inrush VA} = \sqrt{(\text{Inrush VA})^2 + (\text{Sealed VA})^2}$$

2. Refer to the Regulation Chart. If the primary voltage is basically stable and does not vary by more than 5% from nominal, the 90% secondary voltage column should be used. If the primary voltage carries between 5% and 10% of nominal, the 95% secondary voltage column should be used.
3. After determining the proper secondary voltage column, read down until a value equal to or greater than the Application Inrush VA is found. In no case should a figure less than the Application Inrush VA be used.
4. Read left to the Transformer VA Rating column to determine the proper transformer for this application. As a final check, make sure that the Transformer VA Rating is equal to or greater then the total sealed requirements. If not, select a transformer with a VA rating equal to or greater than the total sealed VA.
5. Refer to the following pages to determine the proper catalog number based on the transformer VA, and primary and secondary voltage requirements.

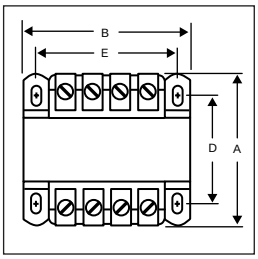
### Regulation Chart

| Transformer VA Rating | Inrush VA at 20% Power Factor | | |
|---|---|---|---|
| | 95% Secondary Voltage | 90% Secondary Voltage | 85% Secondary Voltage |
| 25 | 100 | 130 | 150 |
| 50 | 170 | 200 | 240 |
| 75 | 310 | 410 | 540 |
| 100 | 370 | 540 | 730 |
| 150 | 780 | 930 | 1150 |
| 200 | 810 | 1150 | 1450 |
| 250 | 1400 | 1900 | 2300 |
| 300 | 1900 | 2700 | 3850 |
| 500 | 4000 | 5300 | 7000 |
| 750 | 8300 | 11000 | 14000 |
| 1000 | 9000 | 13000 | 18500 |
| 1500 | 10500 | 15000 | 20500 |
| 2000 | 17000 | 25500 | 34000 |
| 3000 | 24000 | 36000 | 47500 |
| 5000 | 55000 | 92500 | 115000 |

To comply with NEMA standards which require all magnetic devices to operate successfully at 85% of rated voltage, the 90% secondary voltage column is most often used in selecting a transformer.

# Specifications


- Laminations are of the finest silicon steel to minimize core losses and to increase optimum performance and efficiency.
- Copper magnet wire of the highest quality assures efficient operation.
- Factory mounted type "K" fuse clips are standard on all single secondary transformers.
- Two jumper lines are standard with all transformers which can be jumpered.
- Optional type "M" fuse clips available for separate mounting.
- UL listed and CSA certified.
- 50/60 Hz rated.
- Insulation materials are of the highest rating available for the temperature class.
- Mounting brackets are heavy gauge steel to add strength to core construction and provide stable mounting. Slotted mounting feet permit easy installation.
- Attractive black finish: easy-to-read nameplate with complete rating data and wiring diagram.

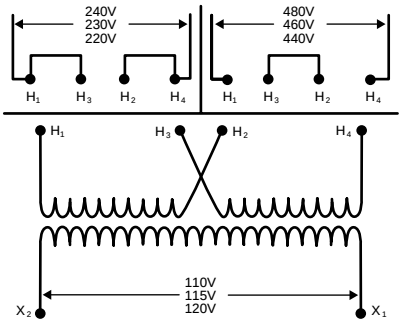



**Top View**



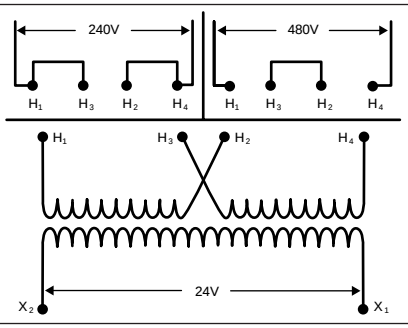

**Side View**

| Primary Volts 240x 480, 230 x 460, 220 x 240 | | | | Secondary Volts 120/115/110 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Ampere | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050A | 50 | 55°C | 0.43 | 3 | 3 | 2 9/16 | 2 | 2 ½ | 13/64 x 3/8 | 2.6 |
| MT0075A | 75 | 55°C | 0.65 | 3 ½ | 3 | 2 9/16 | 2 ½ | 2 ½ | 13/64 x 3/8 | 3.5 |
| MT0100A | 100 | 55°C | 0.87 | 3 3/8 | 3 3/8 | 2 7/8 | 2 3/8 | 2 13/16 | 13/64 x 3/8 | 4.2 |
| MT0150A | 150 | 55°C | 1.30 | 4 | 3 3/4 | 3 3/16 | 2 7/8 | 3 1/8 | 13/64 x 3/8 | 6.7 |
| MT0200A | 200 | 55°C | 1.74 | 4 | 4 ½ | 3 13/16 | 2 ½ | 3 3/4 | 13/64 x 3/8 | 8.5 |
| MT0250A | 250 | 55°C | 2.17 | 4 3/8 | 4 ½ | 3 13/16 | 2 7/8 | 3 3/4 | 13/64 x 3/8 | 10.0 |
| MT0300A | 300 | 55°C | 2.61 | 4 3/4 | 4 ½ | 3 13/16 | 3 1/4 | 3 3/4 | 13/64 x 3/8 | 11.3 |
| MT0350A | 350 | 55°C | 3.04 | 5 1/4 | 4 ½ | 3 13/16 | 3 3/4 | 3 3/4 | 13/64 x 3/8 | 13.6 |
| MT0500A | 500 | 55°C | 4.35 | 5 ½ | 5 1/4 | 4 3/4 | 4 1/4 | 4 3/8 | 5/16 x 11/16 | 19.2 |
| MT0750A | 750 | 55°C | 6.52 | 7 | 5 1/4 | 4 3/4 | 5 3/4 | 4 3/8 | 5/16 x 11/16 | 28.1 |
| MT1000A | 1000 | 115°C | 8.70 | 7 7/8 | 5 1/4 | 4 7/16 | 5 ½ | 4 3/8 | 9/32 x 13/32 | 29.8 |
| MT1500A | 1500 | 115°C | 13.04 | 6 3/4 | 6 3/4 | 5 11/16 | 3 9/16 | 6 1/16 | 9/32 x 13/32 | 30.0 |
| MT2000A | 2000 | 115°C | 17.39 | 7 | 6 3/4 | 5 11/16 | 4 7/16 | 6 1/16 | 9/32 x 13/32 | 38.0 |
| MT3000A | 3000 | 115°C | 26.09 | 7 ½ | 9 | 7 9/16 | 4 1/8 | 6 ½ | 7/16 x 3/4 | 53.0 |
| MT5000A | 5000 | 115°C | 43.48 | 7 3/4 | 9 | 7 9/16 | 6 | 6 ½ | 7/16 x 3/4 | 89.0 |

