

# INSTALLATION INSTRUCTIONS

## Observer® Zoning Panel ZONE0101ZP6

These instructions must be read and understood completely before attempting installation

### Safety Labeling and Signal Words

#### DANGER, WARNING, CAUTION, and NOTE

The signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING**, **CAUTION**, and **NOTE** will be used on product labels and throughout this manual and other manual that may apply to the product.

**DANGER** – Immediate hazards which will result in severe personal injury or death.

**WARNING** – Hazards or unsafe practices which could result in severe personal injury or death.

**CAUTION** – Hazards or unsafe practices which may result in minor personal injury or product or property damage.

**NOTE** – Used to highlight suggestions which will result in enhanced installation, reliability, or operation.

#### Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:

 **WARNING**

The signal word **CAUTION** is used throughout this manual in the following manner:

 **CAUTION**

#### Signal Words on Product Labeling

Signal words are used in combination with colors and/or pictures or product labels.

 **WARNING**

#### PERSONAL INJURY, AND/OR PROPERTY DAMAGE HAZARD

Failure to carefully read and follow this warning could result in equipment malfunction, property damage, personal injury and/or death.

Installation or repairs made by unqualified persons could result in equipment malfunction, property damage, personal injury and/or death.

The information contained in this manual is intended for use by a qualified service technician familiar with safety procedures and equipped with proper tools and test instruments.

Installation must conform with local building codes and with the national Electrical Code NFPA70 current edition or Canadian Electrical Code part 1 CSA C.22.1. The National Fuel Gas Code (NFGC) NFPA 54/ANSI Z223.1, and in Canada refer to the current editions of the National Standards of Canada CAN/CSA-B149.1 and .2 Natural Gas and Propane Installation codes.

 **WARNING**

#### ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing or servicing system, always turn off main power to system and install lockout tag. There may be more than one disconnect switch.

 **CAUTION**

#### CUT HAZARD

Failure to follow this warning could result in personal injury.

When removing access panels or performing maintenance functions inside your unit, be aware of sharp sheet metal parts and screws. Although special care is taken to reduce sharp edges to a minimum, be extremely careful and wear appropriate clothing, safety glasses, and gloves when handling parts or reaching into the unit.


**NOTE:** Read the entire instruction manual before starting the installation.

## SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes, the current editions of the National Fuel Gas Code (NFGC) NFPA 54/ANSI Z223.1, and the National Electrical Code (NEC) NFPA 70.

In Canada refer to the current editions of the National Standards of Canada CAN/CSA-B149.1 and .2 Natural Gas and Propane Installation codes, and Canadian Electrical Code CSA C22.1

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words: DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

## INSTALLATION CONSIDERATIONS

This instruction covers the physical installation and startup of the Observer® Zoning System and Zoning Panel. Use this instruction to guide the actual installation process **AFTER** all the air side decisions have been made. One Zoning Panel is capable of handling up to six zones of operation.

Before the actual installation of a zoning system can begin, decisions need to be made to determine the HVAC equipment to be used with the zoning system, and the number and location of zones and sensors. This affects zoning system duct layout, duct sizing, and damper selections.

1. Consult local building and energy codes for proper application of zoning systems. For example, California's *2013 Building Energy Efficiency Standards for Residential and nonresidential Buildings – Revised* (aka. "Title 24").
2. Proper equipment selection and duct sizing are important in a zoned system.
  - a. Consult industry-standard resources for duct and zoning design. ACCA Manual D (duct design) and Manual Zr (residential zoning system design) are excellent resources.
  - b. Multiple-stage indoor and outdoor HVAC equipment are best suited for zoning applications. The zoning system can use the multiple stages of equipment operation to better match the demands of the zoning system, especially when only one or two zones are calling for conditioning.
  - c. A TXV is required on the indoor coil when used with all residential split system equipment. This

allows the HVAC system to better respond to the changing airflow and capacity demands of the zoning system.

- d. See the Observer Wall Control specification sheet for the specifications for dampers to be used with the Observer Zoning System and Zone Panel.
  - e. ALWAYS use the Leaving Air Sensor (aka. Duct Temperature Sensor) with the Observer Zoning System.
3. System static pressure and airflow regulation – bypass duct or dump zone?
    - a. Indoor HVAC equipment featuring a full-feature (aka. fully-communicating) ECM blower motor provide CFM control features and are best for zoning systems. Typically, these are the modulating gas furnaces and the FCM-style air handlers. See the equipment specification sheets for more information. These may be installed with either a barometric bypass damper installed in the bypass duct, or with a powered damper used to control airflow to a dump zone.
    - b. Indoor units with all other types of blower motors—for example, multi-tap ECM (aka "X-13"), PWM and PSC—should be used with a barometric bypass damper, installed to bypass airflow directly from the supply plenum to the return plenum (aka. bypass duct). Allow as much distance as possible from the indoor equipment to where the taps for the bypass duct are made to the supply and return plenums; this allows better mixing of the air, and less concern for tripping temperature limits. Sizing of the bypass duct should be selected so that a maximum of 25% system airflow is allowed to bypass into the return duct. Excessive bypass airflow can cause equipment short cycling and reduce equipment life.
  4. Install the Master Observer wall control, Color Touch Screen (CTS) smart zone sensors, and/or Zone Room Sensors in areas with ambient temperatures between 32° to 104° F (0° to 40°C), with non-condensing humidity. Install dampers and the Observer Zoning Panel in areas with ambient temperatures between -4° to 158° F (-20° to 70° C), and non-condensing humidity.

