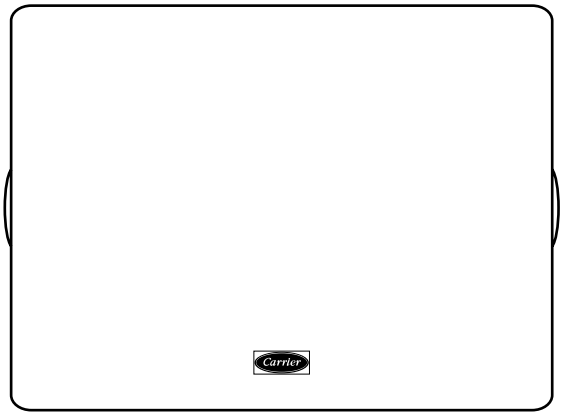
Carrier
HEATING & COOLING

SYSTXCC4ZC01
Infinity Damper Control

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Installation and Start-Up Instructions



Infinity Damper Control
SYSTXCC4ZC01

A97040

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

This symbol → indicates a change since the last issue.

TABLE OF CONTENTS

SAFETY CONSIDERATIONS 1
INSTALLATION CONSIDERATIONS 1
INTRODUCTION 1
INSTALLATION 2
- Check Equipment and Job Site 2
- Component Location and Wiring Considerations 2
- Install Components 3
- Install Zone Dampers 3
- Final Wiring 4
- Additional Damper Control Board Setup 5
- Optional Transformer Requirements 5
- System Startup 5

TROUBLESHOOTING 7

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause fire, electrical shock, or other conditions that may cause 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 and wear safety glasses. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local and state building codes and Sheet Metal and Air Conditioning National Association (SMACNA) for special installation requirements.

This is the safety-alert symbol ⚠ . When you see this symbol on the equipment and in the instruction manual, be alert to the potential for personal injury. Understand the 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 a hazard, which **could** result in personal injury or death. **CAUTION** is used to identify unsafe practices, which **would** 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

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

This instruction covers the physical installation and start up of the Infinity Damper Control. Use this instruction to guide the actual installation process after all the air side decisions have been made. One Damper Control is capable of handling up to four zones of operation. When greater than four zones are required, a second Damper Control Module is needed for zones 5 through 8 (8 zones maximum).

1. Install the Infinity Zone Control (User Interface) and Remote Room Sensors in non-condensing areas with ambient temperatures between 32° F. and 120° F. Install Dampers and Infinity Damper Control in non-condensing areas with ambient temperatures between -4° F. to 158° F., (-20° to 70° C).
2. A TXV is required on the indoor coil when used with all residential split system equipment.
3. Proper equipment selection and duct sizing are important in a zoned system.
4. **DO NOT USE** a bypass damper with the Infinity Zoning System. Addition of a bypass will cause improper operation. Airflow management will be performed by the User Interface algorithms. The User Interface will monitor the system and will maintain proper airflow through the heating / cooling equipment.

INTRODUCTION

The Infinity Zoning System allows air conditioning and heating equipment to control temperatures and humidity in up to 8 distinct spaces, or zones, within a building. Each zone has independent temperature settings. The comfort temperature settings can change automatically through the use of schedules. This allows the Infinity System to change temperature settings in zones to reflect occupancy or usage. For example, the end user can condition bedrooms in a home from 5:00 PM through 7:00 AM or the kitchen from 3:00 PM through 6:00 PM. The Infinity System uses motorized air volume control dampers (also called zone dampers) to regulate flow of conditioned air into zones. In this manner, the system can selectively heat or cool certain portions of a building depending upon space temperature requirements.

Each zone requires a motorized zone damper to control the air supplied to it and a zone sensor to sense temperature in each zone. There are three types of zone sensors available and may be used in combination:

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Book 1 4 Tab misc. misc. PC 101 Catalog No. 809-50012 Printed in U.S.A. Form DAMP4ZC-1SI Pg 1 04-04 Replaces: NEW