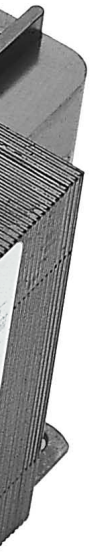



Includes secondary fuse clip on sizes 50 through 750VA.

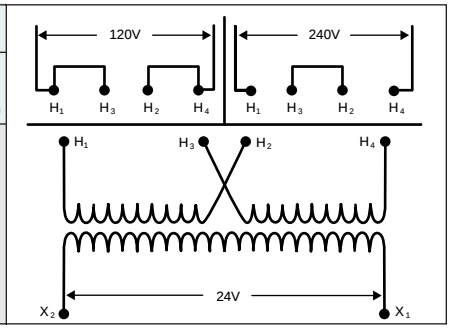
| Primary Volts 240x 480 | | | | Secondary Volts 24 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Ampere | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050B | 50 | 55°C | 2.08 | 3 | 3 | 2 9/16 | 2 | 2 ½ | 13/64 x 3/8 | 2.7 |
| MT0075B | 75 | 55°C | 3.13 | 3 ½ | 3 | 2 9/16 | 2 ½ | 2 ½ | 13/64 x 3/8 | 3.5 |
| MT0100B | 100 | 55°C | 4.17 | 3 3/8 | 3 3/8 | 2 7/8 | 2 3/8 | 2 13/16 | 13/64 x 3/8 | 4.2 |
| MT0150B | 150 | 55°C | 6.25 | 4 | 3 3/4 | 3 3/16 | 2 7/8 | 3 1/8 | 13/64 x 3/8 | 6.7 |
| MT0200B | 200 | 55°C | 8.33 | 4 | 4 ½ | 3 13/16 | 2 ½ | 3 3/4 | 13/64 x 3/8 | 8.5 |
| MT0250B | 250 | 55°C | 10.42 | 4 3/8 | 4 ½ | 3 13/16 | 2 7/8 | 3 3/4 | 13/64 x 3/8 | 10.1 |
| MT0300B | 300 | 55°C | 12.50 | 4 3/4 | 4 ½ | 3 13/16 | 3 1/4 | 3 3/4 | 13/64 x 3/8 | 11.4 |
| MT0350B | 350 | 55°C | 14.58 | 5 1/4 | 4 ½ | 3 13/16 | 3 3/4 | 3 3/4 | 13/64 x 3/8 | 13.4 |
| MT0500B | 500 | 55°C | 20.83 | 5 3/8 | 5 1/4 | 4 3/4 | 4 1/8 | 4 3/8 | 5/16 x 11/16 | 17.5 |




Includes secondary fuse clip on sizes 50 through 500VA.