## INSTALLATION

### STEP 1—CHECK EQUIPMENT AND JOB SITE

**INSPECT EQUIPMENT** — File claim with shipping company, prior to installation, if shipment is damaged or incomplete.

### STEP 2—COMPONENT LOCATION AND WIRING CONSIDERATIONS

## WARNING

### ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing or servicing system, always turn off main power to system and install lockout tag. There may be more than one disconnect switch.

Disconnect supply power before routing wire.

**NOTE:** All wiring must comply with national, local, and state codes.

## Locating Observer Zoning Panel

**NOTE:** All wiring is run back to the Observer Zoning Panel.

Select a location near the Observer furnace or fan coil where wiring from the Master Observer wall control, each Zone Remote Room Sensor (this remote room sensor is used to sense the temperature in a Zone, and is different from the similar part number remote room temperature sensor used with the Observer wall control) or CTS (Color Touch Screen) Zone Sensor, each damper actuator, and the equipment itself can come together easily.

The Observer Zoning Panel is approved for indoor use only and should never be installed with any of its components exposed to the elements. The Observer Zoning Panel (and the zone dampers) may be installed in any area where the temperature remains between -4° F. to 158° F. (-20° C to 70° C), and where there is no condensation. The cover must be installed to prevent damage from other sources. Do not locate where it will be accessible to children.

It may be mounted in either vertical or horizontal position. Remember that wiring access is likely the most important consideration.

## CAUTION

### ELECTRICAL OPERATION HAZARD

Failure to follow this caution may result in damage to the unit or improper operation.

To prevent possible damage to the Observer Zoning Panel, do not mount on plenum, duct work, or flush against furnace.

## LOCATING Observer Wall Control

The Master Observer Wall Control is the command center for the Observer Zone System. The Master wall control should be located where it is easily accessible and visible to the home or business owner. It is the Zone 1 sensor and as such needs to be located to properly measure the temperature in Zone 1.

If the Master Observer wall control cannot be installed in the zone 1 space, a separate Remote Room Sensor (this RRS is different for the RRS used for zones other than Zone 1, even though the part number is similar) can be added for Zone 1 by connecting it to the S1 and S2 terminals on the Master Observer wall control back plate.

**NOTE:** The Master Observer Wall Control also controls humidity functions. If the User Interface is not used to control Zone 1 temperature (that is, a remote room sensor is attached to the Master Observer® wall control to sense temperature), it must still be located in a suitable area where humidity control will not be affected.

## LOCATING SENSORS

For proper operation, each sensor must accurately measure the temperature within its zone. For accurate temperature measurement, the following guidelines should be followed:

### Sensor should be mounted:

- Approximately 5 ft. (1.5m) from floor.
- Close to the center of its zone, preferably on an inside wall.

- On a section of wall without pipes or ductwork.

### Sensor should NOT be mounted:

- Close to a window, on an outside wall, or next to a door leading to the outside.
- Where it will be exposed to direct light and heat from a lamp, sun, fireplace, or other temperature radiating object which may cause a false reading.
- Close to or in direct airflow from supply registers.
- In areas with poor air circulation, such as behind a door or in an alcove.

## WIRING CONSIDERATIONS

Ordinary thermostat wire is ideal when wiring the Observer Zoning System (shielded cable is not typically necessary). It is recommended to use 18 AWG thermostat wire to install the Observer Zoning system. For retrofit applications, 18–22 AWG may be acceptable. Wiring lengths should not exceed 100 feet. 22 AWG wire lengths should be limited to runs of 25 feet or less. A CTS Zone Sensor may replace the Zone Remote Room Sensor with no wiring changes at a later date. The Observer Wall Control requires 4 conductors, each damper actuator requires either 2 or 3 conductors. Cut off or fold back and tape any unneeded wires. Plan the routing of wiring early to avoid possible problems later. Sometimes, it is a good idea to run conduit in hard to access locations, in case a new wire must be pulled at a later date. Remember, all wires converge at the Observer Zoning Panel, so its location is important.

**NOTE:** Wiring of the Observer communication bus only requires a four wire connection; however, it is good practice to run thermostat cable having more than four wires in the event of a damaged or broken wire during installation.

The following color code is recommended for each Observer connection bus connection:

- DX+ — Green = Data +
- DX- — Yellow = Data -
- C — White = 24 VAC (Com)
- R — Red = 24VAC (Hot)

It is not mandatory that the above color code be used, but each bus connection in the system **MUST** be wired consistently.

