iQ Zone™

POWERED BY ⓐIRZONE

Training Manual
Version 2.0 Release 007

CONTENTS

1. PRECAUTIONS, CERTIFICATIONS AND ENVIRONMENTAL POLICY

1.1. Precautions

For your safety and the equipment protection, follow the following instructions:
- Do not operate the system when wet or with wet hands.
- Connect the power supply cable, before connecting the AC power.
- Perform any connection or disconnection with the power supply powered off.
- Verify that there is no short circuited connection in the connectors between different cables or with ground.
- Verify for any abnormality in the wiring.

1.2. Environmental Policy

Do not ever dispose of this equipment with household waste. Electrical and electronic products contain substances that can be harmful to the environment if they are not given proper treatment. The symbol of the crossed container indicates separate collection of electronic equipment, unlike the rest of urban garbage. For proper environmental management, the equipment to be disposed must be taken to the proper collection center at the end of its lifespan.

The components part of this equipment can be recycled. Therefore, follow the existing regulations on environmental protection in your area.

The unit must be delivered to your dealer if it is being replaced or sent to a specialized collection center if discard.

1.3. Certifications

FCC verification:
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

UL verification:
Temperature Indicating and Regulating Equipment, Airzone System, which is comprised of a Master Control Unit Model CINNPL, a zone thermostat Model TINNPLTB and a zone control unit Model MINNPL.
This investigation is conducted in accordance with the UL Standards for Solid State Appliance Controls, UL244A and Temperature Indicating and Regulating Equipment, UL 873.

2. ZONING SYSTEM OVERVIEW

The IQ Zoning system has been designed to support a maximum of 8 zones, with a maximum of 32 Dampers. Each zone, have an associated Thermostat. Zones and Dampers can be associated in any combination from 1:1 to 1:24.

3. COMPONENTS OVERVIEW

The Zoning System is composed by three electronic components and a number of mechanical components like dampers and bypass, depending on the installation.

The electronic elements are:
1) Airzone Controller
2) Zone Module
3) Touch Thermostat

Optionally, the system may be fitted with remote temperature sensors.

3.1. Airzone Controller

The Airzone Controller is the main component of the zoning system. The controller is the interface between the zoning system and the IQ Controller and, at the same time, is the Zoning controller.

This element pulls information out from the Zone Control Modules and depending on the status of the AC system provided by the IQ Controller, it will manage the opening or closing of the dampers.

The Airzone Controller, will also provide all the information required by the IQ Controller, to control the AHU and the Heating and Cooling elements to operate at its highest possible performance.

If the Airzone Controller detects a communication problem with any of its components, it will relay the information to the IQ Controller, which, in turn, will show a message in its screen.

3.2. Zone Module

The Zone Module is another important part of the system. There will be one Zone Module per each Damper.

The Zone Module is the interface between the Airzone Controller, the damper, and the thermostat. When the Airzone Controller commands to open or close the damper, the Zone Module activates the damper motor accordingly and controls its operation, sending error messages to the local thermostat and to the Airzone Controller if the damper is out of order or blocked. Also, the Zone Module relays the temperature set point and measured zone temperature to the Airzone Controller periodically.

The Zone Module stores all parameters related with the zone and also have embedded additional capabilities, like accepting inputs from window/door contact, motion detector and the optional remote temperature sensor.

If the Zone Module detects a communication error with the thermostat or an operation failure with the associated damper, it will send an error message to the Airzone Controller, which in turn will relay it to the IQ Controller.

3.3. Touch Thermostat

The Touch Thermostat is the interface between the User or Installer and the Zoning System. The Installer will set the Zone Module parameters through the thermostat. Those parameters will be kept saved in the Zone Module during a power loss. As for the user, the thermostat will be used to set the zone temperature set point, local ventilation mode, Sleep mode and also the time schedule setup.

The Touch Thermostat will allow the user to access any other zone and set the set point temperature, without the need to go to the zone to make the change.

When the environmental conditions in a given zone, does not allow the installation in that zone of a Touch Thermostat a Remote temperature sensor is used. However, as already stated, a thermostat is required for each zone, therefore, in those cases the Touch thermostat has to be installed outside of that zone, while a remote temperature sensor, will be installed inside the zone area. In this case, the Thermostat temperature reading will be the one measured by the remote sensor.

4. ZONING SYSTEM OPERATION

Some important characteristics of the IQ Zoning System are:
1) It operates with 12 VDC.
2) It runs a single 4 conductor, stranded and shielded cable to all system elements.
3) The dampers are power open/power close.
4) The way the Airzone Controller communicates with the Zone Modules, is based in a communication protocol.
5) It communicates with the IQ Controller with only two data wires.

Because of the flexibility of the Zoning System, and the High Performance objectives, each zone requires the setting of some basic parameters, to be able to activate the system. Those parameters must be set by the installer at the initial power on the Zoning System, and before enabling the Zoning from the IQ Controller. Those basic parameters will indicate if the Zone Module will be a Master or Subordinate, the Zone Module address, and the Zone weight if this is defined as Master or the Master Zone number if defined as Subordinate.

Each individual Zone Module requires a different address to be able to communicate with the Airzone Controller. Zone Modules that will have a Thermostat connected to them will have address ranging from 1 to 8, and they are called "Master Zone Module", while Zone Modules that will follow a given Master Controller, will have addresses ranging from 9 through 32. Those Zone Modules are called "Subordinate Zone Modules".
While the Master Zone Module will have stored the Zone Weight, the Subordinate Controller will store the Address of the Master Controller to which it is subordinated.

Subordinate Zone Modules have to be used when a given zone requires the use of more than one damper, because of the ductwork layout. In such situation, to allow the whole zone to be properly conditioned, all dampers will need to be controlled by the single Thermostat connected to the Master Zone Module.

5. WIRING

The Zoning System wiring is very simple, but great care must be taken during its lay out and connection. All wiring must be laid out with Plenum Cable, AWG20, and Shielded type Belden 6402FE or equivalent. The cable should NOT be stapled in place. If it is required to have the cable fixed to any part of the building structure, clamps with cable protection should be used. DO NEVER strangle the cable.
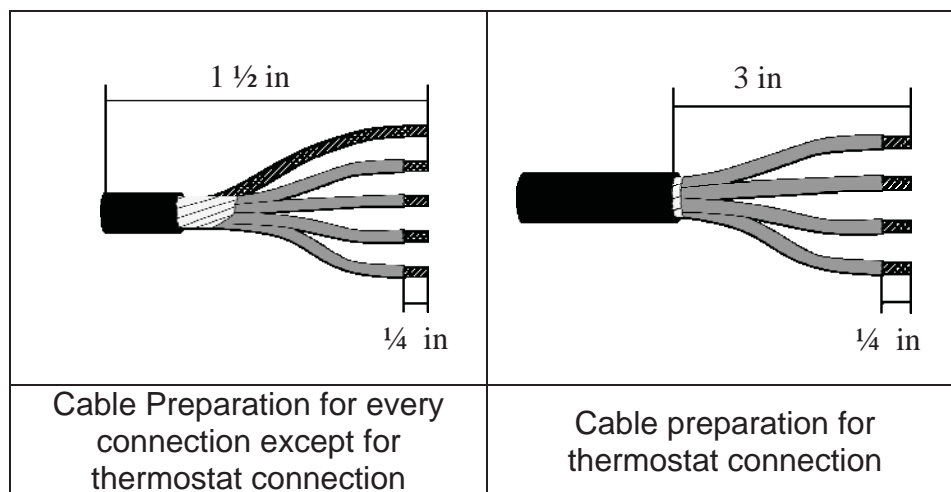
Not following these recommendations may result in an unreliable installation that will seriously affect the operation of the IQ Zoning system.

Wrong wiring is one of the two mayor causes of the installation problems. Care must be taken in following the cable or connector colors table, shielding, tightening of connector screws, short circuits, etc.
Another cause of installation problems is incorrect parameters setting. This can be avoided by writing down were each Zone Module is located and how are they configured (mainly Zone Module addresses, and master-subordinate relationship).

5.1. Preparing the Cables for Wiring

All wires that will end in a connector should be prepared as shown below. If the cable will end inside the thermostat base, then this is the recommended preparation of the cable without the shielding

| Cable Preparation for every connection except for thermostat connection | Cable preparation for thermostat connection |

Notice that when the cable ends at the thermostat base, the shield wire must be cut down, and the shield itself should finish outside of the thermostat base.

It is important to follow above recommendations to avoid installation problems related to electromagnetic noise, and undesired electrical contact.

5.2. Wiring Recommendations

Previous to the wiring lay out, draw over a plant schematic, where the thermostats will be located, and then where the dampers will be installed.

Based on the wiring lay out diagram, the cable can be layered out starting from where the Airzone Controller will be installed, (normally next to the AHU), and from there to the closest damper, and thus following to the other dampers in the System.