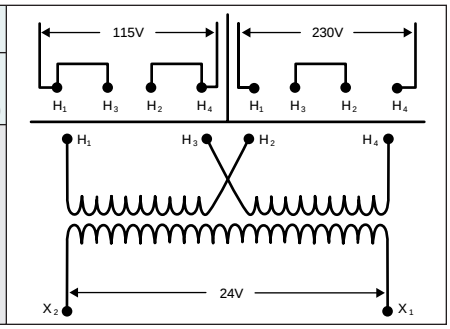


| Primary Volts 120x 240 | | | | Secondary Volts 24 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Ampere | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050C | 50 | 55°C | 2.08 | 3 | 3 | 2 9⁄16 | 2 | 2 ½ | 13⁄64 x 3⁄8 | 2.6 |
| MT0075C | 75 | 55°C | 3.13 | 3 ½ | 3 | 2 9⁄16 | 2 ½ | 2 ½ | 13⁄64 x 3⁄8 | 3.6 |
| MT0100C | 100 | 55°C | 4.17 | 3 3⁄8 | 3 3⁄8 | 2 7⁄8 | 2 3⁄8 | 2 13⁄16 | 13⁄64 x 3⁄8 | 4.4 |
| MT0150C | 150 | 55°C | 6.25 | 4 | 3 3⁄4 | 3 13⁄16 | 2 7⁄8 | 3 1⁄8 | 13⁄64 x 3⁄8 | 6.7 |
| MT0200C | 200 | 55°C | 8.33 | 4 | 4 ½ | 3 13⁄16 | 2 ½ | 3 3⁄4 | 13⁄64 x 3⁄8 | 8.3 |
| MT0250C | 250 | 55°C | 10.42 | 4 3⁄8 | 4 ½ | 3 13⁄16 | 2 7⁄8 | 3 3⁄4 | 13⁄64 x 3⁄8 | 10.1 |
| MT0300C | 300 | 55°C | 12.50 | 4 3⁄4 | 4 ½ | 3 13⁄16 | 3 1⁄4 | 3 3⁄4 | 13⁄64 x 3⁄8 | 11.2 |
| MT0350C | 350 | 55°C | 14.58 | 5 1⁄4 | 4 ½ | 3 13⁄16 | 3 3⁄4 | 3 3⁄4 | 13⁄64 x 3⁄8 | 13.2 |
| MT0500C | 500 | 55°C | 20.83 | 5 ½ | 19 1⁄8 | 4 3⁄4 | 4 1⁄4 | 4 3⁄8 | 5⁄16 x 11⁄16 | 19.2 |



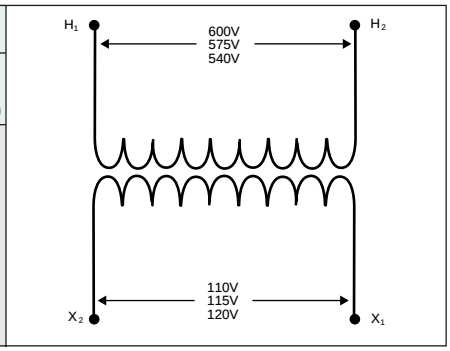

Includes secondary fuse clip on sizes 50 through 500VA.

| Primary Volts 115x 230 | | | | Secondary Volts 24 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Ampere | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050D | 50 | 55°C | 2.08 | 3 | 3 | 2 9⁄16 | 2 | 2 ½ | 13⁄64 x 3⁄8 | 2.7 |
| MT0075D | 75 | 55°C | 3.13 | 3 ½ | 3 | 2 9⁄16 | 2 ½ | 2 ½ | 13⁄64 x 3⁄8 | 3.7 |
| MT0100D | 100 | 55°C | 4.17 | 3 3⁄8 | 3 3⁄8 | 2 7⁄8 | 2 3⁄8 | 2 13⁄16 | 13⁄64 x 3⁄8 | 4.3 |
| MT0150D | 150 | 55°C | 6.25 | 4 | 3 3⁄4 | 3 3⁄16 | 2 7⁄8 | 3 1⁄8 | 13⁄64 x 3⁄8 | 6.8 |
| MT0200D | 200 | 55°C | 8.33 | 4 | 4 ½ | 3 13⁄16 | 2 ½ | 3 3⁄4 | 13⁄64 x 3⁄8 | 8.5 |
| MT0250D | 250 | 55°C | 10.42 | 4 3⁄8 | 4 ½ | 3 13⁄16 | 2 7⁄8 | 3 3⁄4 | 13⁄64 x 3⁄8 | 10.1 |
| MT0300D | 300 | 55°C | 12.50 | 4 3⁄4 | 4 ½ | 3 13⁄16 | 3 1⁄4 | 3 3⁄4 | 13⁄64 x 3⁄8 | 11.4 |
| MT0350D | 350 | 55°C | 14.58 | 5 1⁄4 | 4 ½ | 3 13⁄16 | 3 3⁄4 | 3 3⁄4 | 13⁄64 x 3⁄8 | 13.4 |
| MT0500D | 500 | 55°C | 20.83 | 5 ½ | 19 1⁄8 | 4 3⁄4 | 4 1⁄4 | 4 3⁄8 | 5⁄16 x 11⁄16 | 19.2 |



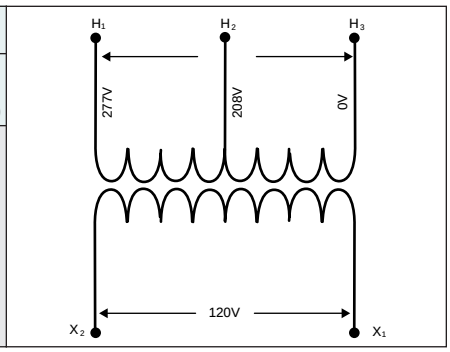

Includes secondary fuse clip on sizes 50 through 500VA.

| Primary Volts 540/575/600 | | | | Secondary Volts 110/115/120 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Ampere | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050E | 50 | 55°C | 0.43 | 3 | 3 | 2 9⁄16 | 2 | 2 ½ | 13⁄64 x 3⁄8 | 2.7 |
| MT0075E | 75 | 55°C | 0.65 | 3 ½ | 3 | 2 9⁄16 | 2 ½ | 2 ½ | 13⁄64 x 3⁄8 | 3.6 |
| MT0100E | 100 | 55°C | 0.87 | 3 3⁄8 | 3 3⁄8 | 2 7⁄8 | 2 3⁄8 | 2 13⁄16 | 13⁄64 x 3⁄8 | 4.2 |
| MT0150E | 150 | 55°C | 1.30 | 4 | 3 3⁄4 | 3 3⁄16 | 2 7⁄8 | 3 1⁄8 | 13⁄64 x 3⁄8 | 6.8 |
| MT0200E | 200 | 55°C | 1.74 | 4 | 4 ½ | 3 13⁄16 | 2 ½ | 3 3⁄4 | 13⁄64 x 3⁄8 | 8.4 |
| MT0250E | 250 | 55°C | 2.17 | 4 3⁄8 | 4 ½ | 3 13⁄16 | 2 7⁄8 | 3 3⁄4 | 13⁄64 x 3⁄8 | 10.0 |
| MT0300E | 300 | 55°C | 2.61 | 4 3⁄4 | 4 ½ | 3 13⁄16 | 3 1⁄4 | 3 3⁄4 | 13⁄64 x 3⁄8 | 11.3 |
| MT0350E | 350 | 55°C | 3.04 | 5 1⁄4 | 4 ½ | 3 13⁄16 | 3 3⁄4 | 3 3⁄4 | 13⁄64 x 3⁄8 | 13.6 |
| MT0500E | 500 | 55°C | 4.35 | 5 3⁄8 | 5 1⁄4 | 4 3⁄4 | 4 1⁄4 | 4 3⁄8 | 5⁄16 x 11⁄16 | 16.8 |
| MT0750E | 750 | 55°C | 6.32 | 7 | 5 1⁄4 | 4 3⁄4 | 5 3⁄4 | 4 3⁄8 | 5⁄16 x 11⁄16 | 25.7 |