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- Zoning User Interface (p/n SYSTXCCUIZ01) — Each installation has only 1 User Interface. This is the command center for the entire system. It will typically be located in Zone 1 to sense and control the temperature in this zone. If desired, a Remote Room Sensor or a Smart Sensor may be used to sense the Zone 1 temperature. This can give the installer some flexibility in locating the User Interface to another area.
- Remote Room Sensor (p/n SYSTXCCRRS01) — Any zone may use a Remote Room Sensor (including Zone 1). This is a temperature sensor only, having no additional user inputs. In applications where zone temperature averaging may be desired, this may be done using 4 Remote Room Sensors in a series / parallel wiring configuration (See Fig. 11 for Remote Room Sensor Averaging).
- Smart Sensor (p/n SYSTXCCSMS01) — Any zone may use a Smart Sensor (including Zone 1). It provides a temperature display and buttons to adjust the desired temperature in that zone only. It also displays the outdoor temperature and indoor humidity.

Be sure to select the desired sensor type for each zone. Zone sensors other than the User Interface must be purchased separately. Installation Instructions for these sensors are included with them.

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 possible equipment damage.
Disconnect supply power before routing wire.

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

LOCATING INFINITY DAMPER CONTROL — All system wiring is run back to the Infinity Damper Control. Select a location near the Infinity furnace or fan coil where wiring from the User Interface, each Remote Room Sensor or Smart Sensor, each damper actuator, and the equipment itself can come together easily.

The Infinity Damper Control is approved for indoor use only and should never be installed with any of its components exposed to the elements. The Infinity Damper Control (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 will result in equipment damage or improper operation.
To prevent possible damage to the Infinity Damper Control, do not mount on plenum, duct work, or flush against furnace.

LOCATING ZONING USER INTERFACE — The User Interface is the command center for the Infinity Zone System. It should be located where it is easily accessible and visible to home or business owner. It is also normally the Zone 1 sensor and as such needs to be located to properly measure the temperature in Zone 1. If these two requirements conflict, a separate Remote Room Sensor can be added for Zone 1.

When a Remote Room Sensor is connected to Zone 1 terminals(ZS1 and ZS1C) of the Infinity Damper Control, the system automatically switches to using this sensor for Zone 1 and ignores the sensor within the User Interface. This arrangement allows the User Interface to be located at any convenient place within the home or business. In this arrangement, only the Zone 1 Remote Room Sensor must be located in Zone 1.

NOTE: The User Interface also controls humidity functions. If the User Interface is not used to control Zone 1 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 Infinity Zoning System (shielded cable is not necessary). Use 22 AWG or larger for typical installations. Lengths over 100 ft. should use 20 AWG or larger wire. Remote Room Sensors require only 2 conductors, but it is recommended that at least 4 conductors be run. This will allow a Smart Sensor to replace the Remote Room Sensor with no wiring changes at a later date. The User Interface requires 4 conductors, each damper actuator requires 3 conductors. Cut off or fold back and tape any unneeded wires. Plan the routing of wiring early to avoid possible problems later. Remember, all wires converge at the Infinity Damper Control, so its location is important.

NOTE: Wiring of the ABCD 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 ABCD bus connection:

A — Green = Data A
B — Yellow = Data B
C — White = 24 VAC (Com)
D — 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.

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Step 3— Install Components

INSTALL INFINITY DAMPER CONTROL — The Infinity Damper Control is designed so that wires can enter it from behind, above, or below. Plan wire routing before mounting Damper Control.

1. Remove 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 ZONING USER INTERFACE — (see Infinity Zone Control Installation Instructions for details).

NOTE: Improper wiring of the ABCD connector will cause the Infinity Zoning System to operate improperly. Check to make sure all wiring is correct before proceeding with installation or turning on power.

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 2-conductor wire through hole on right-hand side.
3. Recommended connection is BLACK to either terminal, WHITE to remaining terminal (sensor terminals are not marked for polarity because polarity is not important). Stranded or common bell wire may be used. Lengths up to 1000 ft. will contribute no noticeable error.
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.

INSTALL ZONING SMART SENSOR — See Infinity Zoning Smart Sensor Installation Instructions for details.

Step 4— INSTALL ZONE DAMPERS

Proper selection and sizing of dampers is very important for proper system operation. Be sure to consult the Damper Product Data Digest for assistance in making these selections. Selection and sizing information is not provided in this installation instruction.

Zone dampers are available in round, rectangular, and slip-in design 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).

If duct system requires multiple dampers for a single zone, up to 5 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).