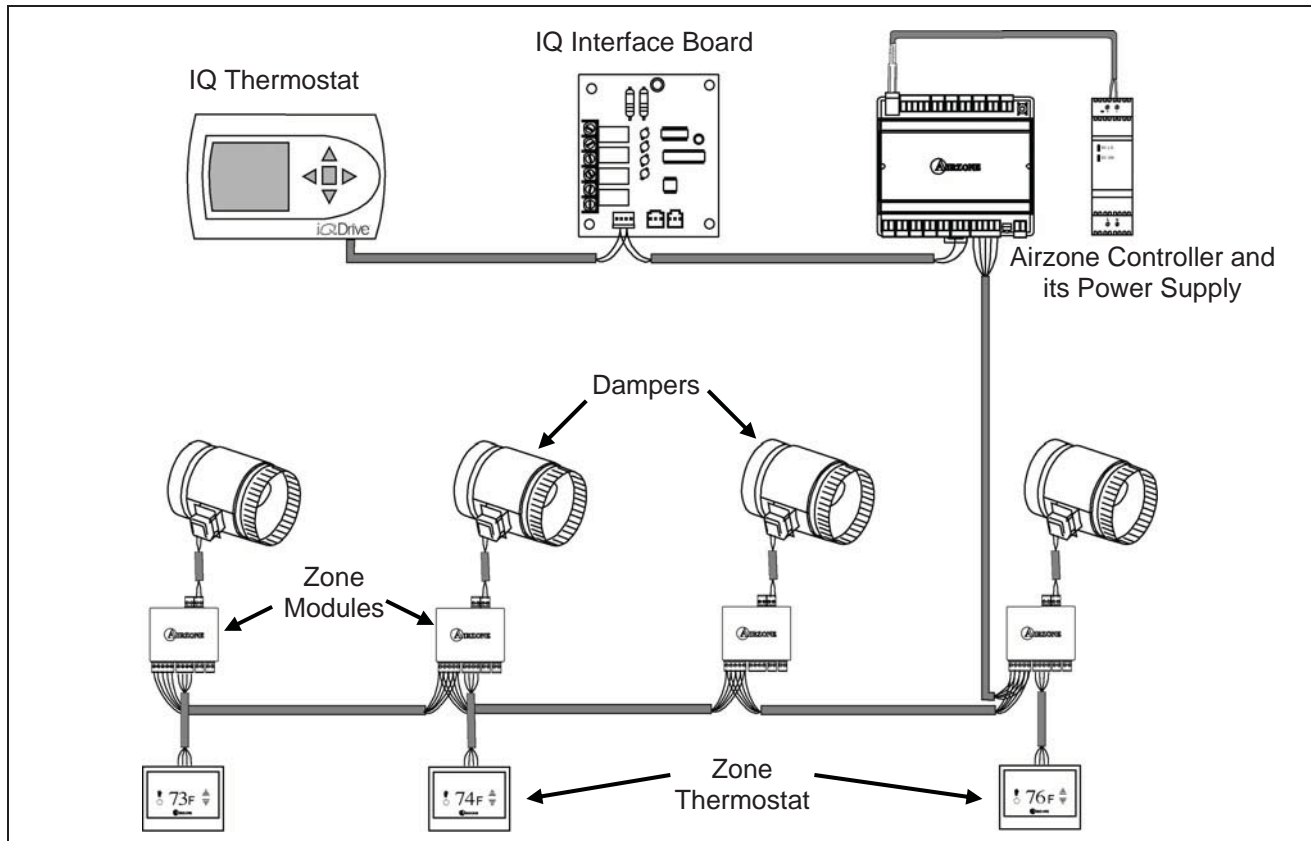Please, see below a typical wiring lay out and Daisy chain connection:

Fig. 1 – Daisy Chain Connection

As mentioned before, shielding is an important factor in the wiring, and it has to be correctly done. Always keep this in mind:

1) The shield will be connected only to one connector in the system, and that will be the ground connector in the Airzone Controller (Fig. 2).
2) **Intermediate Module's Connection** - At the Zone Modules, the shields of inbound and outbound communication cables, and the thermostat cable will be connected together, and isolated. Do not connect the shield to the Zone Module Connector (Fig. 3).
3) **Subordinate Intermediate Module's Connection** – At the Zone Modules, the shields of inbound and outbound communication cables will be connected together. Do not connect the shield to the Zone Module Connector (Fig. 5).
4) **Module's Connection at the end of the bus** – Connect together the shields of the inbound communication cable of the Zone Module and the thermostat cable. Do not connect the shield to the Zone Module connector (Fig. 6).
5) **Subordinate Module's Connection at the end of the bus** – Do not connect the shield to the Zone Module Connector (Fig. 4).
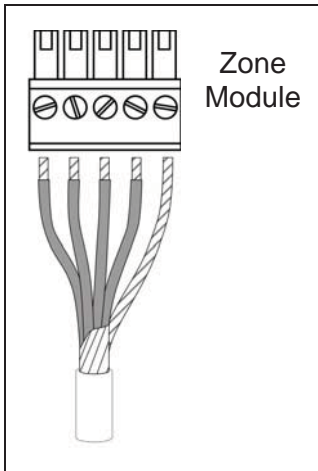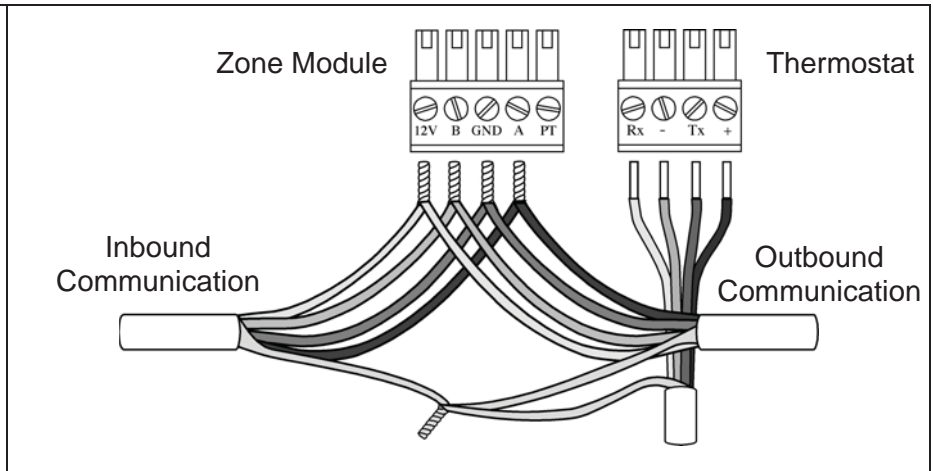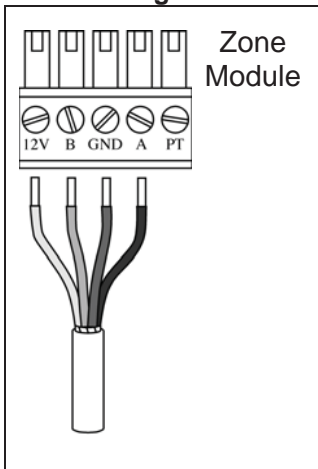
Fig. 2

Fig. 3

Zone Module

Zone Module

Thermostat

12V B GND A PT

Rx - Tx +

Inbound Communication

Outbound Communication

Fig. 4

Fig. 5

Zone Module

Zone Module

Thermostat

12V B GND A PT

Rx - Tx +

Inbound Communication

Outbound Communication

Fig. 6

Zone Module

Thermostat

12V B GND A PT

Rx - Tx +

Inbound Communication
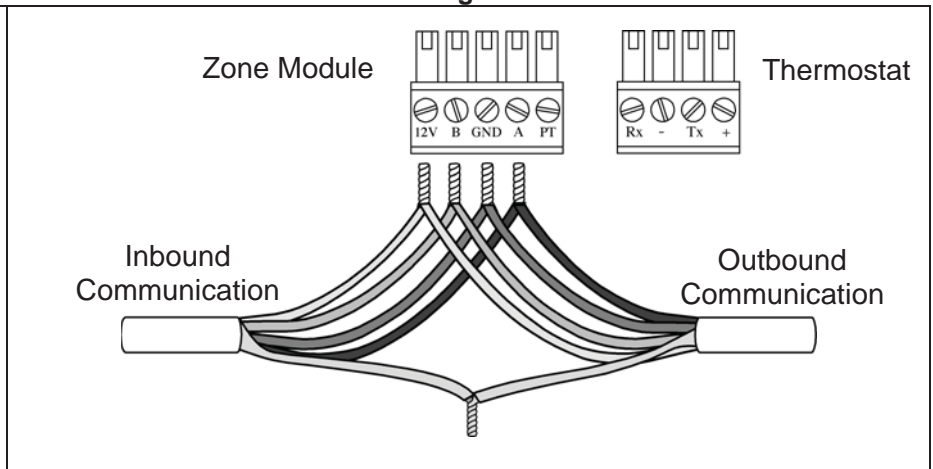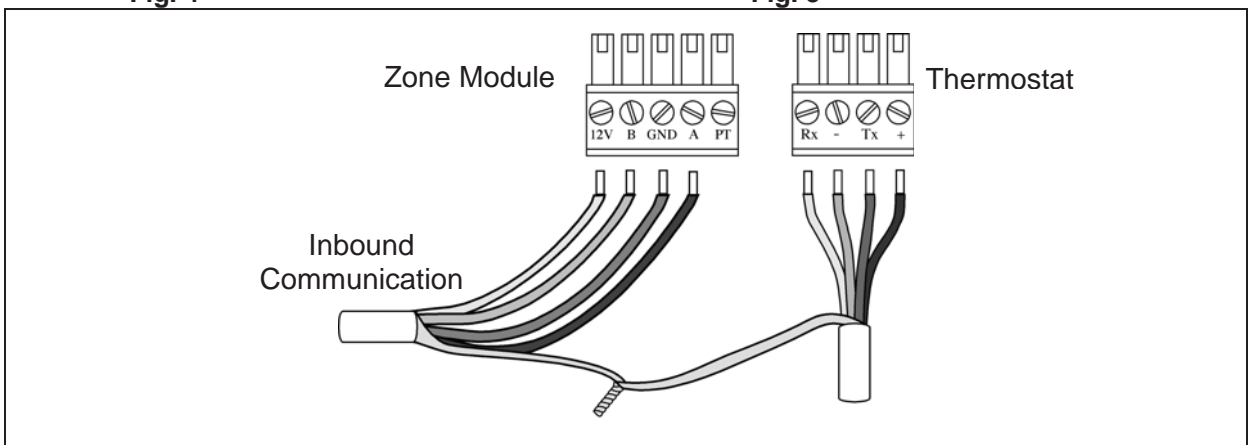
The cable that connects the thermostat with the Zone Module should not exceed 45 ft. Exceeding this length will cause zone operation malfunction.