Includes secondary fuse clip on sizes 50 through 750VA.

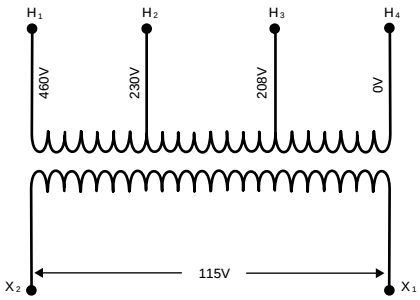
| Primary Volts 208/277 | | | | Secondary Volts 120 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Ampere | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050F | 50 | 55°C | 0.42 | 3 | 3 | 2 9⁄16 | 2 | 2 ½ | 13⁄64 x 3⁄8 | 2.9 |
| MT0075F | 75 | 55°C | 0.63 | 3 ½ | 3 | 2 9⁄16 | 2 ½ | 2 ½ | 13⁄64 x 3⁄8 | 3.8 |
| MT0100F | 100 | 55°C | 0.83 | 3 3⁄8 | 3 3⁄8 | 2 7⁄8 | 2 3⁄8 | 2 13⁄16 | 13⁄64 x 3⁄8 | 4.5 |
| MT0150F | 150 | 55°C | 1.25 | 4 | 3 3⁄4 | 3 13⁄16 | 2 7⁄8 | 3 1⁄8 | 13⁄64 x 3⁄8 | 6.9 |
| MT0200F | 200 | 55°C | 1.67 | 4 | 4 ½ | 3 13⁄16 | 2 ½ | 3 3⁄4 | 13⁄64 x 3⁄8 | 8.7 |
| MT0250F | 250 | 55°C | 2.08 | 4 3⁄8 | 4 ½ | 3 13⁄16 | 2 7⁄8 | 3 3⁄4 | 13⁄64 x 3⁄8 | 10.2 |
| MT0300F | 300 | 55°C | 2.50 | 4 3⁄4 | 4 ½ | 3 13⁄16 | 3 1⁄4 | 3 3⁄4 | 13⁄64 x 3⁄8 | 11.4 |
| MT0350F | 350 | 55°C | 2.92 | 5 1⁄4 | 4 ½ | 3 13⁄16 | 3 3⁄4 | 3 3⁄4 | 13⁄64 x 3⁄8 | 13.7 |
| MT0500F | 500 | 55°C | 4.17 | 5 3⁄8 | 5 1⁄4 | 4 3⁄4 | 4 1⁄8 | 4 3⁄8 | 5⁄16 x 11⁄16 | 17.2 |
| MT0750F | 750 | 55°C | 6.25 | 7 | 5 1⁄4 | 4 3⁄4 | 5 3⁄4 | 4 3⁄8 | 5⁄16 x 11⁄16 | 25.7 |




Includes secondary fuse clip on sizes 50 through 750VA.