## STEP 3—INSTALL COMPONENTS

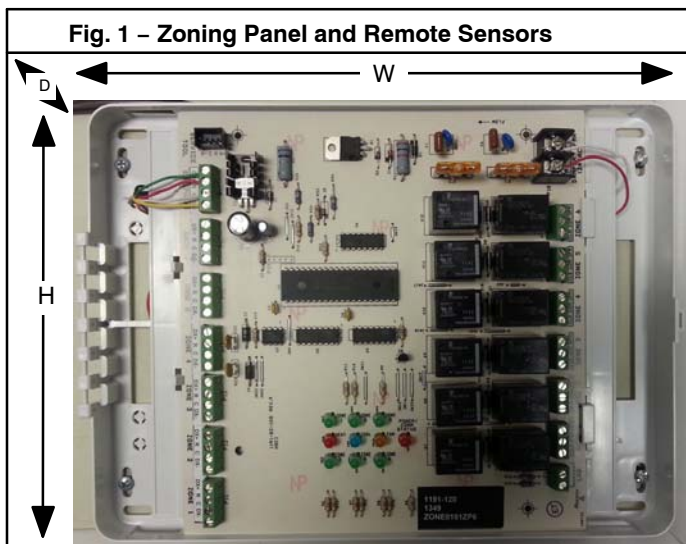
### INSTALL Observer Zoning Panel

The Observer Zoning Panel is designed so that wires can enter it from behind, above, or below. Plan wire routing before mounting the Zoning Panel.

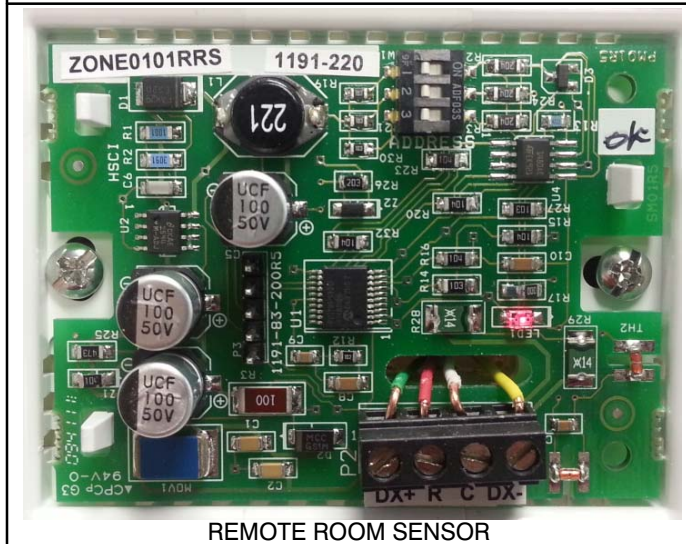
1. Open cover to access mounting holes.
2. Mount back plate to wall using screws and wall anchors provided.
3. Level back plate and tighten screws.

**INSTALL Observer Wall Control** — (see Observer Wall Control Installation Instructions for details).

**NOTE:** Improper wiring of the green communication bus connector will cause the Observer Zoning System to operate improperly and/or fail to communicate. Check to make sure all wiring is correct before proceeding with installation or turning on power.



ZONING PANEL



REMOTE ROOM SENSOR

**DIMENSIONS - in.(mm)**

Height	Width	Depth
7.75 (197)	10.35 (263)	2 (51)

**INSTALL Remote Room Sensors**

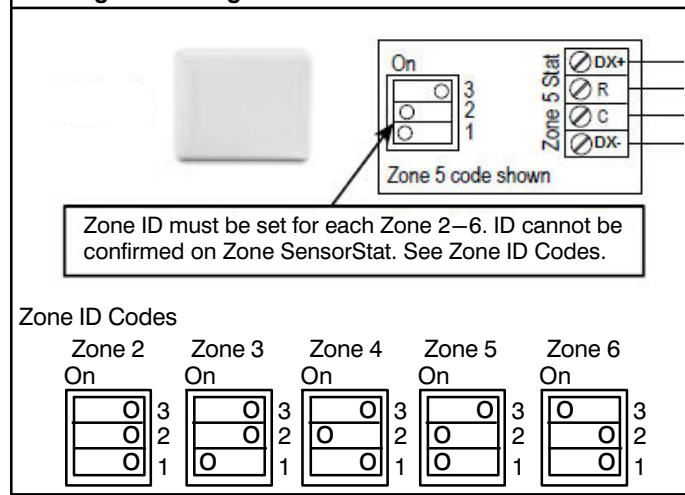
1. Separate the sensor cover and mounting back plate by squeezing the top and bottom of the cover together firmly by grasping the raised top and bottom ridges. This will release the cover. Mount to wall using provided screws and anchors.
2. Pull a 4-conductor wire through hole on right-hand side.
3. Recommended connection is:

- DX+ — Green = Data +
- DX- — Yellow = Data -
- C — White = 24 VAC (Com)
- R — Red = 24VAC (Hot)

4. Push any extra wire into wall and seal hole to prevent air leaks. Align sensor cover with base plate then press firmly until cover snaps into place.

The Master Observer Wall Control and Zone Sensors should be wired to the appropriate terminal connectors on the Observer Zoning Panel. If the low-voltage wiring must be run alongside line voltage wiring or near fluorescent lighting or other electrically noisy devices, shielded cable should be used and grounded at the common terminal on one end). The dip switch on each OBSERVER Zone Sensor should be selected for the appropriate zone number; for instance, Zone 2 sensor should be selected using the DIP switch for 'off, off, off'.