There may be situations where the distance between the Thermostat and the associated Zone Module is more than 45ft. In cases like that, the Zone Module can be installed in some place closer to the thermostat. Obviously, such action will require extending the Damper motor cable. If the damper motor cable needs to be extended, AWG 18 bicolor cable is required. Be extremely careful to keep the color code when extending the motor cable. The Zone Module has engraved in the box "M+" and "M-" showing where the red and black cables

must be connected. If proper polarity rule is not followed, the damper will close when it should open and vice versa.

6. AIRZONE CONTROLLER DESCRIPTION AND CONFIGURATION

The Airzone Controller has several inputs and outputs as shown below:
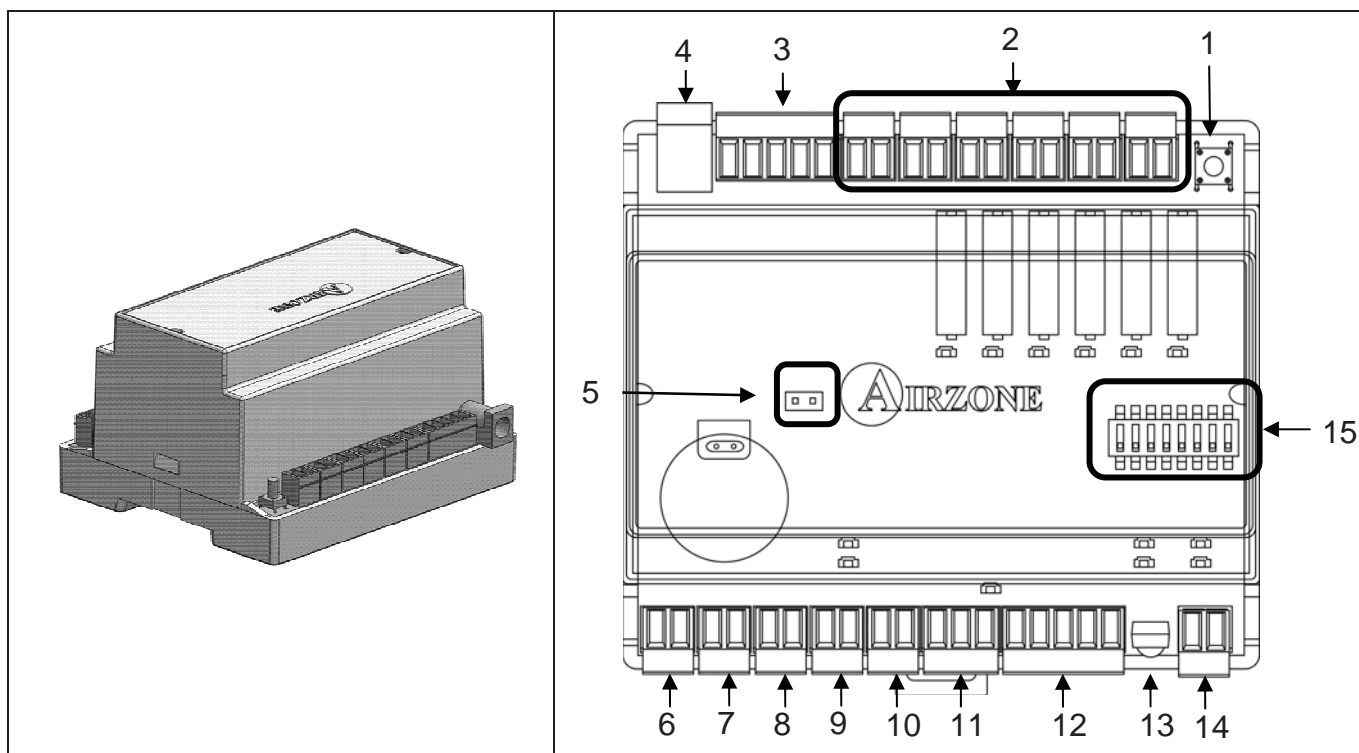
Nº	Description	Nº	Description
1	Set configuration push button	9	Fire Alarm Contact
2	Not used	10	Not Used
3	Not used	11	IQ Link
4	12VDC Input	12	Bus Connector
5	J2 Jumper	13	Not used
6	Supply Temperature Probe input	14	Not used
7	Not used	15	Microswitch bank
8	Not used		

- **12VDC**: The Airzone Controller must be connected to an Airzone Supplied Power Supply. That power supply can be connected to any voltage between 100 VAC and 240 VAC.

- **Set Configuration Push Button**: Once all modules are configured and there are no errors detected, the installer must press this button to save the configuration table in the Airzone Controller. The button must be kept pressed while the IQ Bus Activity/Configuration LEDs stay ON (please, see below IQ Bus Activity/Configuration LEDs).
 IQ Link: The cable that connects to the A and B wires in the IQ Interface Board must be connected to the A and B terminals of the three pins connector. A and B identification is serigraphied over the Airzone Controller PC board.

- **Bus Connector**: Also the identification for the cables are printed on the PC Board and the wiring must be done according with the following color coding.

Label	Color
Ground	Bare wire
A	White
-	Black
B	Green
+	Red

- **Fire Alarm Contact**: This contact is an open/close circuit sensor. It will detect fire alarm active when it detects an open circuit. If there is no fire alarm connected to it, this contact should be short circuited. (Normally this will be set by manufacturing). When a fire alarm condition is detected, the Airzone Controller will force all dampers to close, and will inform the IQ Controller of the condition, and the IQ Controller will force the AC unit to go to stop mode.
- **Supply temperature probe input**: This input requires a temperature probe connection (supplied with the Airzone Controller), to protect the unit from overheating or overcooling. This probe has to be installed in the supply duct, about 10 in from the AHU.

The Airzone Controller has a microswitch bank that must be set for normal operation. Only one switch has to be changed for normal operation.
Microswitch #8, Must be set to ON.
Microswitch # 6 Must be set to ON.
All other MUST be set to OFF (default).
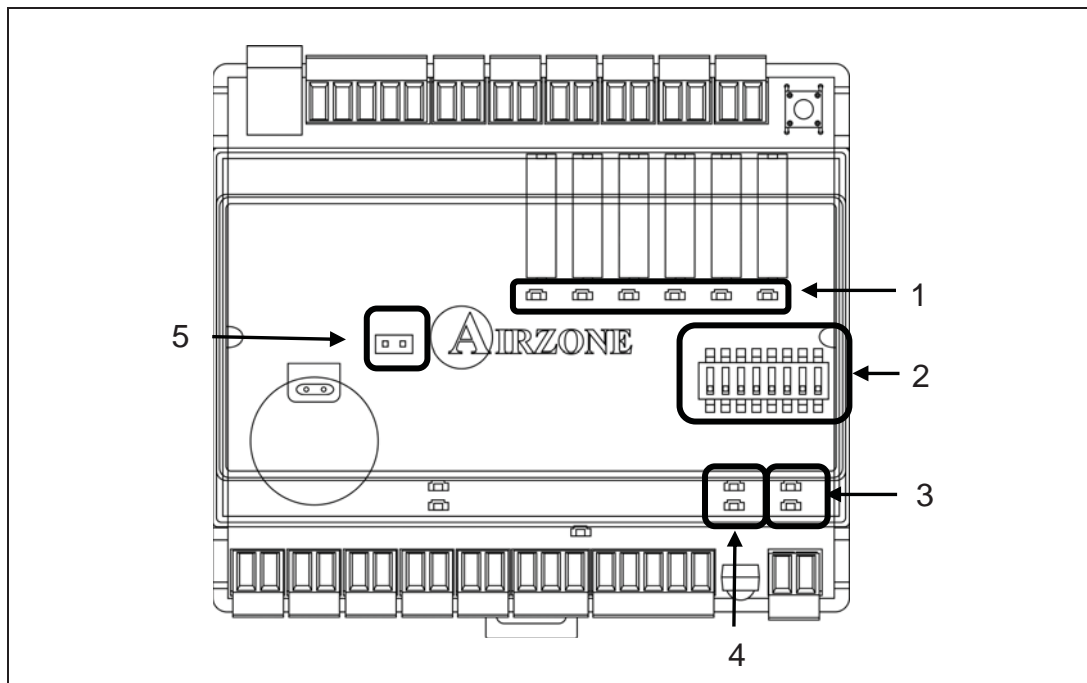
Nº	Description	Nº	Description
1	Mode LEDs	4	IQ Bus Activity/Configuration LEDs
2	Microswitch bank	5	J2 Jumper
3	Bus Activity LEDs		

There is also a Jumper (J2), which does not affect the system operation. However, before releasing the System for Customer use, this Jumper must be ON. The reason for this jumper is to keep the clock running in the event of a power shortage, and thus avoiding setup the time and time schedule set points.