⚠ CAUTION

ELECTRICAL OPERATION HAZARD

Failure to follow this caution will result in euipment damage 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.

Whenever condensation might occur, it is recommended that a plastic actuator cover (p/n, DAMPACTXXCOV) be used over the actuator. These covers can help prevent condensation on actuators by locking out ambient humidity. Insulation may be applied over the cover to minimize heat transfer.

To install, place the cover over actuator and seal in place over the surrounding insulation with duct tape on all four sides. Sealing need not be perfect because there will be positive pressure inside the cover. Do not mount the dampers with their actuators hanging directly beneath the ductwork. It is best to mount the actuator facing in either the three or nine o'clock position.

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 self-tapping 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. 2).

RECTANGULAR DUCTWORK

1. Make connections using S-lock and drives (See Fig. 3).
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. 4).

ROUND FLEXIBLE DUCTWORK

1. Slip one end of flexible ductwork over end of zone damper (See Fig. 5).
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. 6).

RECTANGULAR FIBROUS GLASS DUCTWORK

1. Insert one end of zone damper into end of fibrous glass ductwork approximately 2 to 3 inches (See Fig. 7).
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. 8).

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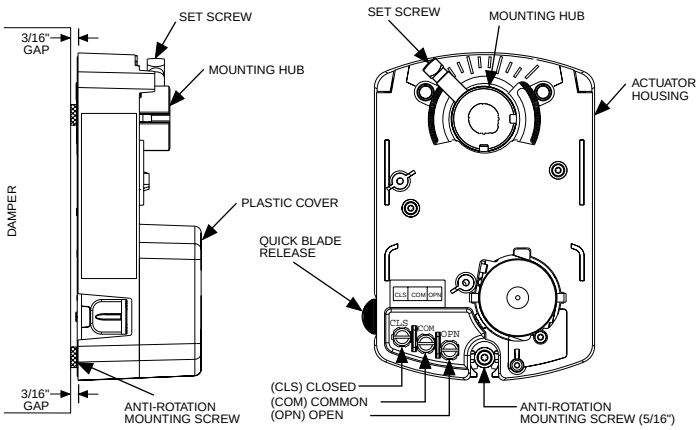


Fig. 1 — Damper 24-vac Connections

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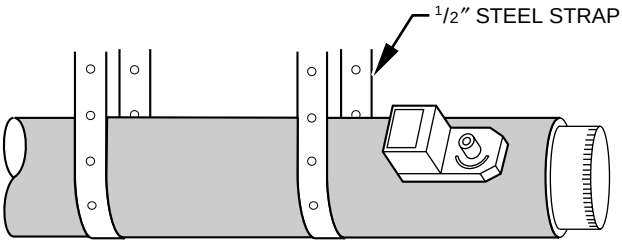


Fig. 2 — Insulated Round Metal Duct Work

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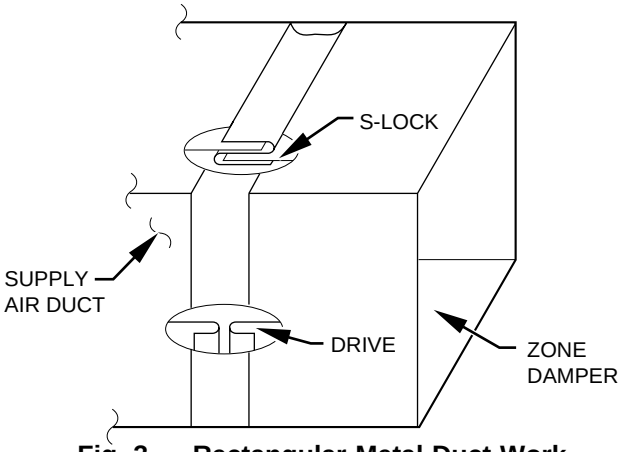


Fig. 3 — Rectangular Metal Duct Work

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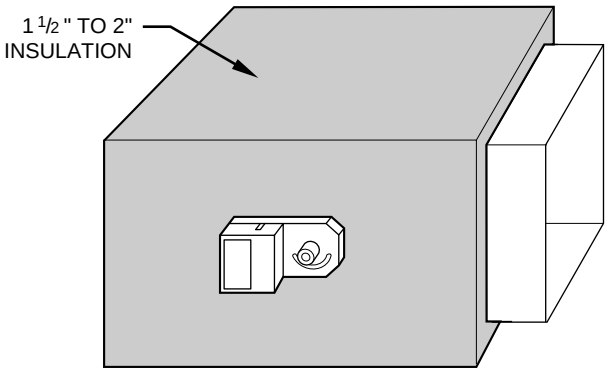