**Fig. 2 - Zoning Remote Sensors**

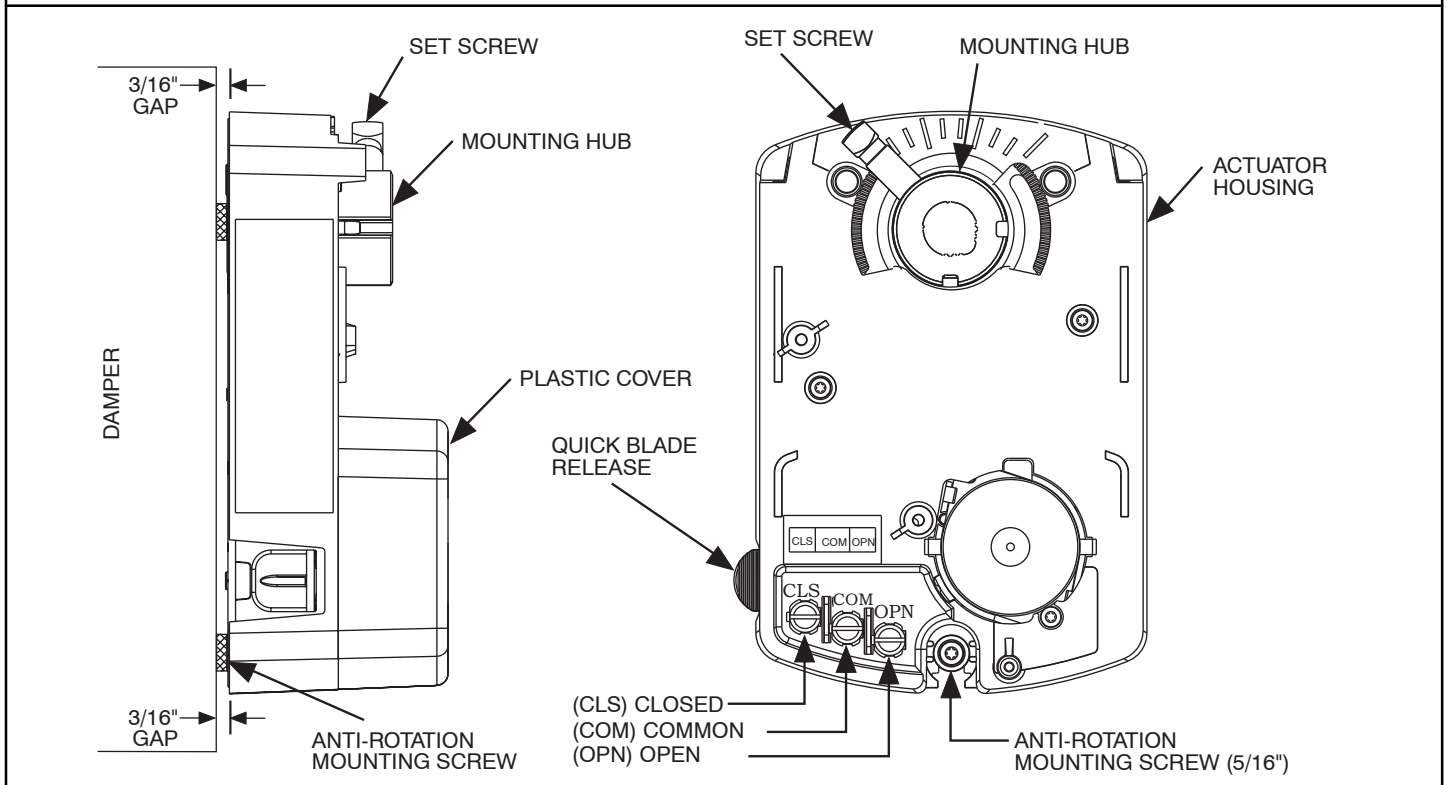


**STEP 4—INSTALL ZONE DAMPERS**

**NOTE:** Proper selection and sizing of dampers is very important for proper system operation. Be sure to consult the Damper Product Data Digest, and the Observer® Communicating Control specification sheet zoning section, for assistance in making these selections. Selection and sizing information is not provided in this installation instruction.

Zone dampers are available in round and rectangular and may be installed in any position. Install dampers so that actuator is visible for inspection and accessible in the event it would need to be serviced. The black mark on the end of the damper shaft represents position of damper blade. To wire damper, locate terminals labeled: OPN (open); COM (common); CLS (closed); and wire appropriately (see Fig. 1 for Damper 24 VAC connection).

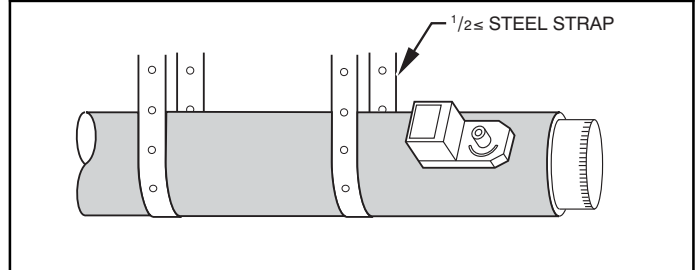
**Fig. 3 - Damper 24 VAC Connections**



If duct system requires multiple dampers for a single zone, up to 3 dampers (maximum) may be wired in parallel. For all applications, including retrofit, it is recommended to use only current dampers with direct-drive style actuators. **DO NOT** use older damper with crank-arm style actuators.