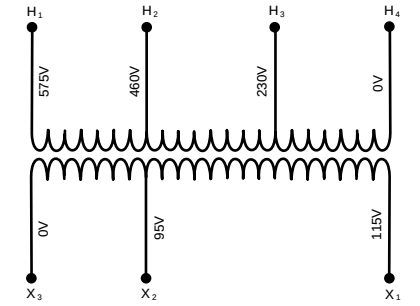
# Specifications

| Primary Volts 208/230/460 | | | | Secondary Volts 115 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Amperes | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050G | 50 | 55°C | 0.43 | 3 1/8 | 3 | 2 9/16 | 2 1/8 | 2 1/2 | 13/64 x 3/8 | 2.8 |
| MT0075G | 75 | 55°C | 0.65 | 3 3/8 | 3 3/8 | 2 7/8 | 2 3/8 | 2 13/16 | 13/64 x 3/8 | 4.3 |
| MT0100G | 100 | 55°C | 0.87 | 3 11/16 | 3 3/8 | 2 7/8 | 2 11/16 | 2 13/16 | 13/64 x 3/8 | 4.9 |
| MT0150G | 150 | 55°C | 1.30 | 4 3/16 | 3 3/4 | 3 3/16 | 3 1/16 | 3 1/8 | 13/64 x 3/8 | 7.4 |
| MT0200G | 200 | 55°C | 1.74 | 4 1/4 | 4 1/2 | 3 13/16 | 2 3/4 | 3 3/4 | 13/64 x 3/8 | 9.4 |
| MT0250G | 250 | 55°C | 2.17 | 4 3/4 | 4 1/2 | 3 13/16 | 3 1/4 | 3 3/4 | 13/64 x 3/8 | 11.1 |
| MT0300G | 300 | 55°C | 2.61 | 5 1/4 | 4 1/2 | 3 13/16 | 3 3/4 | 3 3/4 | 13/64 x 3/8 | 13.6 |
| MT0350G | 350 | 55°C | 3.04 | 5 7/8 | 4 1/2 | 3 13/16 | 4 3/8 | 3 3/4 | 13/64 x 3/8 | 15.6 |
| MT0500G | 500 | 55°C | 4.35 | 6 | 5 1/4 | 4 3/4 | 4 3/4 | 4 3/8 | 5/16 x 11/16 | 21.0 |
| MT0750G | 750 | 55°C | 6.52 | 7 3/8 | 5 1/4 | 4 3/4 | 5 3/4 | 4 3/8 | 5/16 x 11/16 | 30.0 |
| MT1000G | 1000 | 115°C | 8.70 | 7 1/8 | 6 3/8 | 5 3/8 | 4 1/2 | 5 5/16 | 5/16 x 11/16 | 29.2 |
| MT1500G | 1500 | 115°C | 13.04 | 7 1/2 | 6 3/4 | 5 11/16 | 4 7/16 | 6 1/16 | 9/32 x 9/16 | 33.5 |
| MT2000G | 2000 | 115°C | 17.39 | 8 1/4 | 6 3/4 | 5 11/16 | 5 1/4 | 6 1/16 | 9/32 x 9/16 | 42.5 |
| MT3000G | 3000 | 115°C | 26.09 | 8 | 9 | 7 9/16 | 4 5/8 | 6 1/2 | 7/16 x 3/4 | 63.7 |
| MT5000G | 5000 | 115°C | 43.48 | 10 1/2 | 9 | 10 3/16 | 6 1/2 | 6 1/2 | 7/16 x 3/4 | 102.0 |



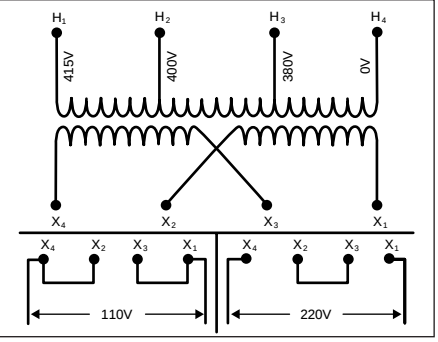

Includes secondary fuse clip on sizes 50 through 750VA.

| Primary Volts 230/460/575 | | | | Secondary Volts 95/115 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 95/115 | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Amperes | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050H | 50 | 55°C | .53/.44 | 3 | 3 | 2 9/16 | 2 3/16 | 2 1/2 | 13/64 x 3/8 | 3.5 |
| MT0075H | 75 | 55°C | .79/.65 | 3 3/8 | 3 3/8 | 2 7/8 | 2 3/8 | 2 13/16 | 13/64 x 3/8 | 4.5 |
| MT0100H | 100 | 55°C | 1.05/.87 | 3 7/8 | 3 3/8 | 2 7/8 | 2 7/8 | 2 13/16 | 13/64 x 3/8 | 6.0 |
| MT0150H | 150 | 55°C | 1.58/1.30 | 4 1/4 | 3 3/4 | 3 3/16 | 3 1/4 | 3 1/8 | 13/64 x 3/8 | 7.7 |
| MT0200H | 200 | 55°C | 2.11/1.74 | 4 1/4 | 4 1/2 | 3 13/16 | 2 3/4 | 3 3/4 | 13/64 x 3/8 | 9.0 |
| MT0250H | 250 | 55°C | 2.63/2.17 | 4 3/4 | 4 1/2 | 3 13/16 | 3 3/16 | 3 3/4 | 13/64 x 3/8 | 9.7 |
| MT0300H | 300 | 55°C | 3.16/2.61 | 5 1/8 | 4 1/2 | 3 13/16 | 3 5/8 | 3 3/4 | 13/64 x 3/8 | 11.7 |
| MT0350H | 350 | 55°C | 3.68/3.04 | 5 | 5 1/4 | 4 3/4 | 3 3/4 | 4 3/8 | 5/16 x 11/16 | 16.5 |
| MT0500H | 500 | 55°C | 5.26/4.35 | 5 7/8 | 5 1/4 | 4 3/4 | 4 5/8 | 4 3/8 | 5/16 x 11/16 | 21.5 |
| MT0750H | 750 | 55°C | 7.89/6.52 | 7 | 5 1/4 | 4 3/4 | 5 3/4 | 4 3/8 | 5/16 x 11/16 | 28.0 |
| MT1000H | 1000 | 115°C | 10.53/8.70 | 7 1/8 | 6 3/8 | 5 3/8 | 4 1/2 | 5 5/16 | 5/16 x 11/16 | 29.2 |
| MT1500H | 1500 | 115°C | 15.79/13.04 | 8 1/4 | 6 3/4 | 5 11/16 | 5 1/4 | 6 1/16 | 9/32 x 9/16 | 33.5 |
| MT2000H | 2000 | 115°C | 21.05/17.39 | 7 9/16 | 9 | 7 9/16 | 4 3/16 | 6 1/2 | 7/16 x 3/4 | 42.5 |
| MT3000H | 3000 | 115°C | 31.58/26.09 | 8 5/8 | 9 | 7 9/16 | 5 1/4 | 6 1/2 | 7/16 x 3/4 | 63.7 |
| MT5000H | 5000 | 115°C | 52.63/43.48 | 13 1/2 | 9 | 10 13/16 | 8 1/4 | 6 1/2 | 7/16 x 3/4 | 102.0 |