In addition, the Airzone Controller provides visual information to help to diagnose some operation problems:
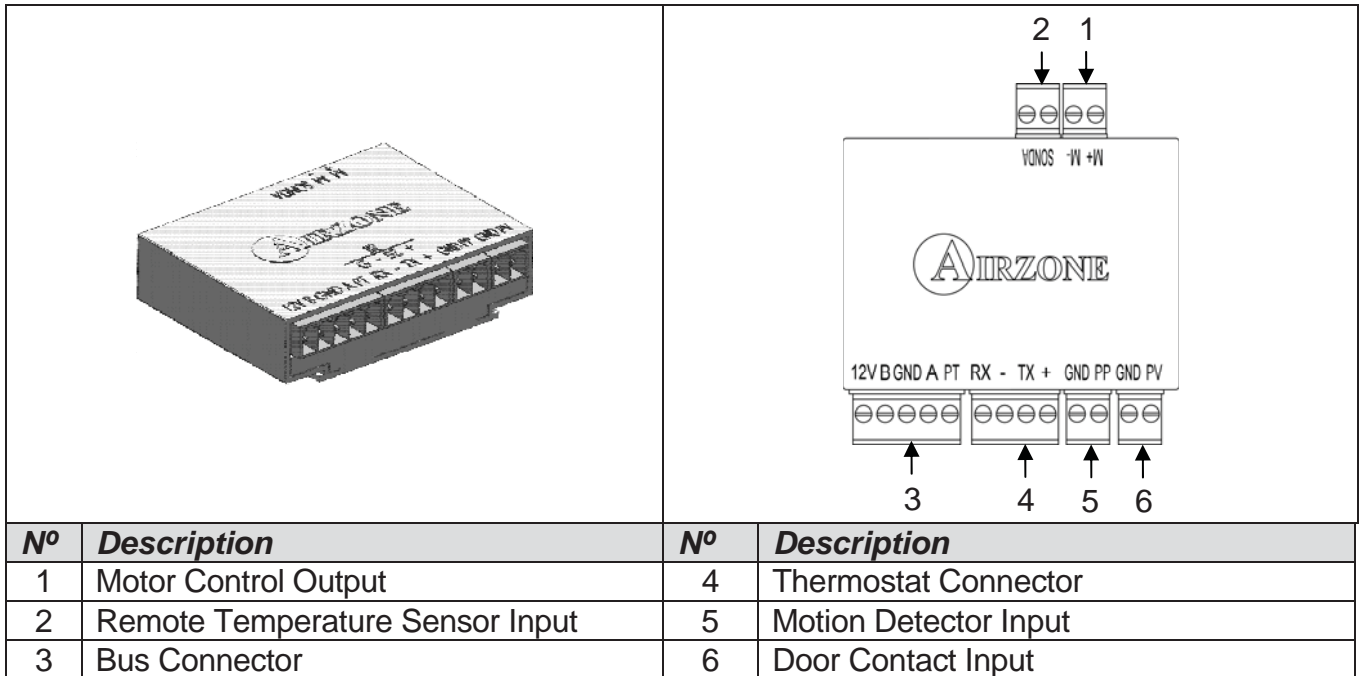
- **Power LED:** This is a red LED that will be ON all time the power supply is connected and active.

- **Mode LEDs:** This set of LEDs provides indication of which mode the IQ Controller has the AC unit working. These are the assignments:
    D4: Stop
    D5: Cool
    D6: Heat
    D7: Wide Ventilation
    D8: Zone Ventilation
    D9: Start Bit ON

- **Bus Activity LEDs:** This is a set of green/red LEDs. When the bus is running normally, both will be blinking. If only one is blinking (red), then it means that the bus is not connected to the Zone Modules.

- **IQ Bus Activity/Configuration LEDs**: In normal operation, this set of green/red LEDs blinking, indicates that the Airzone Controller is communicating with the IQ Controller. During the process of saving the configuration setup, the LEDs will be ON while receiving information from the Zone Modules, and will return to OFF once the configuration is saved.

The Airzone Controller must be installed mounted in a DIN rail, provided together with the controller, and next to the AHU.

7. ZONE MODULE

7.1. Connecting and Setting the Zone Module

The Zone Module has several connectors as shown below:

Nº	Description	Nº	Description
1	Motor Control Output	4	Thermostat Connector
2	Remote Temperature Sensor Input	5	Motion Detector Input
3	Bus Connector	6	Door Contact Input

- **Bus Connector**: This is a 5 terminal connector used to connect the internal bus cable. The function of each contact is engraved in the box.

- **Thermostat Connector:** This is used to connect the Thermostat cable to the Zone Module this is a 4 terminal connector. The function of each contact is engraved in the box.

- **Motion Detector Input:** This is a dry contact connector. If the user decides to use the functionality of the motion detector, its contact cable has to be connected here. DO NEVER use the 12VDC supplied to the Zone Module to power the Motion Detector. The motion detector is not provided by Airzone or Nordyne, and can be purchased in a hardware store. It has to supply NO or NC dry contacts.

- **Door Contact Input:** Same as before, this is a dry contact connector. If the user wants to use a Window or Door Contact, the device can be purchase in a hardware store, and it has to provide NO or NC dry contact.

- **Motor Control Output:** This two terminal connector connects to the damper motor. Engravings in the box shows M+ and M- signs to indicate the positive (red) and negative (black) wires to the motor.

- **Remote Temperature Sensor Input:** This is a two terminal connector, used to connect, when needed, a remote temperature sensor. The sensor has to be purchased with the IQ Zoning System. DO NOT USE any remote sensor from any other source.

AIRZONE

7.2. Configuration Parameters (Installer Parameters)

The Zone Module has a number of parameters that have to be configured. As indicated before, the Zone Module requires the use of a Touch Thermostat to proceed to its configuration.

This is a list of the parameters, its description, and ranges of selection.

- 2COn Indicates if the Zone Module will have a thermostat connected to it (ηAS) or will follow the lead of another Zone Module that has a thermostat connected to it. In this case, this Zone Module is called Subordinate, and it will have this parameter set to SUb.

  IMPORTANT NOTE: Given that Subordinate Zone Modules will not have a thermostat attached to them, it is required to connect a thermostat temporarily to it, to configure the Subordinate Controllers.

- 2C id **Zone Module ID:** This is the address that the Zone Module will have to be given so that it can be properly addressed by the Airzone Controller. There cannot be more than one Zone Module with a given address. If the previous parameter was set as Master, the range of addresses allowed is from 1 to 8; if the Controller was designed as Subordinate, the address range will go from 9 to 32.

- PErC **Zone weight Percentage**: If the Zone Module is configured as Master, the weight percentage must be entered into this parameter. This value goes from 10% to 100%, and represents the proportion of CFM that the zone is using, related to the maximum nominal CFM supplied by the AHU. This parameter will not be available in Subordinate Zone Modules.

- tC id **Thermostat Controller ID:** If the Zone Module is a Subordinate, it will be required to define this parameter. The range will be defined by the number of zones (or Master Zone Modules) in the installation. Only existing Master Controller's addresses will be shown when setting this parameter. For example if the Master Controller ID for the living room is 06, and a Subordinate controller needs to control a damper that will serve the living room, then the tC id for this Zone Module will be 06. It is very important that when configuring a Subordinate Zone Module, the Master Zone Module of that zone, is connected and the thermostat is ON, otherwise, that address will not be available to be selected. It is highly recommended to the installer to have an "installation Thermostat", that is, a regular thermostat with its cable, that can used as a tool to configure Subordinate Controllers and diagnose wiring problems on the installed thermostats.

- 2CPC **Zone Module Probe Configuration**: (Only in a Master Zone Module) When a remote temperature sensor have to be used in a Zone Module to measure temperature where environmental conditions are beyond the operational conditions required by the Touch Thermostat, this parameter must be set to rPt, otherwise should stay as default (OFF)

- 2CSi **Zone Module Sleep Input**: When the customer decides to use a motion detector to add one level of efficiency to the air conditioning system, this parameter has to be

activated in the Master Zone Module. The possible sets for this parameter, are *OFF* (default, no motion sensor attached), *nO* Motion Sensor attached, Activates when closing the circuit, *nC* Motion Sensor attached, Activates when opening the circuit.

- *ZCri* **Zone Module Remote Input**: When the customer decides to use a door or window contact detector to add one level of efficiency to the air conditioning system, this parameter has to be activated in the Master Zone Module. The possible sets for this parameter, are *OFF* (default, no remote contact sensor attached), *nO* Door Contact Sensor attached, Activates when closing the circuit, *nC* Door Contact Sensor attached, Activates when opening the circuit.

- *Sbdt* **Stand By Display Temperature:** This parameter allows to select if the thermostat will normally show the ambient temperature (parameter value *At*) or the set point temperature (parameter value *St*).

- *OFSt* **Offset**: This parameter allows the Installer to adjust the zone temperature reading in a range from -5ºF to 5ºF.