If an actuator is removed from a damper for any reason, it must be properly aligned when it is reinstalled. This can be done by rotating the actuator and the blade to their closed positions and then tightening the actuator (set screw) to the shaft. This assures alignment at the closed position. (Pressing the quick blade release button allows the actuator to be manually turned).

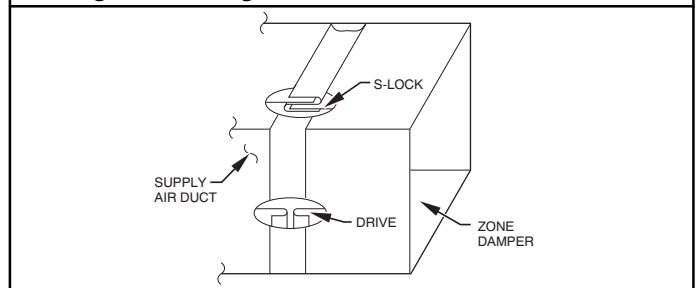
**Fig. 4 - Insulated Round Metal Ductwork**



**RECTANGULAR DUCTWORK**

1. Make connections using S-lock and drives (See Fig.5).
2. Properly seal joint using duct tape, mastic, or other approved method. Do not allow mastic to come in contact with actuator.
3. If dampers are applied in an unconditioned space, insulate damper using 1-1/2 inch to 2 inch insulation (See Fig. 6).

**Fig. 5 - Rectangular Ductwork**



**⚠ CAUTION**  
**ELECTRICAL OPERATION HAZARD**  
 Failure to follow this caution may result in damage to the unit or improper operation.  
 Condensation can damage the actuator. When dampers are located in an unconditioned space, condensation is likely to occur in cooling. To prevent condensation and losses, all dampers and ductwork in unconditioned space must be insulated or otherwise protected.

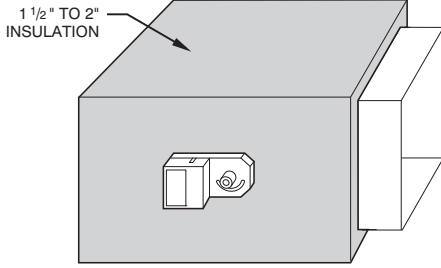
For specific duct types, follow instructions below:

**NOTE:** All zone dampers and ductwork must be properly supported according to local codes or SMACNA standards.

**ROUND METAL DUCTWORK**

1. Crimp end of branch duct.
2. Slip end of zone damper over end of ductwork. Use selftapping sheet metal screw to secure.
3. Properly seal joint using duct tape, mastic, or other approved method. Do not allow mastic to come in contact with actuator.
4. If dampers are applied in an unconditioned space, insulate damper using 1-1/2 inch to 2 inch insulation (See Fig. 4).

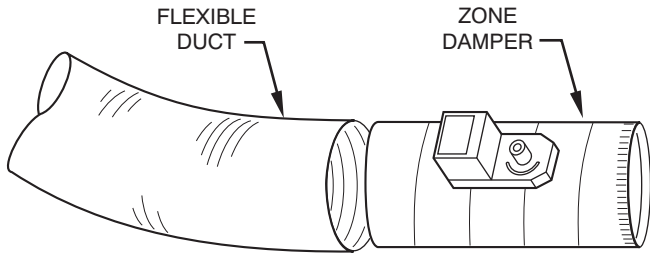
**Fig. 6 – Insulate Damper**



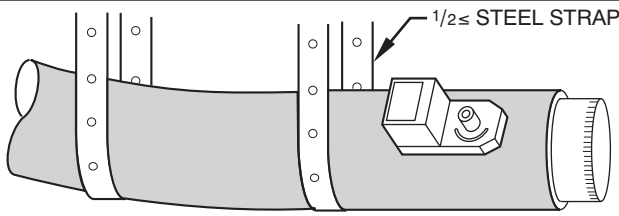
**ROUND FLEXIBLE DUCTWORK**

1. Slip one end of flexible ductwork over end of zone damper (See Fig. 7).
2. Secure flexible duct to zone damper using SMACNA or other approved method.
3. Properly seal joint using duct tape, mastic, or other approved method. Do not allow mastic to come in contact with actuator.
4. If dampers are applied in an unconditioned space, insulate damper using 1-1/2 inch to 2 inch insulation (See Fig. 8).