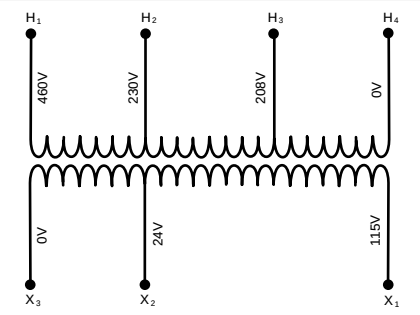

Does not include secondary fuse clip.

| Primary Volts 380/400/415 | | | | Secondary Volts 110/220 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 110/220V | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Amperes | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050I | 50 | 55°C | .455/.227 | 3 | 3 | 2 9/16 | 2 | 2 1/2 | 13/64 x 3/8 | 3.0 |
| MT0075I | 75 | 55°C | .68/.34 | 3 1/2 | 3 | 2 9/16 | 2 1/2 | 2 1/2 | 13/64 x 3/8 | 4.0 |
| MT0100I | 100 | 55°C | .91/.455 | 3 9/16 | 3 3/8 | 2 7/8 | 2 9/16 | 2 13/16 | 13/64 x 3/8 | 5.2 |
| MT0150I | 150 | 55°C | 1.37/6.85 | 4 | 3 3/4 | 3 3/16 | 2 7/8 | 3 1/8 | 13/64 x 3/8 | 7.0 |
| MT0200I | 200 | 55°C | 1.82/.91 | 4 | 4 1/2 | 3 13/16 | 2 1/2 | 3 3/4 | 13/64 x 3/8 | 8.7 |
| MT0250I | 250 | 55°C | 2.28/1.14 | 4 3/8 | 4 1/2 | 3 13/16 | 2 7/8 | 3 3/4 | 13/64 x 3/8 | 10.2 |
| MT0300I | 300 | 55°C | 2.72/1.36 | 4 3/4 | 4 1/2 | 3 13/16 | 3 1/4 | 3 3/4 | 13/64 x 3/8 | 11.0 |
| MT0350I | 350 | 55°C | 3.18/1.59 | 5 1/4 | 4 1/2 | 3 13/16 | 3 3/4 | 3 3/4 | 13/64 x 3/8 | 13.0 |
| MT0500I | 500 | 55°C | 4.55/2.27 | 5 3/8 | 5 1/4 | 4 3/4 | 4 1/8 | 4 3/8 | 5/16 x 11/16 | 20.0 |
| MT0750I | 750 | 55°C | 6.82/3.41 | 7 | 5 1/4 | 4 3/4 | 5 3/4 | 4 3/8 | 5/16 x 11/16 | 28.0 |




Does not include secondary fuse clip.

| Primary Volts 208/230/460 | | | | Secondary Volts 24/115 | | | | | | 50/60Hz |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 24/115V | Dimensions (inches) | | | | | | |
| Catalog Number | VA Rating | Temp. Rise | Output Amperes | "A" | "B" | "C" | "D" | "E" | Mounting Slots | Approx. Wt. (lbs) |
| MT0050J | 50 | 55°C | 2.08/.44 | 3 1/4 | 3 | 2 9/16 | 2 1/2 | 2 1/4 | 13/64 x 3/8 | 3.4 |
| MT0075J | 75 | 55°C | 3.13/.65 | 3 1/2 | 3 3/8 | 2 7/8 | 2 1/2 | 2 13/16 | 13/64 x 3/8 | 4.8 |
| MT0100J | 100 | 55°C | 4.17/.87 | 3 5/8 | 3 3/4 | 3 3/16 | 2 1/2 | 3 1/8 | 13/64 x 3/8 | 5.9 |
| MT0150J | 150 | 55°C | 6.51/1.30 | 4 3/8 | 3 3/4 | 3 3/16 | 3 1/4 | 3 1/8 | 13/64 x 3/8 | 7.9 |
| MT0200J | 200 | 55°C | 8.33/1.74 | 4 1/2 | 4 1/2 | 3 13/16 | 3 | 3 3/4 | 13/64 x 3/8 | 10.6 |
| MT0250J | 250 | 55°C | 10.42/2.17 | 5 1/4 | 4 1/2 | 3 13/16 | 3 3/4 | 3 3/4 | 13/64 x 3/8 | 13.9 |
| MT0300J | 300 | 55°C | 12.50/2.61 | 5 1/8 | 5 1/4 | 4 3/4 | 3 7/8 | 4 3/8 | 5/16 x 11/16 | 15.5 |
| MT0350J | 350 | 55°C | 14.58/3.04 | 5 3/8 | 5 1/4 | 4 3/4 | 4 1/8 | 4 3/8 | 5/16 x 11/16 | 16.8 |
| MT0500J | 500 | 55°C | 20.84/4.35 | 6 1/2 | 5 1/4 | 4 3/4 | 5 1/4 | 4 3/8 | 5/16 x 11/16 | 23.4 |




Includes secondary fuse clip on sizes 50 through 500VA.

# Glossary

**Air Cooled**
A transformer which uses air as the cooling method medium. Term is abbreviated with the ANSI designation AA indicating open, natural draft ventilated construction.

**Ambient Noise Level**
The inherent or existing noise level of the surrounding area measured in decibels.

**Ambient Temperature**
The inherent or existing temperature of surrounding atmosphere into which the heat of a transformer is dissipated. Transformers are designed for 30°C average ambient temperature with a 40° C maximum during any 24 hour period.