The following are read only parameters that allow the service person to know the firmware version of all elements in the system:

- *ZCFu* **Zone Module Firmware Version**
- *ZtFu* **Zone Thermostat Firmware Version**
- *SCFu* **System Controller Firmware Version** (Airzone Controller)

7.3. Zone Module Installation

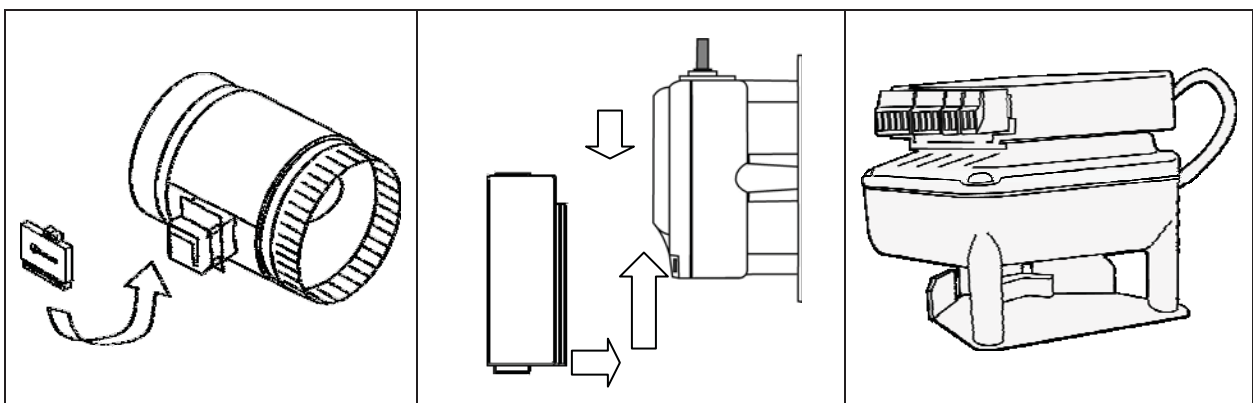The Zone Module is normally installed mounted to the Damper Motor, as shown in the figure below.

Fig. 7 – Zone Module Installation

8. THERMOSTAT

8.1. General Description

The Touch Thermostat, is the access panel for the installer to configure the Zone Module, and also, for the user to change the temperature setting for the zone and configure time scheduled set points.

There are no push buttons, jumpers or any mechanical hardware in the thermostat. The only access to the thermostat is its touch panel screen.

The thermostat measures the ambient temperature, and stores the zone's time schedule set points.

If the thermostat is set to OFF, it will normally have the dampers closed. However, when the IQ Controller sets the operation to wide ventilation mode, enters into calibration mode, or if the Zoning is disabled from the IQ Controller, all dampers will open regardless if the thermostats are ON or OFF.

Please, reference to the User Installation Manual to learn the use of the User Parameters and how to define the Time Scheduled Set Points.

8.2. Icon Description

It is very important to be familiar to the icons in the thermostat, not only for installation process but also to understand and support the end user, on service calls.

Following are shown the thermostat icons related to a given functionality, for simplicity reasons.

8.2.1. Normal display icons
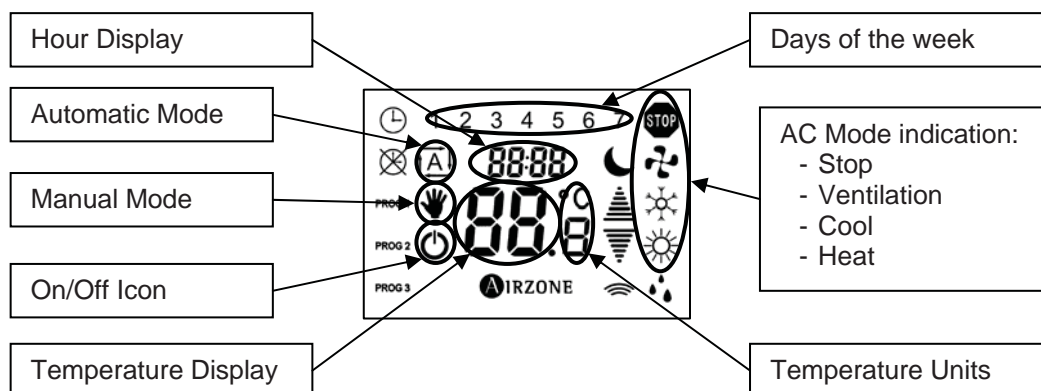
- **AC Mode:** The AC mode is set in the IQ Thermostat. When the temperature display is touched the Mode Icon will flash for 5 seconds.
- **Temperature Units:** It will show if the temperature reading is set for Celsius or Fahrenheit.
- **Temperature Display:** In normal mode, will show ambient the temperature. By giving a short touch on the display, it will show the set point temperature.
- **ON/OFF icon:** It is used to power the thermostat ON or OFF. If the thermostat is set to OFF, the associated zone will be inactive.

- **Manual Mode:** If on, it will indicate that the set point temperature is set manually. When the thermostat is used in Automatic Mode, Manual mode is the equivalent to Permanent Hold.
- **Automatic Mode:** When on, indicates that the thermostat is following a time schedule set points, and in such situation, the temperature display should show the set point temperature for the active program. The customer will not be able to change the current set point, unless it goes to Manual Mode first.
- **Hour Display:** In normal mode, it will show the time of the day, in 24 HR format.
- **Day of the Week:** It will show the current day of the week, being the number 1 Monday.

IMPORTANT NOTE: If the user sets the thermostat for Automatic Mode, and there is not a program set up for the current time and day, the thermostat will go automatically to OFF mode, and will stay there until the mode is set to Manual.

8.2.2. Temperature set icons
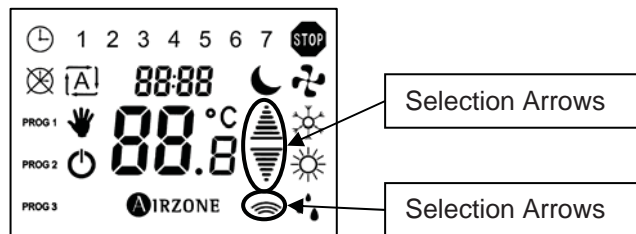
- **Selection Arrow:** The selection arrows will appear in the display when the thermostat enters in the set point temperature mode. The arrows will increase or decrease the set point temperature in 1 F or 0.5 C, depending on the units being used.
- **Data Transmission icon:** This is an important icon as it provides a level of troubleshooting. Each time a parameter or temperature is changed, that information is sent to the Zone Module, and the Data Transmission icon will flash, indicating that the data was sent. When an acknowledge is received from the Zone Module indicating that the information was received without errors and stored, the Manual mode Icon will blink once.

8.2.3. Time schedule set points icons
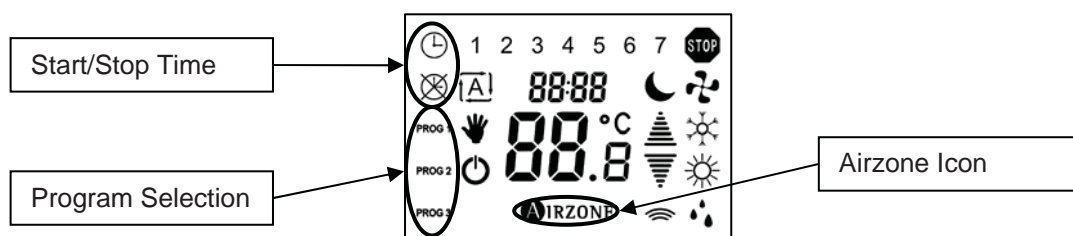
- **Start/Stop time:** The clean Clock Icon will blink to indicate that the day and time for a given program is the start day and time. Similarly, the crossed out clock blinking, indicates the program end time.
- **Program Selection:** These icons will appear when entering the time schedule set points, and will allow the user to select and configure any of the three program mode.

Airzone Icon. This icon will allow the installer and user to enter to different configuration modes, and when into the parameter configuration mode, it will be used to enable parameter change and to confirm its selection.

9. ZONING SYSTEM INSTALLATION PROCEDURE

Once the wiring is layered out and verified, proceed to connect the modules, power on the AZCB, verify the voltages in the thermostat bases, and install the thermostats on them. All thermostats should show the start up screen indicating that the initial setup should be executed.

As a general guideline, keep in mind that a blinking value for a parameter means that the parameter change is enabled. If the parameter is not blinking, make a short touch on the Airzone icon to enable the parameter change, and select the new value with the arrows. To set that parameter a short touch on the Airzone icon, will store that parameter in memory. When that happens, the parameter will stay on.

9.1. Initial Configuration

Be sure, before starting the initial configuration that all thermostats are ON during the whole process. If any thermostat at the initial power on shows a non blinking parameter, it means that was previously configured. In all cases like this, the installer has to make a module reset procedure (please see section 9.4 below).

9.1.1. Master controller initial configuration

As said before, at initial power on, all thermostats will start in the initial set up screen, requesting the set up of the three initial parameters of the associated Zone Module.

The first parameter to set, will indicate if the associated Zone Module will have a thermostat attached to it (master) or not (subordinate). Because the way the configuration process is designed, it is recommended that the Master Zone Modules are to be configured first.

This is the very first screen that the installer will see:

The default value will be flashing. When the Zone Module has a thermostat attached to it, this parameter has to be changed to MASER. To do so, push the up arrow once. Now, ⌐AS will be flashing. So set this parameter, touch on the Airzone icon once. That action will cause the ⌐AS to stay fixed, and the next parameter request will come to the screen.

After setting the Zone Module parameter to MASTER, the screen will show like the following:

```
  ZC id
  
⏻   0      ≜
   
  AIRZONE
```
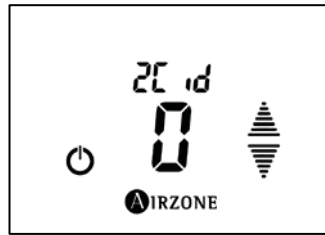
The second parameter, will request the installer to assign to the Zone Module its network address (ZC id). The address range for the Master Zone Modules is 1 to 8.

