

## AT120A, AT140A, AT150A, AT175A Universal Transformers

### Application

These transformers are for use in 24 Vac nominal control circuits. They are typically used in heating/cooling control systems, but can be used in any application that does not exceed the load ratings. They meet National Electrical Code Class 2 "not wet" and Class 3 "wet" re-

quirements and are Underwriters Laboratories (UL) Inc. listed under UL 1585. They can be mounted through a 7/8 in. knockout on the accessory mounting plate (included), or with the integral mounting feet. See Table 1 for additional specifications.

TABLE 1—MODEL SPECIFICATIONS.

Model Number	Primary		Secondary			Output Rating at 100 Percent Power Factor
	Input Voltage (60 Hz)	Wiring Connections	Voltage		Wiring Connections	
			Open Circuit	At Rated Power Output		
AT120A	120/208/240	9 in. leads	27.0	24.0	Screw terminals	20 VA
AT140A	120	9 in. leads	27.0	24.0	Screw terminals	40 VA
	120/208/240					
	208/240					
AT150A	120/208/240	9 in. leads	27.5	24.0	Screw terminals	50 VA
AT175A	120/208/240	9 in. leads	27.5	24.0	Screw terminals	75 VA

### Installation

#### WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.



#### CAUTION

Disconnect power supply before beginning installation to prevent electrical shock or equipment damage.

The transformer may be mounted in one of three ways:

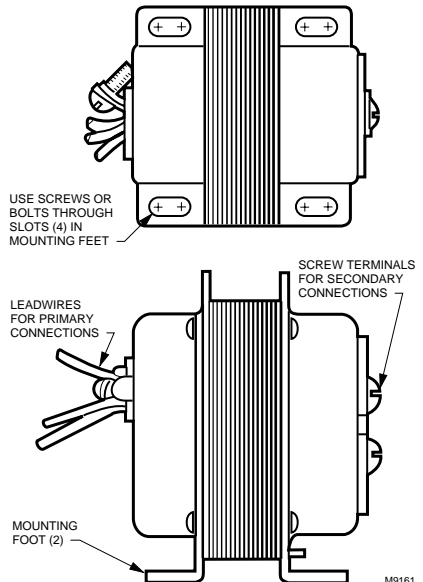
- foot mount,
- plate mount, or
- mount through outlet box knockout hole.

#### FOOT MOUNTING

Mount the transformer using screws (not supplied) through the four 3/16 in. x 3/8 in. holes in the mounting feet. Make line voltage primary connections within an approved enclosure. See Fig. 1.

Discard the mounting plate.

Fig. 1—Foot mounting.



## PLATE MOUNTING

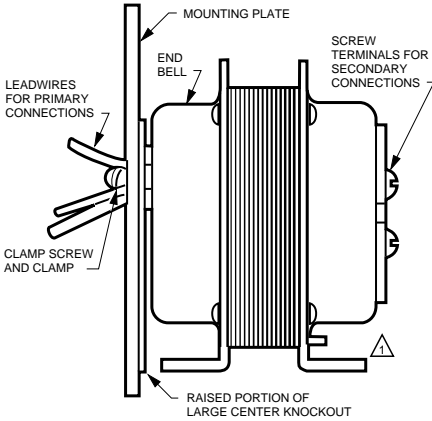
### Mounting Plate to Transformer

Mount the plate to the transformer in either of two positions (see Fig. 2):

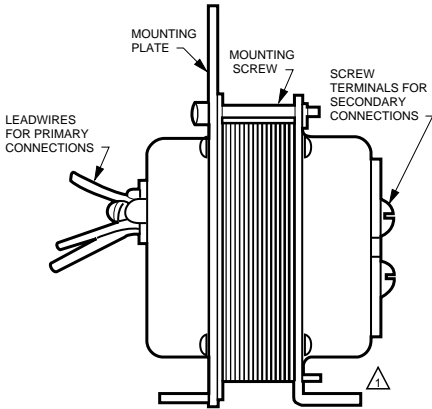
- at the clamp on the primary end bell, or
- at the laminations.