Fig. 4 — Insulated Rectangular Metal Duct Work

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Step 5—FINAL WIRING

Bring all damper and sensor wires together at the Infinity Damper Control. Make all system wiring connections as indicated in Fig. 9. The two ABCD bus connections on the Infinity Damper Control

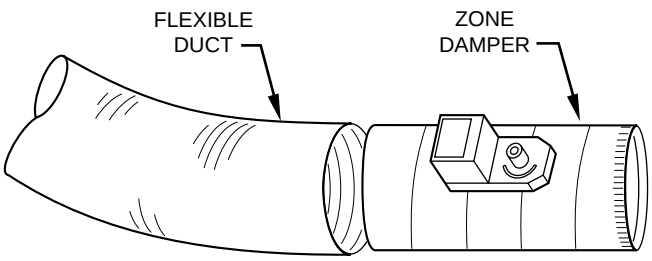


Fig. 5 — Round Flexible Duct Work

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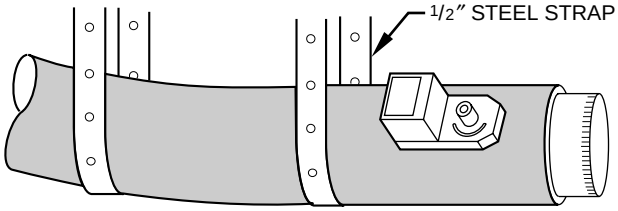


Fig. 6 — Insulated Round Flexible Duct Work

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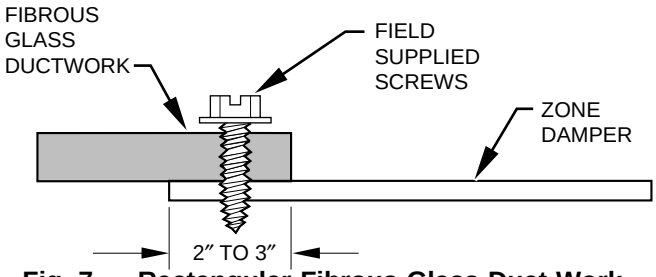


Fig. 7 — Rectangular Fibrous Glass Duct Work

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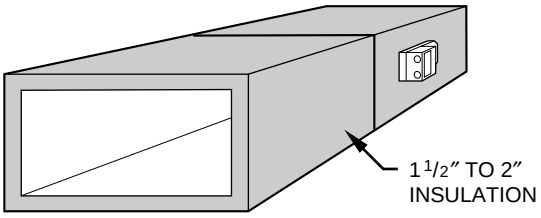


Fig. 8 — Insulated Rectangular Fibrous Glass Duct Work

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are in parallel with each other. Use either terminal block to connect the Zoning User Interface, Smart Sensor(s), variable-speed indoor unit and 2-speed communicating outdoor unit (if applied). If more than four zones are required (up to 8 zones maximum), see Step—6 and Fig. 10 for Additional Damper Control Board Setup for Zones 5-8.

VENTILATOR WIRING — The Infinity Damper Control can control a Carrier Heat Recovery Ventilator or Energy Recovery Ventilator (HRV / ERV). Connect the four wires from the ventilator control board (see ventilator installation instructions for details) to the connector labeled (YRGB). This label identifies the color of the wire to match the ventilator wire colors (Y=yellow, R=red, G=green, B=blue or black). If you have two Infinity Damper Controls, connect the ventilator to the control for zones 1 through 4.