Initially, address 0 will be blinking, however, No Zone Module address can be configured as 0, therefore, the installer has to cycle to the next available address. If there are no other Zone Module already configured, the first number will be 1. However, the installer can choose any number from 1 to 8, by choosing the one desired with the arrow keys. If there is any other Zone Module already configured, its address will not appear as available when cycling the addresses with the arrow. For example, if there is one Zone Module already configured with address 2, when cycling the available address, it will show 1, 3, 4, 5, 6, 7, 8, and back to 1. Like before, when the selected address is flashing on the screen, by pushing the Airzone icon, it will set the parameter, and the screen will go to the third parameter, that it will be PErC.

PERC represents the Zone Weight. This is the Zone CFM related to the maximum nominal CFM delivered by the AHU. Given that the ductwork was designed to evenly distribute treated air to every room in the house, the size of the ducts converging to a given area will give the installer a good idea of the Zone's CFM share. For example if the AHU delivers 900 CFM (3 Ton unit), and the Zone takes 200 CFM, then the PERC will be (200/900) x 100= 22%.

The PERC range is from 10 to 100 in steps of 1. When cycling with the arrow keys, the display will show the balance of PERC remaining from 100, therefore if a zone was already configured with PERC= 20, the display will show 80, and the installer has to choose the percentage for the zone that is being configured. This is done to help the installer to properly adjust and balance the air distribution in the house. This is a very important factor to achieve maximum comfort and efficiency from the IQ Zoning System.

When the thermostat enters into this parameter setup, the display will look like the following

```
  PErC
  
⏻   10     ≜
   
  AIRZONE
```

When the selected value is flashing on the screen, a touch on the Airzone icon will set the parameter, and force the thermostat to the OFF mode, exiting from the initial set up mode.
Upon entering this parameter, the thermostat will go to OFF mode. Be sure to power it on back again before proceeding to configure the next Zone Module.

9.1.2. Subordinate controller initial set up

Once all Zone Modules with a thermostat attached to them are configured, all those Zone Modules that are subordinated to each Master Zone Module must be configured. To be able to configure those Zone Modules, a thermostat has to be temporarily connected to them. When connecting the auxiliary thermostat it will show the same screen as before.

The *2Con* parameter: In this case, it has to be set to *SUb*, with a touch on the Airzone icon. The following parameter, same as for the Master Zone Module, will be the address (*2C id*). In this case, though, the address available range will be from 9 to 32. Once the address is selected, the next parameter will be *tCI d*.

tCI d, stands for Thermostat Controller ID, or in other words, is the address of the Master Zone Module to which this Zone Module will be subordinated. When cycling with the arrow keys, the display will show the addresses of all those Master Zone Modules that have a thermostat connected to it. If the Master Zone Module does not have a thermostat connected to it at the time of the configuration, its address will not show as available. This is the reason why it is recommended to use a back up thermostat to configure the Subordinate Zone Modules.
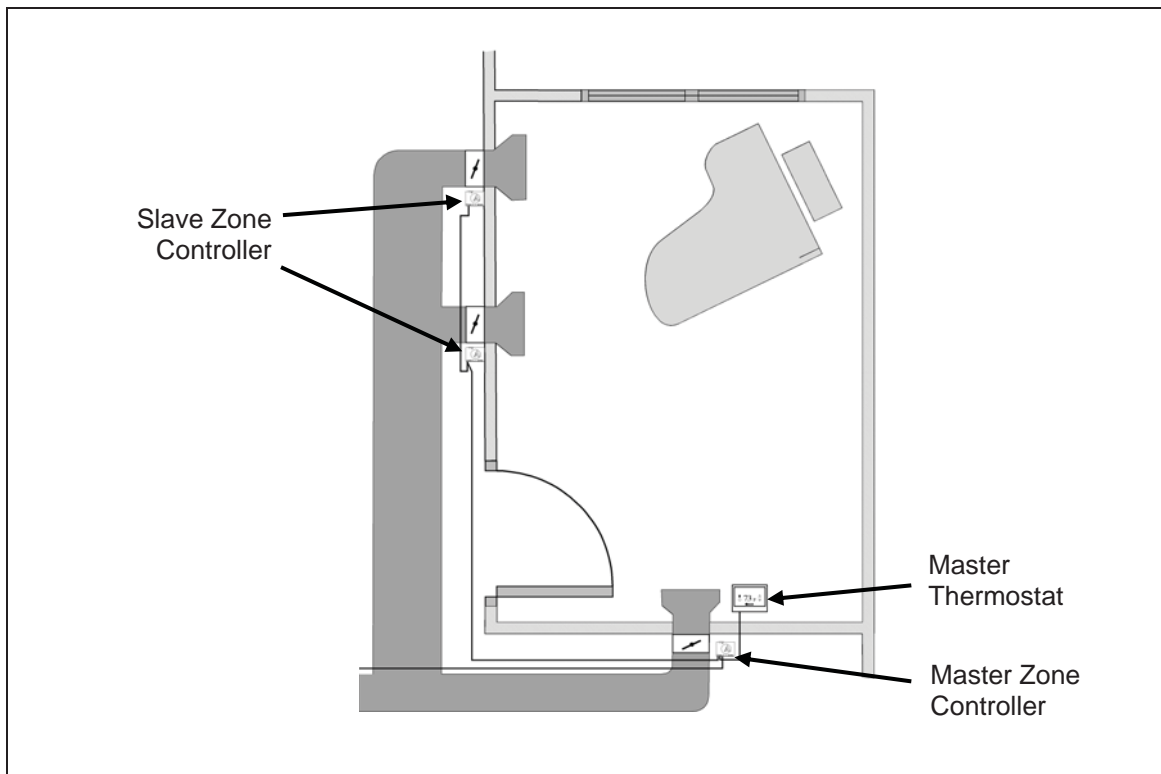
Fig. 8 – Subordinate controllers

The figure above shows an example of a Master Zone with two Subordinate Zones. While the Master Zone will have *2C id=03* and *tCI d=0*, indicating that it has a thermostat connected to it, the two Subordinate Zones have *tCI d=03*, indicating that they are Subordinates of the Zone Module 03. The addresses of the Subordinate Zones can be anyone between 09 and 32, and do not need to be sequential. The installer can choose any address of his/her choice.

Upon entering this parameter, the thermostat will go to OFF mode. Be sure to power it on back again before proceeding to configure the next Zone Module.

9.2. Zone Module General Parameters

9.2.1. Entering the installer's parameters area

After the initial configuration, the installer must configure the general Zone parameters, both in the Master Zone Modules and the Subordinate Zone Modules.

There are two steps to enter the Installer's Parameters area.
With the thermostat in OFF mode, like shown below,
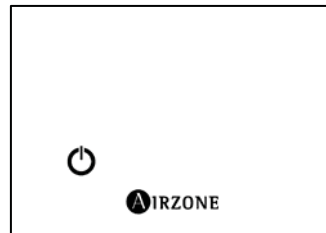
Push on the Airzone icon until the thermostat enters into the icon test mode, like shown in the figure below:

Once past the icon test, the thermostat will show the ambient temperature, but different from the normal mode, it will not show the Manual icon, neither the time, but the characters tEⁿP instead. That is to indicate that the installer can execute the second step to enter into the Installer's Parameters area.
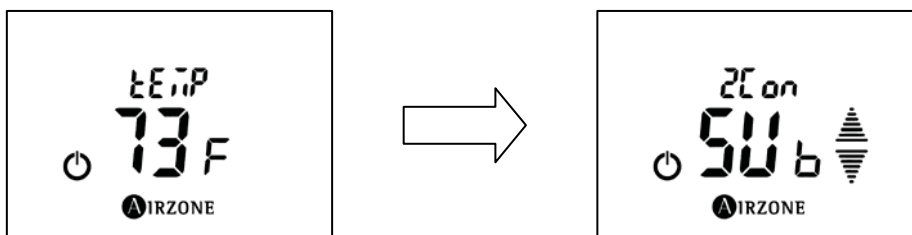
A second long push in the Airzone icon, will make the Zone Module to enter in the Installer parameters mode, and the first parameter (2Con) will appear in the screen, but this time the setting ⁿAS (or SUb if a Subordinate Zone) will be fixed.

When cycling the different parameters with the arrow keys, all will show fixed, either because they were previously set, or otherwise, they are the default values.
Cycling the parameters with the arrow keys, will have the following sequence:
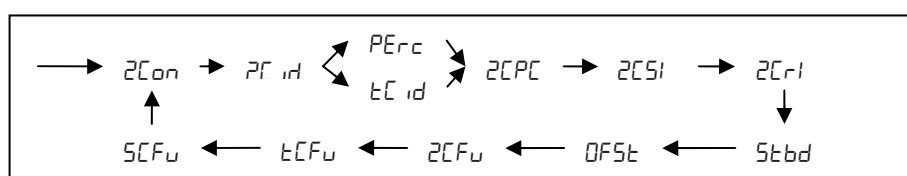
9.2.2. Changing a parameter

From the Installer's parameter menu, navigate with the up/down arrows until the parameter to be changed shows up.

Make a short touch on the Airzone icon to enable the parameter change. The current parameter will start blinking.

Change the parameter value with the selection arrows until the desired value shows in the screen.

Set the selected value, with a short touch on the Airzone icon. The selected value will stay on.

9.3. Existing the Installer Parameters Area

At any time during the configuration process, the installer can exit the Configuration Mode, by touching the ON/OFF icon to take the thermostat to the OFF mode, and again to bring it back to ON, in normal operation mode.

9.4. Resetting the Zone Module

If on the initial power on, the thermostat goes to the ambient temperature, which means that the Zone Module has already a configuration saved. It is recommended, in such situation, to reset the Zone Module, and proceed to configure it from the beginning. To reset the Zone Module to default values, follow this procedure:

Enter in the installer parameter area.