**Fig. 7 – Round Flexible Ductwork**



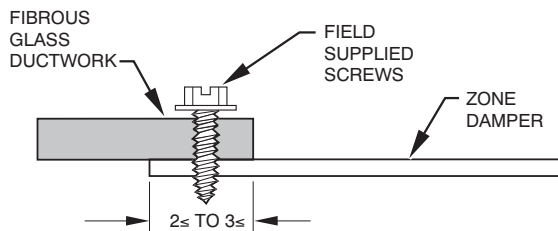
**Fig. 8 – Insulate Ductwork**



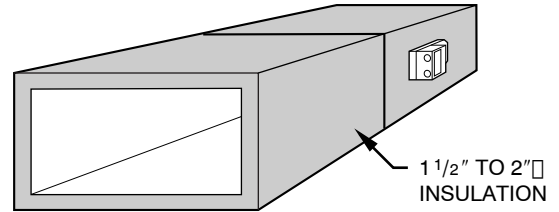
**RECTANGULAR FIBROUS GLASS DUCTWORK**

1. Insert one end of zone damper into end of fibrous glass ductwork approximately 2 to 3 inches (See Fig. 9).
2. Use field supplied screws to secure duct board to zone damper.
3. Properly seal joint using duct tape, mastic, or other approved method. Do not allow mastic to come in contact with actuator.
4. If dampers are applied in an unconditioned space, insulate damper using 1-1/2 inch to 2 inch insulation (See Fig.10).

**Fig. 9 – Rectangular Fibrous Glass Ductwork**



**Fig. 10 – Insulated Rectangular Fibrous Glass Ductwork**



**STEP 5—FINAL WIRING**

Bring all damper and sensor wires together at the Observer® Zoning Panel. Make all system wiring connections as indicated in Fig. 11.

The two DX, +DX, -R, C Observer communication bus connections on the Observer Zoning Panel are in parallel with each other. Use either terminal block to connect the Master Observer wall control, Zone Room Remote Sensor(s), Observer communicating variable-speed indoor unit and communicating outdoor unit (if applied).

**LEAVING AIR TEMPERATURE SENSOR**

**IMPORTANT NOTE:** The ZONEXX0DTS01 is required for proper zone board operation.

The LAS input on the Observer® Zoning Panel is used to protect the equipment from very high or very low leaving air temperatures. The equipment will be cycled off if the temperature is less than 45°F or more than 180°F. The equipment will cycle back on when the temperature is above 45° F and below 180°F and after 15 minutes have passed. The heating and cooling LAS limits are adjustable. See the Observer control installation instructions for more information.

**LED INDICATORS**

Under normal operation, the Yellow and Green LEDs will be on continuously (solid). If the Observer Damper Control does not receive communications with the User Interface, the Green LED will not be on. If a zone damper has been modulated to a position that is not fully open or fully closed, that zone's LED will flash slowly, to indicate a partially open damper. If there are faults present, the Yellow LED indicator will blink a single-digit status code. It will blink at a fast rate, pause, then repeat.

**FUSES**

A 5-amp automotive type fuse is used to protect the Observer Zoning Panel from over current on the damper drive outputs. If this fuse fails, damper wiring should be inspected for shorts. Also, no more than five damper motors should be connected to a single damper output. Fuse should always be replaced with an identical 5 amp automotive fuse.

**STEP 7—Transformer Requirements**

The Observer Zoning System requires a field supplied 75VA (maximum) transformer to power the dampers. Use of the transformer provided in the furnace or fan coil is NOT recommended. Refer to Fig. 13 & 14 for transformer usage. Alternate Zone Panel transformer recommended @ 60VA 24V field supplied.

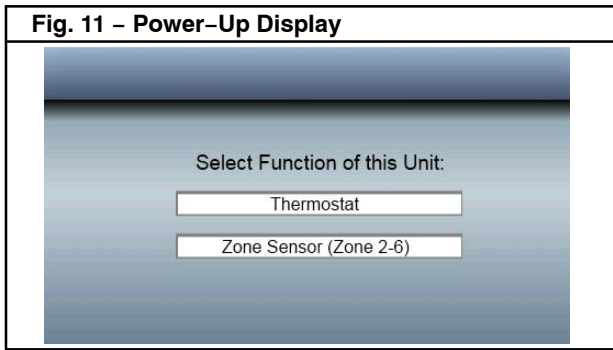
**STEP 8—System Start-Up**

Refer to Fig. 13 and Fig. 14 For transformer usage. Alternate Zone Panel transformer recommended @ 60VA 24V field supplied.

Follow the system start-up process outlined in the Observer Communicating Zone Control Installation Instructions for details.



On initial power up, the Observer Wall Control will display the following screen.