LEAVING AIR TEMPERATURE / HEAT PUMP TEMPERATURE (LAT/HPT) SENSORS — These inputs on the Infinity Damper Control are used only for diagnostic purposes and

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NOT required for regular use. Traditionally, the LAT/HPT sensors were required for temperature / equipment monitoring. The Infinity Zoning System does not require these because the User Interface algorithms will perform temperature and airflow management without use of these sensors. If desired, one or both sensors may be used in monitoring leaving air temperature and / or indoor coil air temperature. Consideration and / or flexibility will now permit using one of these sensors in the return air duct giving the dealer an option to view both entering and leaving air temperature at the User Interface. If applied, connect sensors to the LAT / HPT terminals (See Fig. 9, System Wiring, for connection to Infinity Damper Control). LAT is monitored by both AC and HP systems. LAT and HPT are both monitored **only** in HP systems.

To install - Locate LAT sensor in main supply trunk after heating and cooling coil and before first branch. The LAT sensor is radiant shielded to prevent heat from affecting correct air temperature.

1. Drill a 1/4 inch hole at location in supply trunk where sensor will be installed.
2. Insert sensor in hole and use as a template to mark the 2 mounting holes.
3. Drill two 1/16 inch holes to accept No. 6 screws through pre-drilled holes in duct temperature sensor back plate.
4. Use two No. 6 sheet metal screws to mount duct temperature sensor to unit.
5. Connect sensor to 2-conductor wire using provided wire nuts.

The HPT sensor (in heat pump applications) measures the temperature of the air leaving the indoor coil. The sensor is installed downstream of the indoor coil but before the electric heaters. It can be installed through the wall of the fan coil or may be located entirely inside the fan coil near the blower inlet. Anchor firmly in place with cable ties so that it cannot interfere with the blower wheel (See Fig. 9).

LED INDICATORS — Under normal operation, the Yellow and Green LEDs will be on continuously (solid). If the Infinity Damper Control does not receive communications with the User Interface, the Green LED will not be on. If there are faults present, the Yellow LED indicator will blink a two-digit status code. The first digit will blink at a fast rate, the second at a slow rate.

STATUS CODE	DESCRIPTION
16 =	Communication Failure
24 =	Damper Fuse Failed
45 =	Board Failure
46 =	Low Input Voltage

FUSE — A 1-amp automotive type fuse is used to protect the Infinity Damper Control 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 3 amp automotive fuse.

Step 6—ADDITIONAL DAMPER CONTROL BOARD SETUP

If you have more than four zones, a second Infinity Damper Control must be used and both dip switch settings on the second board supporting zones 5 through 8 must be moved to the right. The ABCD bus connector must be wired between both Infinity Damper Controls.

Step 7—Transformer Requirements

The Infinity Zoning System has a lower power draw from the system transformer than previous controls. It also drives only 2 zone damper outputs at a time. As a result, up to 8 zones each with up to 5 dampers, plus a smart sensor, can be handled without increasing the size of the system transformer or adding a second zoning transformer.

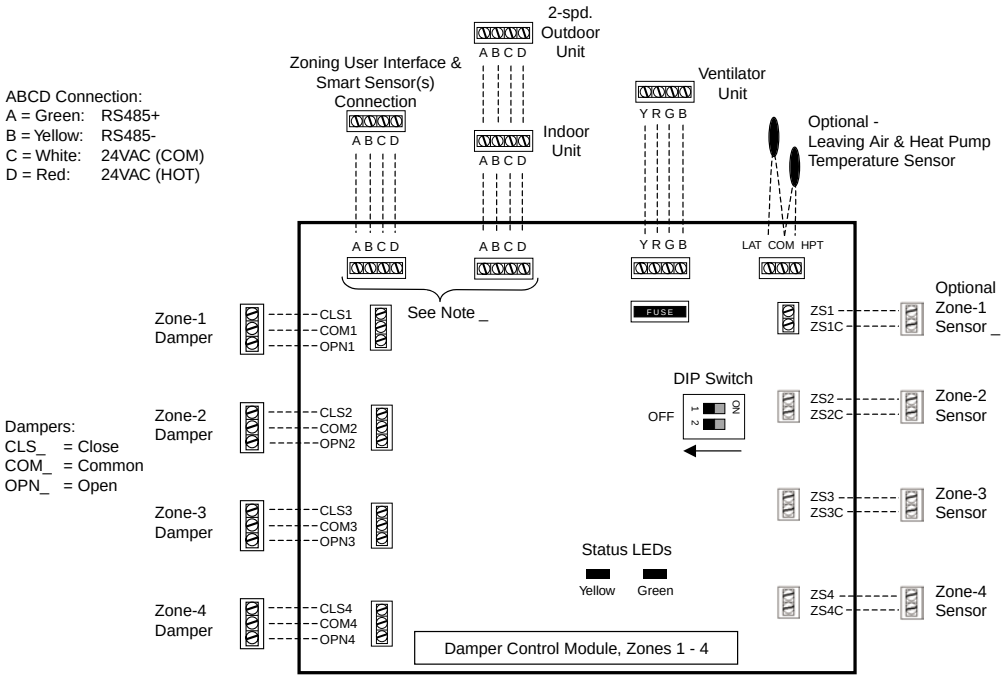
Use of the transformer provided in the furnace or fan coil is recommended without change in all zoning applications except those having a System Access Module (SAM). The SAM requires a separate transformer.