Temporarily, change the setting of the 2COn parameter. This action will force the Zone Module to enter into the reset mode.

Upon confirmation of parameter change, the next parameter that will show in the screen will be rSt.

Select ON with the arrow keys and confirm with Airzone.

The thermostat will go to the initial setup screen.

At this stage the thermostat is ready to enter in the Initial Configuration (chapter 9.1)

9.5. Activating the System Configuration

Once all parameters have been set, the installer needs to indicate the Airzone Controller that the configuration has been set, and the system is ready. This is done by pressing the Set Configuration button in the Airzone Controller. On pressing the Set Configuration button LEDs D13 and D14 will light. Keep pressing the button until both LEDs go off.
The Airzone Controller is now ready to be connected to the IQ Controller.

10. DAMPERS INSTALLATION

Dampers must be installed in full compliance with the local building code. The IQZoning dampers given they are not spring loaded, have no air flow direction restrictions. Always install the damper in such a way that there will be granted access for maintenance. If the damper has to be installed in a very difficult to access place, install the Zone Module away from the damper, in an accessible place, and extend the damper motor cables using AWG18, bicolor, two conductors stranded cable. In horizontal ducts, avoid when possible to install the damper with the motor underneath. Although the motor is protected, having the motor to the side of the duct is the ideal location.

11. BYPASS INSTALLATION

The zoning system supplies treated air exclusively to the areas that need it according to the user's selection. Since some zones are closed, part of the impelled air from the air conditioning unit must be diverted to avoid overpressures in the supply duct. This action is performed by the bypass damper thus maintaining a stable pressure in the duct.

11.1. Types of Bypass Dampers

Airzone has two types of bypass dampers to be used depending on the installation: free release bypass damper and ducted bypass damper

The following requirements must be satisfied for any type of bypass damper whether free release or ducted:

- The bypass damper gate must not interfere with the airflow coming from the return air flow
- There must be sufficient space in the installation site of the bypass damper so as to avoid any interference to the operation of the bypass damper counterweight.
- Easy access must be guaranteed to the damper counterweight in order to adjust the operation of the bypass damper.

11.1.1. Free Bypass damper

This type of bypass damper releases the surplus static air pressure into the internal unit closet. The location of this component is crosswise to the impelled air direction and next to the air handler, as shown in the following figures:
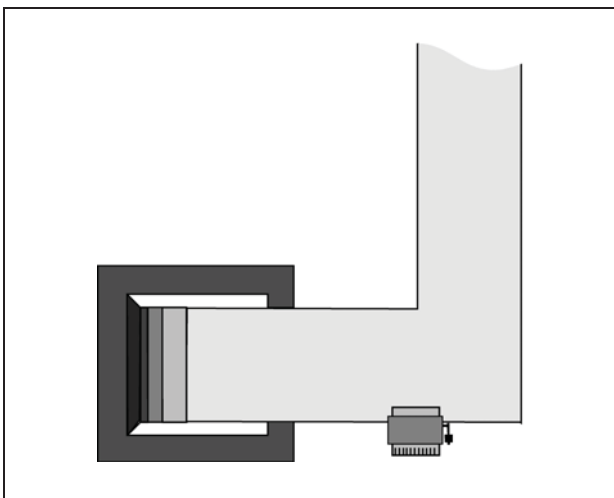
| **Fig. 9 - Correct placement of the Bypass Damper** | **Fig. 10 – Incorrect placement of the Bypass Damper** |
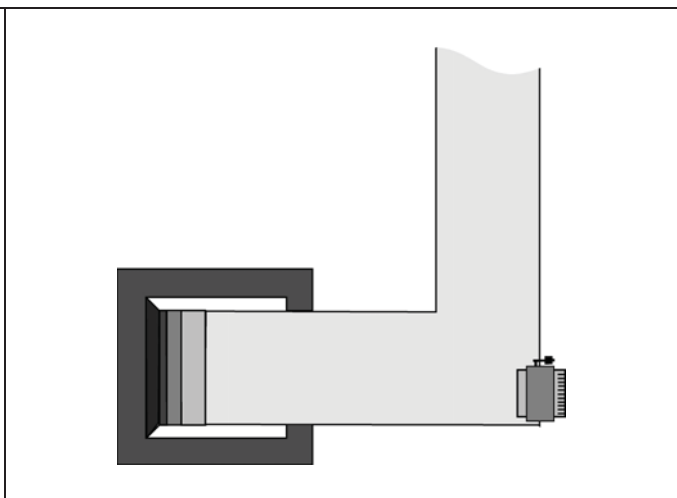
Airzone has two types of free release bypass dampers: rectangular and circular (the last is characterized by the fact that it can be used in both: free release and ducted bypass dampers). Traditionally, the rectangular bypass damper is installed in rectangular fiber ducts while the circular bypass damper is usually installed in plenums with flexible ducts.

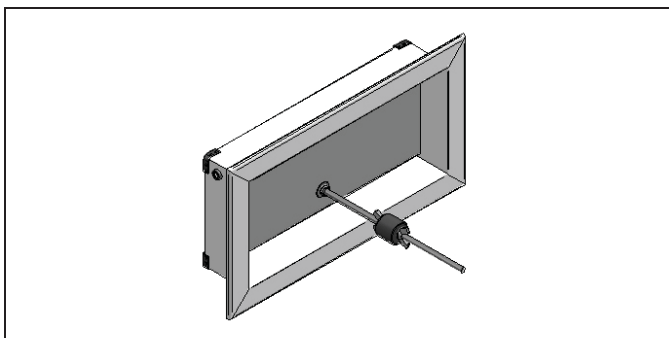A circular bypass damper installed in a plenum must meet the same specifications as a rectangular bypass damper.
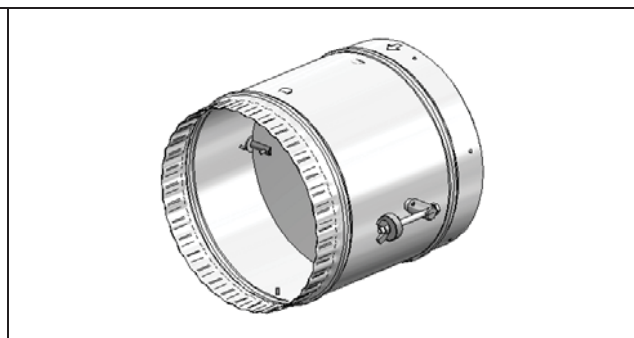

| **Fig. 13 – Rectangular Full-Return Bypass Damper** | **Fig. 14 – Circular Bypass Damper** |

11.1.2. Ducted Bypass damper

This type of bypass damper releases the surplus static air pressure from the impelled air duct to the return duct thus linking both ducts. These bypass dampers are specifically designed to be inserted into another duct in order to be connected with the return duct. The placement of this component is crosswise to the impelled air flow as shown in the following figure.
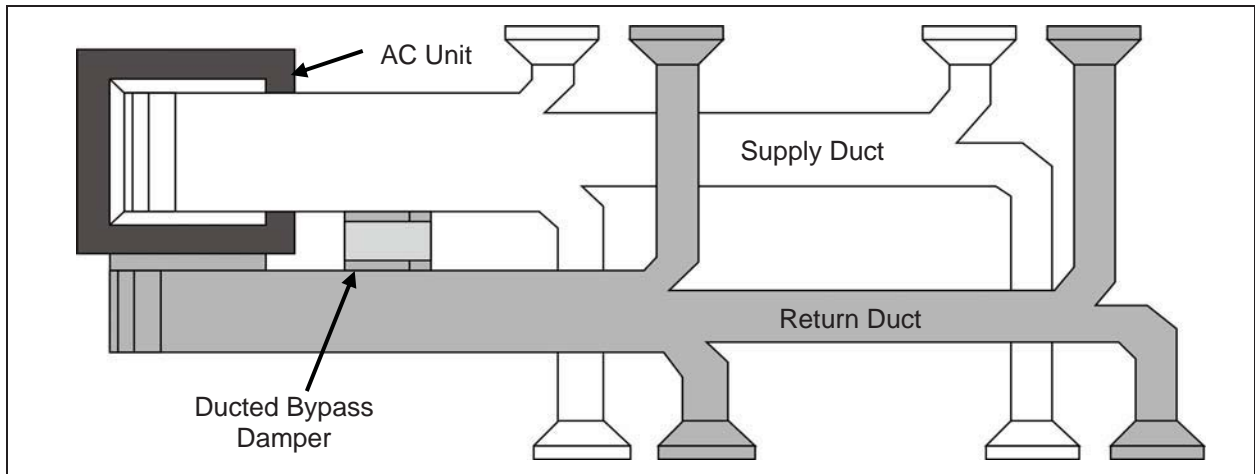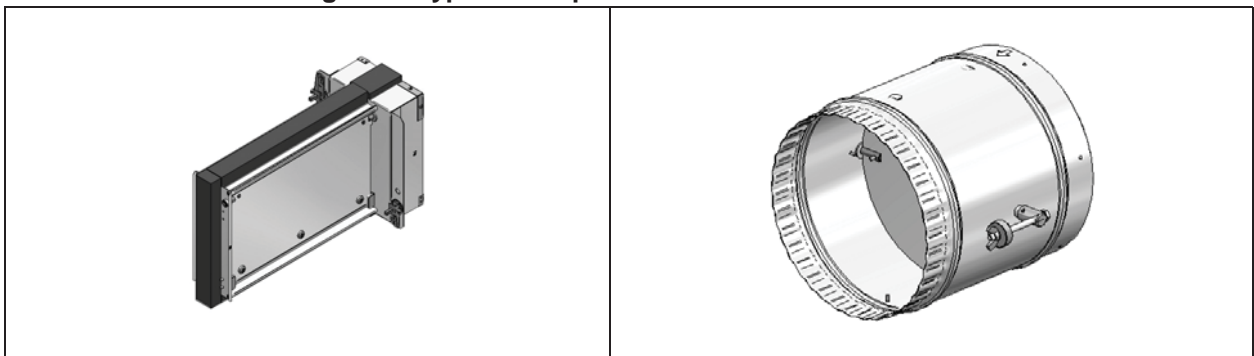

Fig. 15 – Bypass Damper in Controlled Return Ducts

Fig. 16 – Controlled Rectangular Bypass Damper

Fig. 17 – Circular Bypass Damper

11.2. Bypass Damper Installation Recommendations

The following recommendations should be followed for a correct operation of the bypass damper:

1) In view of the fact that bypass dampers are directional, verify that the gate opens in the same direction as the impelled air flow (from the supply duct to the grilles).
2) Verify that the rotation axle of the bypass damper has been installed horizontally.
3) Verify that the counterweight has been installed in the threaded rod of the bypass damper as shown in the above figures.
4) Verify that the location of the bypass damper is easily accessible for adjustments.
5) Verify that the gate moves without anything hindering its motion.