**Ampere**
A unit of electric current flow.

**ANSI**
American National Standards Institute, Inc.– a recognized organization which specifies the standards for transformers.

**ASTM**
American Society for Testing Materials.

**ATC**
Air Terminal Chamber. See Terminal Chamber.

**Attenuation**
A term used to denote a decrease in magnitude in transmission from one point to another. Typically expressed as a ratio or in decibels, as in electrical noise attenuation.

**Autotransformer**
A transformer with one winding per phase in which part of the winding is common to both the primary and the secondary circuits.

**Banked**
Two or more single phase transformers connected together to supply a three phase load.

**BIL**
Basic Impulse Level measures the ability of the insulation system to withstand high voltage surges.

**Buck-Boost**
Small KVA, two-winding transformers typically wired as an autotransformer to raise or lower single and three phase line voltages by 10 - 20%.

**Cast Coil Transformer**
Transformer with coils solidly case in epoxy resin under vacuum in a mold. Also called cast resin or epoxy cast coil transformer.

**Center Tap**
A reduced capacity tap at the mid-point in a winding. Also referred to as lighting tap.

**Certified Test**
Actual values taken during production testing which certify the values or results or testing to apply to a specific unit.

**Coil**
Turns of electrical grade wire or strip conductor material wound on a form; often referred to as winding.

**Common Mode**
Electrical noise or voltage disturbance that occurs between one of the line leads and the common ground, or between the ground plane and either the line or the neutral.

**Compensated Transformer**
A transformer with a turns ratio which provides a higher than rated voltage at no load and rated voltage at rated load. Such transformers cannot be used for reverse feed.

**Conductor Losses**
Losses in watts caused by the resistance of the transformer winding during a loaded condition. Also referred to as load loss or winding loss.

**Continuous Rating**
The constant load which a transformer can maintain indefinitely, at rated voltage and frequency, without exceeding its designed temperature rise.

**Control Transformer**
A transformer designed to provide good voltage regulation for control or instrumentation circuits having high inrush current or low power factor conditions.

**Copper Loss**
See load loss.

**Core**
Electrical grade steel laminations which carries the magnetic flux.

**Core Loss**
Losses in watts caused by magnetization of the core and its resistance to magnetic flux when excited or energized at rated voltage and frequency. Also referred to as excitation loss or no-load loss.

**Current Transformer**
Transformer generally used in control or instrumentation circuits for measuring current.

**Decibel (dB)**
A standard unit of measure of intensity.

**Delta**
A standard three phase connection with the ends of each phase winding connected in series to form a loop with each phase 120 degrees from each other. Also referred to as 3-wire.

**Delta-Wye**
A term or symbol indicating the primary connected in delta and the secondary in wye when pertaining to a three phase transformer or transformer bank.

**Dielectric Tests**
A series of tests conducted to verify effectiveness of insulation materials and clearances used between turns and layers in the winding.

**Distribution Transformer**
Generally referred to as any transformer rated 500 KVA and below, except for current, potential, or other specialty transformers.

**Dry Type**
A transformer without liquid for cooling.

**Dual Winding**
A winding consisting of two separate parts which can be connected in series or in parallel. Also referred to as dual voltage or series multiple winding.

**Electrostatic Shield**
Conductor material placed between the primary and secondary windings which is grounded to reduce electrical noise or line interference.

**Exciting Current**
"No-load current" flowing in the winding used to excite the transformer when all other windings are open--circuited. Usually expressed in percent of the rated current of a winding in which it is measured.

**Encapsulated**
Transformer with coils either encased or cast in an epoxy resin or other encapsulating materials.

**FCAN**
"Full Capacity Above Normal." A designation for no-load taps indicating the taps are suitable for full-rated KVA at the designated voltages above nominal voltage.

**FCBN**
Same as above except Full Capacity Below Normal.

**Fan Cooled**
Cooled mechanically to maintain rated temperature rise, typically using auxiliary fans to accelerate heat dissipation.

**Flexible Connection**
A non-rigid connection used to eliminate transmission of noise and vibration.

**Frequency**
Designates the number of times, or complete cycles, that polarity alternates from positive to negative per unit of time; as in 60 cycles per second. Also referred to as Hertz.

**Full Capacity Tap**
Tap than can deliver rated KVA without exceeding its designated temperature rise.

**Grounding Transformer**
A special 3 phase autotransformer used to establish a stable neutral point on a 3-wire delta system. Also referred to as Zig-Zag transformer.

**Grounding**
Connecting one side of a circuit to earth; or creating a conducting path to some conducting body that serves in place of earth through low-resistance or low-impedance paths.

**Hertz (Hz)**
A term for AC frequency in cycles per second.

**High Voltage Winding**
Designates the winding with the greater voltage; designated as HV on the nameplate and as H1, H2, etc. on the termination.

**Hi Pot**
High potential dielectric test impressed on the windings to check insulation materials and clearances.

**Impulse Tests**
Dielectric test which determines BIL capability by applying high frequency, steep wave-front voltage between windings and ground.

**Impedance**
Retarding or opposing forces of current flow in AC circuit, expressed in percentage.

**Induced Potential Test**
A high frequency dielectric test which verifies the integrity of insulating materials and electrical clearances between turns and layers of a winding.

**Inductance**
A property which opposes a change in current flow.

**Inrush Current**
Abnormally high current, caused by residual flux in the core, which is occasionally drawn when a transformer is energized.