For those who still want more transformer capacity, a 60 VA system transformer may be used in place of the supplied 40 VA part.

Step 8—System Start-Up

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

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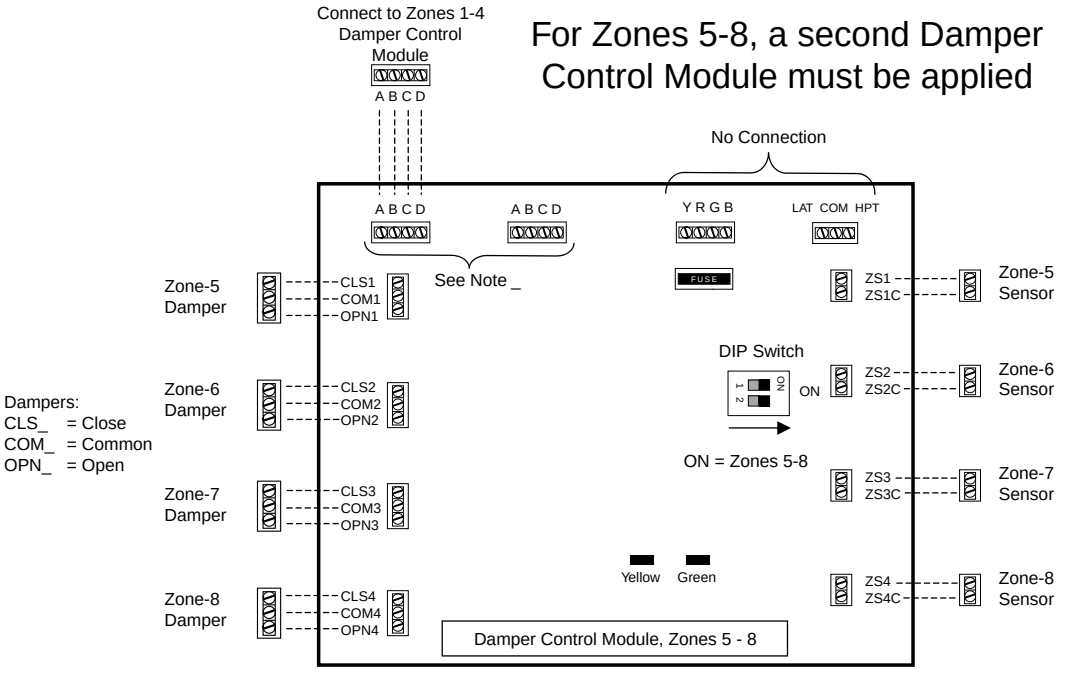
Notes:
_ ABCD CONNECTORS ARE IN PARALLEL WITH EACH OTHER. USE EITHER TERMINAL BLOCK FOR ANY ABCD CONNECTION.

_ INSTALLING ZONE-1 REMOTE ROOM SENSOR WILL OVERRIDE USER INTERFACE TEMPERATURE SENSOR.

Zoning System Wiring Diagram Zones 1 - 4

Fig. 9 — System Wiring

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Notes:
_ FOR ZONES 5 THROUGH 8: A SECOND DAMPER CONTROL MODULE IS REQUIRED. BUS CONNECTION ABCD MUST BE CONNECTED BETWEEN BOTH DAMPER CONTROL MODULES.

_ SET BOTH DIP SWITCH POSITIONS TO ON (right position) AT SECOND MODULE ONLY TO ACTIVATE ZONES 5-8.