12. SUPPLY TEMPERATURE PROBE

The supply temperature probe provides the measurement of the supply air temperature in order to inform the iQ Controller.
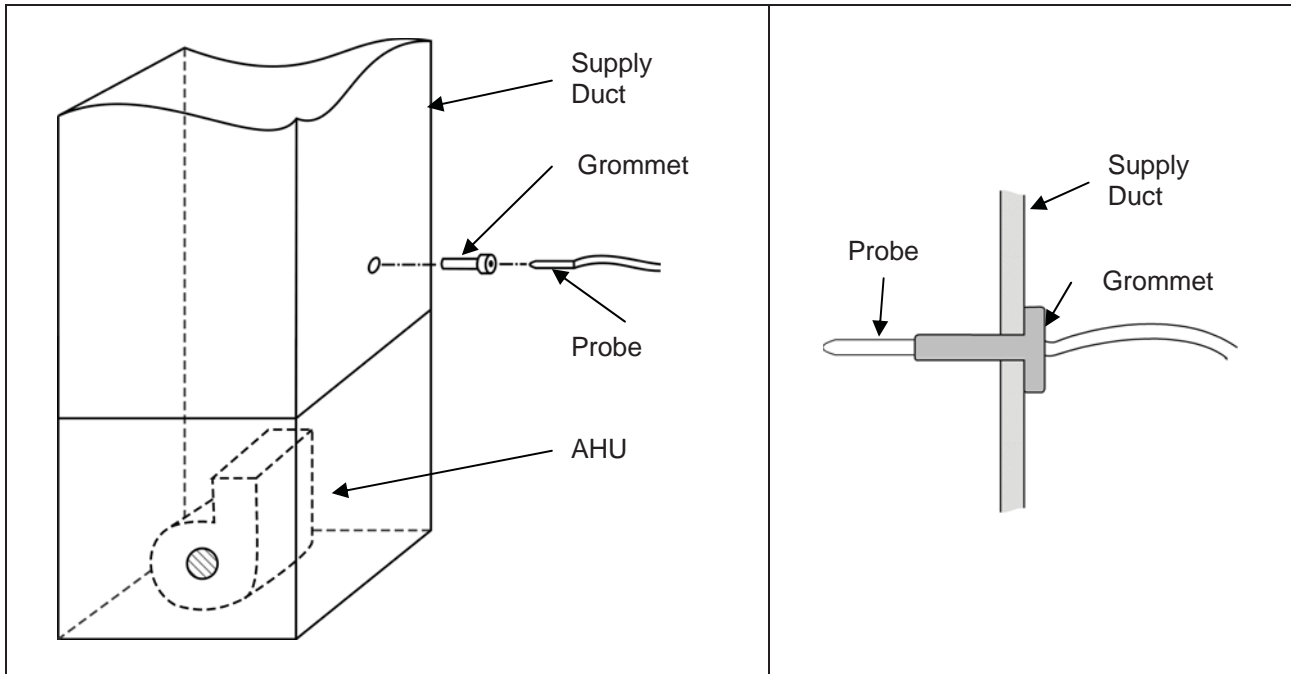

Fig. 18B – Supply Temperature Probe

The following recommendations should be followed for a correct installation of the supply temperature probe:

1) Drill the duct with a ¼ inch in (6mm) diameter at the location of the probe.
2) Insert the grommet in the gap, fix it using aluminum tape.
3) Insert the supply temperature probe about ¾ inch and fix with aluminum tape.

TABLE 1: INSTALLER PARAMETERS

PARAMETER	DESCRIPTION	VALUE
2COn	Zone Module Type	ⅢAS - SUb
2CId	Zone Module Address	I-8 9-32
PErC	Percentage (Only for Master Zone Modules)	I0 - I00
tCId	Master Zone Module Address (only for Subordinate Zone Modules)	I-8
2CPC	Zone Module Remote Temperature Sensor (Only for Master Zone Modules)	On-OFF
2CSI	Zone Module Door Input (Only for Master Zone Modules)	OFF-nC-nO
2CrI	Zone Module Motion Detector Input (Only for Master Zone Modules)	OFF-nC-nO
Sbdt	Stand By display temperature (Only for Master Zone Modules)	At-StP
OFSt	Temperature display offset (Only for Master Zone Modules)	I-5
2CFu	Zone Module Firmware Version	Read Only
2tFu	Thermostat Firmware Version	Read Only
2CFu	Airzone Controller Firmware Version	Read Only

AIRZONE

TABLE 2: TROUBLESHOOTING

ERROR	DESCRIPTION	CORRECTIVE ACTION
Err 1	Local communication error	• Check the connections and wiring between the zone control and the thermostat
Err 2	Bus communications error	• Check the zone control's connection to the bus.
Err 3	Damper not connected	• Check the zone control's connection to the motorized system. • Check that the motorized system is not free.
Err 4	Damper blocked	• Check that the zone control's connection to the motorized system has not shorted out. • Check that the motorized system is not blocked.
Err 5	No zone control sensor	• Check that the circuit of the sensor connected to the zone control (if any) is not open. • Check the configuration of the "2cPc" parameter.
Err 6	Zone-control sensor short-circuit	• Check that the circuit of the sensor connected to the zone control (if any) has not shorted out. • Check the configuration of the "2cPc" parameter.

Whenever the system detects an error, the message "Err" will be displayed in the zone where the error has occurred. To consult the relevant error code, press "Err" when it appears.

Errors 1 and 2 have a blocking effect, and if either of them appears the thermostat cannot be used until the error has been fixed. For the other errors, the letters "Err" will appear on the hour digits. Pressing them displays the error code on the temperature digits.

Press the Airzone icon to clear the error and return to normal mode.
The grille and sensor errors (3, 4, 5 and 6) will only appear if these components have been set up (the grille is set up by default and the sensor not).

TABLE 3: CABLE DISTANCES

Between	AWG	Distance (ft.)	Condition
Airzone Controller to nearest Zone Module	20	20	WCS
Zone module to next Zone module	20	20	WCS
Thermostat to Master module	20	45	MAX
Zone module to Motor	18	65	MAX
Remote temperature sensor to Master Module	20	65	MAX
Total wire length in the network	20	650	WCS

Condition references:

> **WCS** – Worst Case Scenario
> **MAX** – Maximum Allowed

Those cases indicated by WCS, are based in an installation including 32 Zone modules. Maximum distances will depend on the number of modules needed. If distances longer than those in the table are required, please fill up the table below and send it back to Airzone USA for feasible review.

From previous module to module #	ft		From previous module to module #	ft		From previous module to module #	ft
1			12			23	
2			13			24	
3			14			25	
4			15			26	
5			16			27	
6			17			28	
7			18			29	
8			19			30	
9			20			31	
10			21			32	
11			22				

The first distance (module 1), is the distance between the Airzone Controller and the first module.

![AIRZONE logo]

ANNEX A: POWER SUPPLY

The non autonomous power supply has been designed to provide the necessary current and voltage to the Airzone zoning system.

The supplied power supply is a switching type and can be connected to any AC voltage between 100 V_{AC} and 240 V_{AC}. A bicolour cable with the power connector is included with the power supply.

There are clear identifications in the power supply for voltage in and out and polarity. Please, follow them carefully.

The power supply also includes a DIN rail, where it should be assembled, as explained in the Installer's Guide included in the Airzone Controller Board.

There are no ground connections to the power supply.
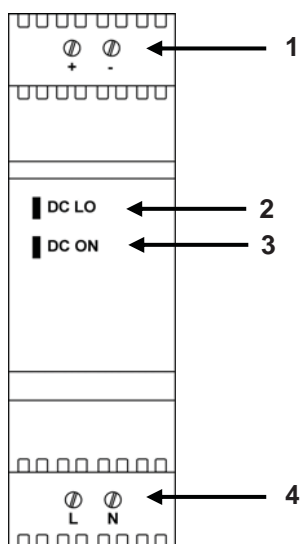
Nº	Description
1	Power supply 12 Vdc
2	Error indication LED (red)
3	Operation LED (green)
4	Power supply 110 Vac

Zone and Module Identification Sheet

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	
Master Module (1-8)									
Zone Weight %									= 100%

Zone Identification

Zone	Room(s)	Thermostat Location	Notes

Module/ Damper Location Sheet

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