**Insulating Transformer**
One which the primary winding connected to the input or source, is insulated from the secondary winding connected to the output or load. Also referred to as two-winding or isolation transformers, which isolate the primary circuit from the secondary circuit.

**Iron Loss**
See No Load Loss or Core loss.

**IR%**
Percent resistance. Voltage drop due to conductor resistance at rated current expressed in percent of rated voltage

**IX%**
Percent reactance. Voltage drop due to reactance at rated current expressed in percent of rated voltage.

**IZ%**
Percent impedance. Voltage drop due to impedance at rated current expressed in percent of rated voltage.

**KVA**
Kilovolt ampere rating with designates the capacity or output with a transformer can deliver at rated voltage and frequency without exceeding designed temperature rise. (1 KVA = 1000VA, or 1000 volt amperes).

**Lamination**
Thin sheets of special steel used to make the core of a transformer.

**Liquid Transformer**
A transformer which used mineral oil, or other dielectric fluid, which serves as an insulating and cooling medium.

**Load Losses**
Losses in watts which are the result of current flowing to the load. Also referred to as winding loss, copper loss, or conductor loss.

**Mid-tap**
A reduced capacity tap midway in a winding. Also referred to a Center tap; usually in the secondary winding.

**NEC**
National Electric Code.

**NEMA**
National Electrical Manufacturers Association.

**No-load Loss**
See core loss.

**Oil Cooled**
A transformer which uses oil as the cooling medium. Term is abbreviated with the ANSI designation OA indicating natural oil ambient ventilation.

**Parallel Operation**
Transformers having compatible design features with their appropriate terminals connected together.

**Phase**
Classification of an AC circuit; typically designated as single phase 2-wire or 3-wire, or three phase 3-wire or 4-wire.

**Polarity**
Designates the instantaneous direction of the voltages in the primary compared to the secondary.

**Potential Transformer**
A transformer generally used in instrumentation circuits for measuring or controlling voltage.

**Power Factor**
The relation of watts to volt amps in a circuit.

**Primary Rating**
The input, source, or supply side connected to the primary of the transformer in a circuit.

**Rating**
The design characteristics, such as primary and secondary voltage, KVA, capacity, temperature rise, frequency, etc.

**Ratio**
Refers to the turns ratio or the voltage ratio between the primary and secondary winding.

**Reactance**
The effect of inductive and capacitive components of a AC circuit producing other than unity power factor.

**Reactor**
A single winding device with an air or iron core which produces a specific amount of inductive reactance into a circuit, usually to reduce or control current.

**Reduced Capacity Taps**
Taps which are rated for winding current only (versus rated KVA), thus reducing available power because of lower output voltage.

**Regulation**
The percent change in secondary output voltage when the load changes from full load to no-load at a given power factor.

**Scott Connection**
A transformer connection generally used to get a two phase output from the secondary of a three phase input, or vice versa.

**Sealed Transformer**
An enclosed transformer completely sealed from the outside environment and usually contains pressurized inert gas.

**Secondary Rating**
The output, or load side connected to the secondary of the transformer in a circuit.

**Series/Multiple**
A winding consisting of two or more sections which can be connected for series operation or multiple (parallel) operation. Also referred to as dual voltage or series-parallel.

**Star Connection**
Same as wye connection.

**Step-down Transformer**
One in which the energy transfer is from the high voltage winding (primary input circuit) to the low voltage winding (secondary output or load circuit).

**Step-up Transformer**
The energy transfer is from the low voltage winding to the high voltage winding; with the low voltage winding connected to the power source (primary input circuit) and the high voltage connected to the load (secondary output circuit).

**T-connection**
Use of Scott connection for three phase operation using two primary (main) and two secondary (teaser) coils.

**Tap**
A connection brought out of winding at some point between its extremities to permit changing the nominal voltage ratio. Taps are usually located in the high voltage winding, typically expressed as FCAN and FCBN for no-load operation.

**Temperature Rise**
The increase over ambient temperature of the winding due to energizing and loading the transformer; typically measured as either average rise by resistance or as hot-spot.

**Terminal Chamber**
An enclosure with space for making connection to a substation transformer, typically used when the transformer is not direct connected or close coupled to another device.

**Total Losses**
The transformer electrical losses which include no-load losses (core loss) and load losses (winding losses).

**Turns Ratio**
See Ratio.

**Transformer**
A static electrical device which by electromagnetic induction transforms energy at one voltage or current to another at the same frequency.

**Transformer Tests**
Normal, routing production tests include: (1) core loss (excitation loss or non-load loss); (2) load loss – winding or copper loss; (3) Impedance; (4) Hi-pot – high voltage between windings and ground; (5) Induced – double induced two time normal voltage. Optional special tests include: (a) Heat Run – temperature testing; (b) Noise tests – sound level measurement (c) Impulse tests – BIL tests.

**Transverse Mode**
Electrical noise or voltage disturbance that occurs between phase and neutral, or from spurious signals across the metallic hot line and the neutral conductor.

**UL**
Underwriters Laboratories.

**Voltage Ratio**
See Ratio.

**Voltage Regulation**
The change in secondary voltage which occurs when the load is reduced from rated value to zero, with the values of all other qualities remaining unchanged. Regulation may be expressed in percent (per unit) on the basis or rated secondary voltage at full load.

**Winding Losses**
See Load Losses.

**Wye Connection**
A three phase connection with similar ends of each phase connected together at a common point which forms the electrical neutral point which is typically grounded.

**Zig-Zag**
Special transformer connection commonly used with grounding transformers. See also grounding transformers.