Zoning System Wiring Diagram Zones 5 - 8

Fig. 10 — Additional Damper Control Board Setup for Zones 5 - 8

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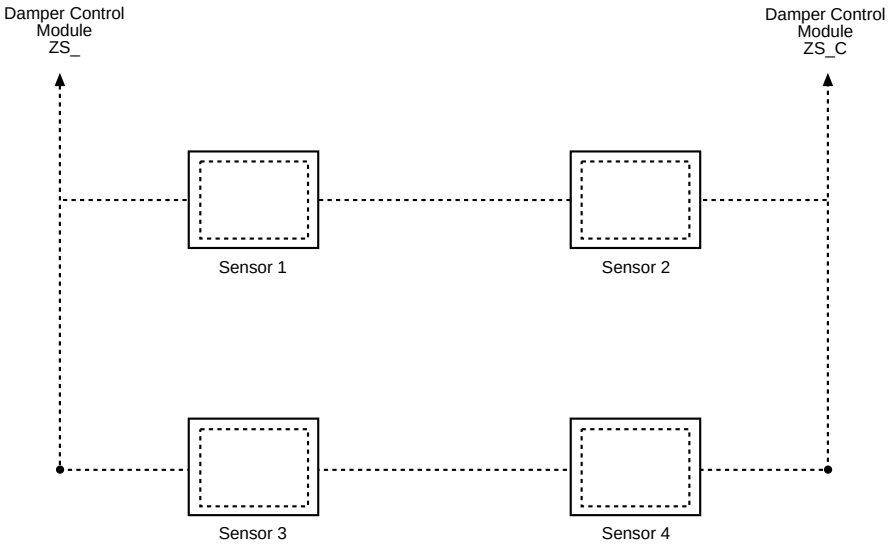


Fig. 11 — Remote Room Sensor Averaging 4-Sensor Application (series- parallel)

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TROUBLESHOOTING

Zoning User Interface Control does not power up:

1. Recheck wiring to ABCD on all devices. Make sure all colors match for every terminal.
2. Make sure power is applied to the indoor unit, and the Yellow and Green LEDs are lit on the Infinity Damper Control.
3. Check for 24 VAC between the C and D terminals at the User Interface terminal block.
4. Check fuse at indoor unit circuit board and Infinity Damper Control.

Zoning User Interface Display says, ″Indoor Unit Not Found″:

1. Recheck wiring to ABCD on all devices. Make sure all colors match for every terminal.
2. Press side button at User interface to try again.
3. Check power to indoor unit.
4. Disconnect all ABCD connections from every device and only reconnect the User Interface to the indoor unit. If the indoor unit is identified by the User Interface, then another device on the ABCD connection may be at fault. Reconnect each device's ABCD connection one at a time and perform a Re-Install from the Service Menu after each connection is made. If one or more devices are not found after reconnecting the last device, the last device may be suspect.
5. If the ABCD connection only contains an indoor unit and a User Interface, then the wiring, indoor unit control board, or User Interface may be at fault.

Zoning User Interface Display says, ″Outdoor Unit Not Found″, when applied with a two-speed communicating outdoor unit:

1. Recheck wiring to ABCD connector on outdoor unit. Make sure all colors match for every terminal.

Zoning User Interface cannot find Zones 5 through 8:

1. Make sure zone module 5 - 8 has the dip switches set to the far right.
2. Recheck wiring to the ABCD connections.

Zoning User Interface can find zones 5 - 8 but not 1 - 4:

1. Make sure zone module 1 - 4 has the dip switches set to the far left.
2. Recheck wiring to the ABCD connections.

Some zones do not provide enough comfort (a noticeable difference exists between the actual room temperature and operating set point or equipment does not turn on)

1. The zone airflow limit may be set too low. Perform the zone airflow limit checkout procedure. See Infinity Zoning System User Interface installation instructions for details.

Some zones provide too much airflow and are noisy:

1. The zone airflow limit may be set too high. Perform the zone airflow limit checkout procedure. See Infinity Zoning System User Interface installation instructions for details.

Zone dampers do not move:

1. Check fuse located on Infinity Damper Control. If fuse failed, check damper wiring and inspect for shorts. No more than five damper motors should be connected to a single damper output. Fuse should be replaced with an identical 3 amp automotive fuse.

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