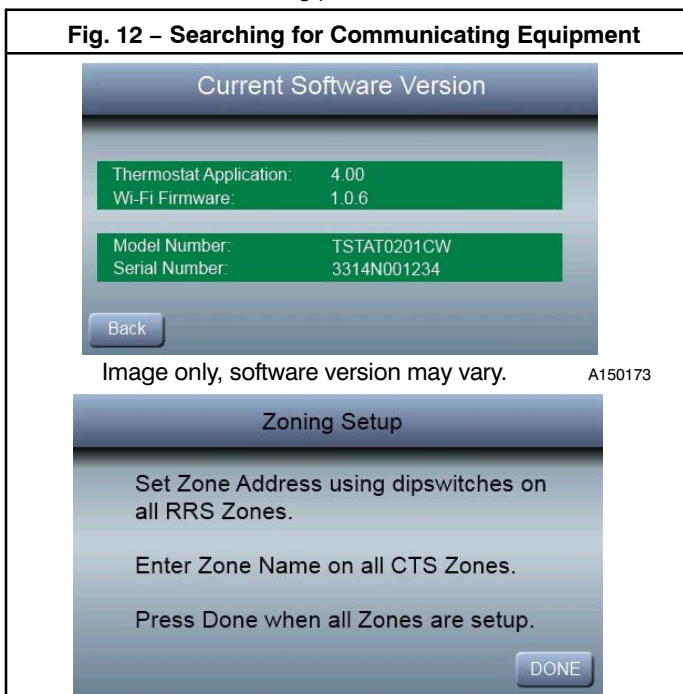


Select the proper option for the Master Observer Wall Control. The Master control should be selected as Thermostat. If the Observer wall control is to be used as a zone sensor, select the second option, Zone Sensor.

If the Observer Wall Control is already installed in an application, the zoning panel, sensors, and dampers may be added at a later date. The Observer Wall Control must have software version 3.0 or later installed for it to communicate with the zoning panel and sensors.

**NOTE:** If the number of zones selected is less than 6, the remaining zones will be disabled.

After selecting Thermostat on the Observer Wall Control, it will search for communicating indoor equipment. If a communicating unit is found, it will proceed to search for a communicating outdoor unit, then the zoning panel and remote sensors.



## DAMPER

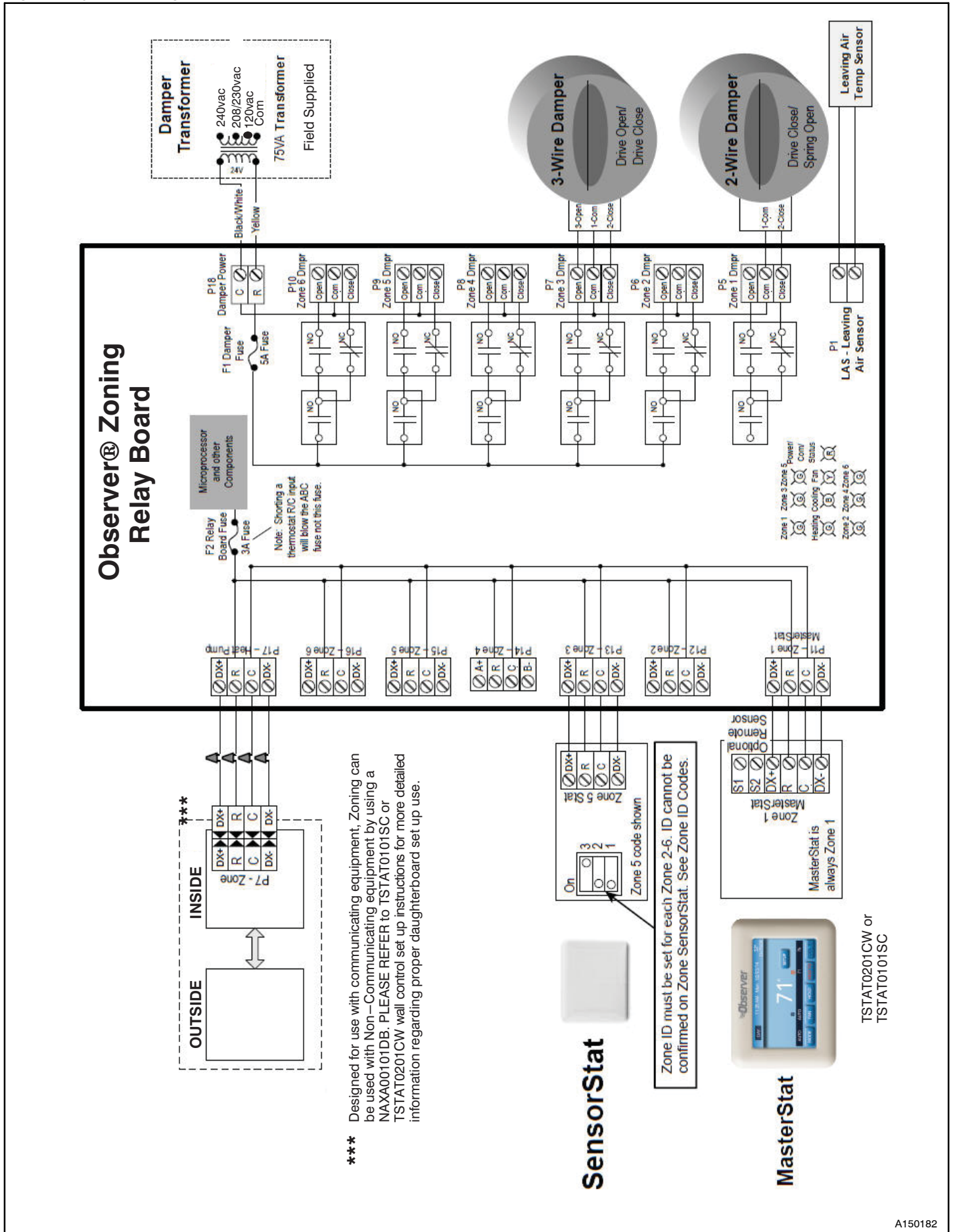
**IMPORTANT!** If using other manufacturers' dampers, verify damper opening/closing time requirements. Possible system high temperature limit trips if not set according to specifications on the motor drive requirements.