**Fig. 2—Plate may be mounted to transformer in either of two position.**

#### PLATE MOUNTED AT CLAMP ON PRIMARY END BELL



#### PLATE MOUNTED AT THE LAMINATIONS

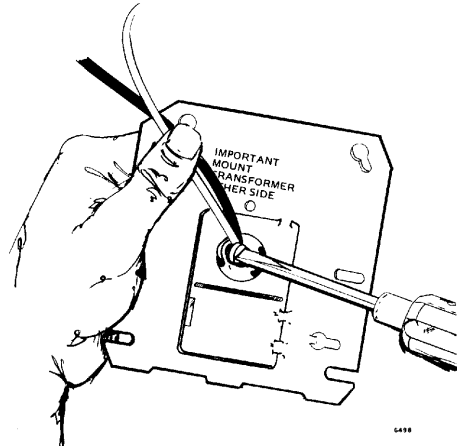


⚠ MOUNTING FEET ON "A" MODELS ONLY. M9162

### To mount the plate at the primary end bell:

- Turn the screw on the clamp almost all the way out.
- Hold the mounting plate with the keyhole slots up and the raised portion of large center knockout away from you.
- From the back, thread the primary leadwires through the round center hole in the plate.
- Fit the clamp and screw through the round hole.
- While holding the plate in place, tighten the setscrew securely against the rim of the hole. See Fig. 3. Avoid damaging the leadwires with the screwdriver.

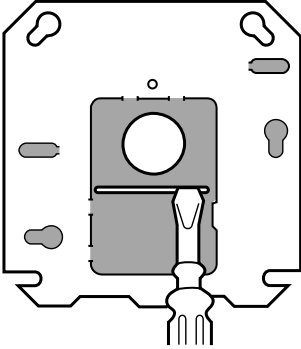
**Fig. 3—When screw is tightened, clamp holds plate on transformer.**



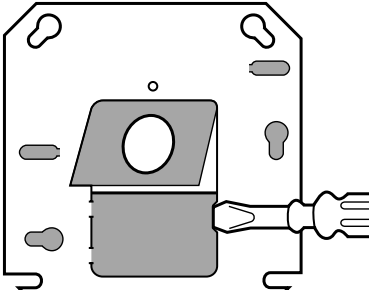
**Fig. 4—Use screwdriver to pry out both sections of knockout.**

WITH RAISED PORTION OF KNOCKOUTS FACING YOU:

1. PRY UP TOP SECTION OF LARGE KNOCKOUT BY INSERTING SCREWDRIVER FIRST AT ONE SIDE OF SLOT AND THEN AT THE OTHER SIDE.



2. THEN PRY UP BOTTOM SECTION OF KNOCKOUT.



3. REMOVE BOTH SECTIONS OF KNOCKOUT WITH PLIERS.

SHADED AREAS REPRESENT KNOCKOUTS AND SCREW SLOTS USED WITH 2 X 4 INCH OR OCTAGONAL OUTLET BOXES.

M9188

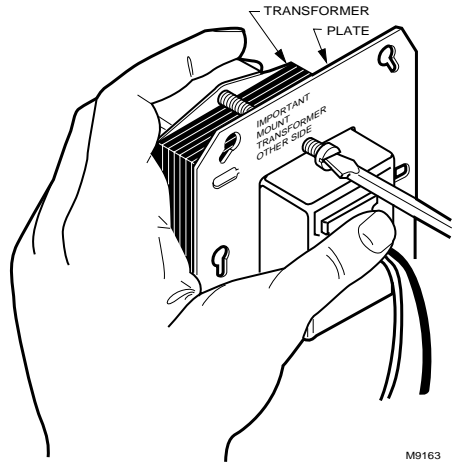
#### To mount the plate at the laminations:

1. Remove the large rectangular knockout in the mounting plate as shown in Fig. 4.
2. Hold the transformer so the clamp on the end bell faces you.
3. With the keyhole slots up, fit the mounting plate over the primary leadwires and end bell. Insert small tab at the bottom of the plate into the slot in the transformer mounting foot.
4. Insert the mounting screw (supplied) through the holes as shown in Fig. 5. Secure the plate to the transformer, but do not overtighten the screw.