In addition, a second 60VA 24V field supplied communication bus transformer is recommended if CTS zone sensors are used. Refer to Fig. 13 and Fig. 14 for transformer usage.

The Damper screen allows the selection of either wire (spring open/spring closed) or 3 wire (power open/power closed) type. If a power open/spring closed-type damper is to be used, connect the damper wires to the Open and Common terminals on the Observer Zoning Panel. If a power closed/spring open-type damper is to be used, connect the damper wires to the Close and Common terminals on the Observer Zoning Panel.

**NOTE:** See the Observer Communicating Control specification sheet for information on damper characteristics required for compatibility with the Observer zoning system.

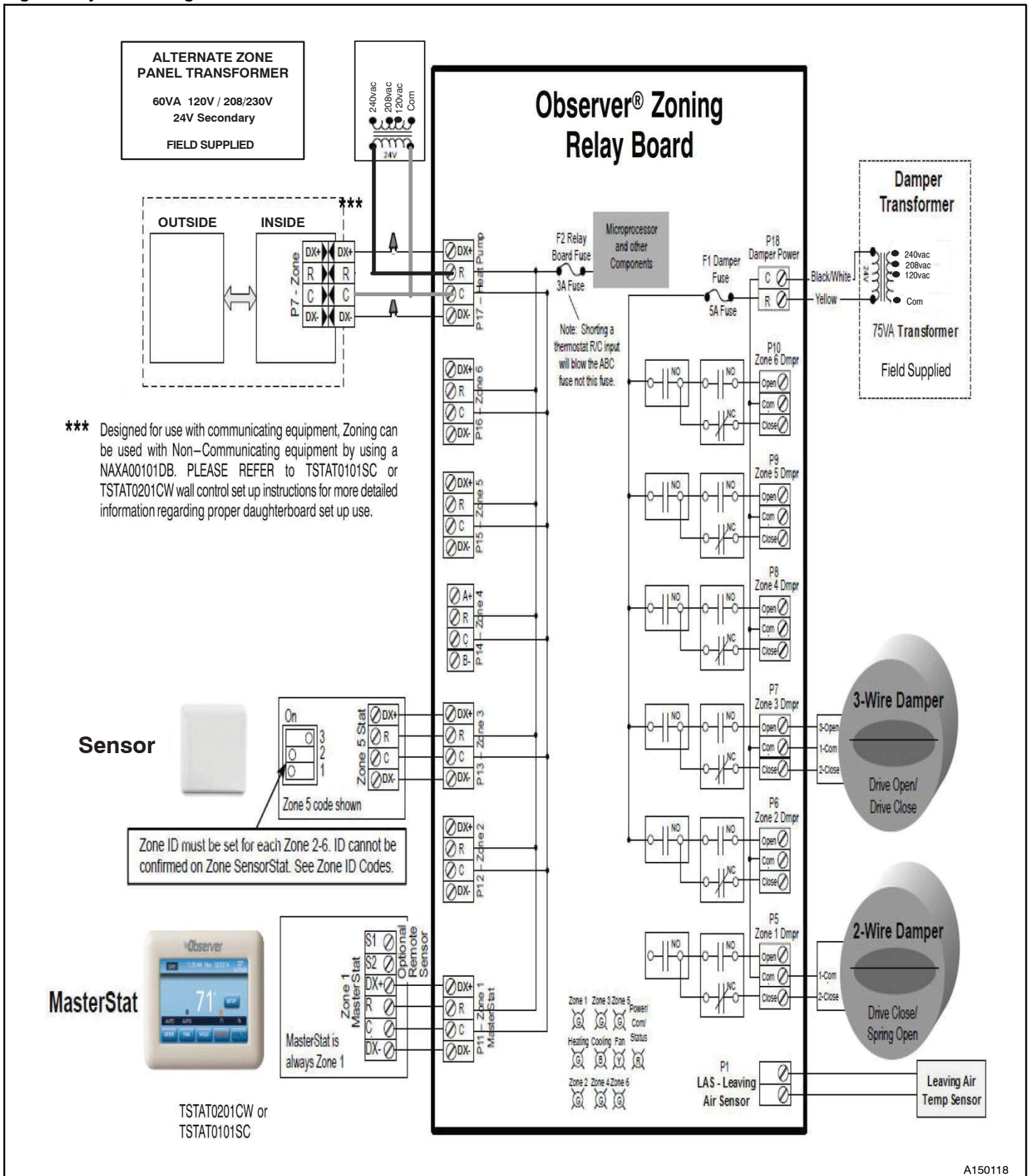
Fig. 13 – System Wiring



\*\*\* Designed for use with communicating equipment; Zoning can be used with Non-Communicating equipment by using a NAXA00101DB. PLEASE REFER to TSTAT0101SC or TSTAT0201CW wall control set up instructions for more detailed information regarding proper daughterboard set up use.



Fig. 14 – System Wiring



A150118