#### Mounting Transformer and Plate on Outlet Box

The mounting plate may be mounted on 4 in. square boxes, 2 x 4 in. rectangular boxes, and on 4 in. octagonal boxes. See Fig. 4.

**Fig. 5—Mounting screw and tab hold plate on transformer.**



1. Align the plate with the box to determine the proper mounting holes. The mounting feet and secondary terminals will be outside the box.
2. Remove the mounting hole knockouts if necessary.
3. Mount the plate on the outlet box using two screws (obtained locally).

#### MOUNTING THROUGH OUTLET BOX KNOCKOUT

The transformer can be mounted on an outlet box using the clamp on the primary end bell. The mounting plate is not used. To mount the transformer on an outlet box:

1. Turn the clamp screw almost all the way out.
2. From outside box, thread the primary leadwires through suitable 7/8 in. knockout. Fit the clamp and screw through the knockout. Do not mount the transformer through a plastic knockout.
2. Tighten the clamp screw securely against the rim of the knockout. Avoid damaging the leadwires with the screwdriver.

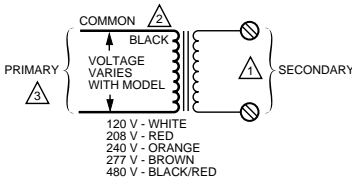
#### WIRING

All wiring must comply with local codes and ordinances. Disconnect power before making wiring connections to prevent electrical shock or equipment damage.

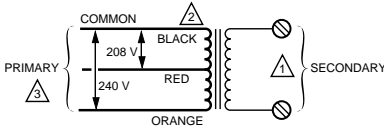
1. Make primary connections to the line voltage power supply. On multitap models, be sure to use correct leads for available power supply. See Fig. 6.
2. On multitap models, insulate the ends of the unused leads using wire nuts or capping with a solderless connector.
3. Make secondary connections to 24 Vac control circuit.

**Fig. 6—Schematics for single and multitap transformers.**

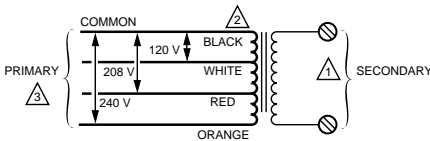
### SINGLE VOLTAGE MODELS



### 208/240 VAC MODELS



### 120/208/240 VAC MODELS



1 SECONDARY CONNECTIONS ARE SCREW TERMINALS, 1/4 INCH QUICK-CONNECTS OR BLUE AND YELLOW LEADWIRES.

2 BLACK IS COMMON WITH RESPECT TO THE TRANSFORMER WINDING ONLY AND NOT THE EXTERNAL CIRCUIT.

3 SOME MODELS AVAILABLE WITH 1/4 INCH QUICK CONNECTS. M9182

## ! CAUTION

Do not short transformer secondary terminals. Overload current protection is inherent on AT120, AT140, and AT150. A fused 3.5 Amp secondary is used on AT175.

### VOLTAGE CHECK

After installation is complete, turn on power supply and perform a voltage check.

1. Place controlled equipment in operation and observe through one complete cycle.
2. Using a voltmeter, assure proper primary and secondary voltages exist.
3. If voltage readings are incorrect, assure primary voltage connections are made properly.
4. Measure voltage again.
  - If proper primary voltage is measured and secondary voltage is significantly less than the voltage shown on the regulation curves, transformer winding is damaged. Replace transformer and repeat checkout procedures.
  - If primary voltage is 0V, assure power supply is connected properly or repair if necessary. Repeat checkout procedures.
5. Do not put system into operation unless correct primary and secondary voltages are measured.