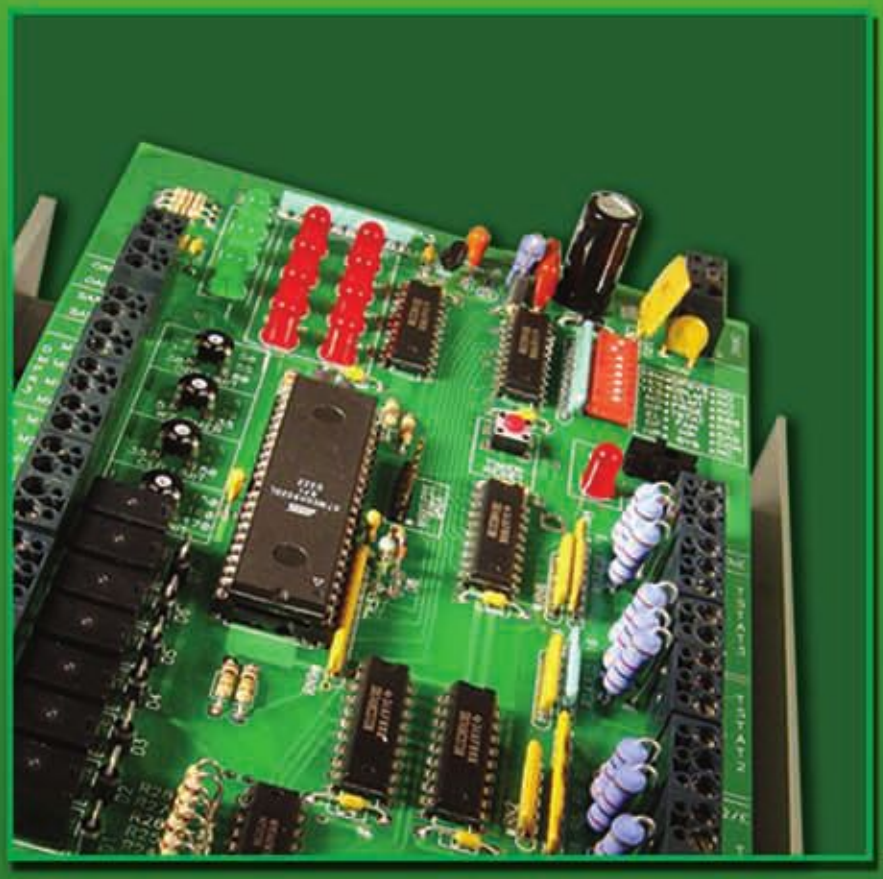
DURO DYNE®

DuroZone®

Your Source For Home Comfort!



Product Catalog

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Certified to ISO 9001:2008
TÜVRheinland Precisely Right.

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U.S. GREEN BUILDING COUNCIL MEMBER®

DuroZone

Table Of Contents

What is zoning and why is it needed?

When you enter your home in the evening and you turn on a light switch, do all the lights in your entire home come on? No! That would be ridiculous. The lights for the occupied room, and that room only, come on. Can you imagine the expense of running all the lights in the house just to have light in one area of your home? You would never have one light switch for the whole house, so why would you have one thermostat? Not only would one thermostat be inconvenient, expensive, and uncomfortable, but also it is unnecessary with today's technology. The lights in your home are separated into occupied areas (zones) and your heating and cooling system should be as well. A single thermostat downstairs cannot read the temperature upstairs. Similarly, a thermostat in the master bedroom of a home cannot sense the temperature in the dining room. The result in either situation is the inability to be comfortable in all areas of the home at the same time.

If you have a forced air heating or cooling system, without zoning, the whole house is heated or cooled when one thermostat calls. Each time you adjust the thermostat to compensate for an area that is under heated or under cooled, other areas become over heated or over cooled as the equipment supplies conditioned air to the whole home. Consider the time it takes for the comfort you desire to reach you, while the areas that did not require conditioning are being over heated or over cooled. You are expending energy and incurring cost to create an uncomfortable environment in an area of your home. With zoning, the only area to achieve the condition you desire is the area you choose.

Zoning allows you to receive the comfort, control, reliability, and efficiency that best suits your needs. So the real question is how much you are you willing to pay for that which you do not want or need. Without zoning, each time your equipment comes on, you are paying to condition areas that do not need it.

Zoning with DuroZone means **comfort**; conditioned air is directed only to the areas that need it.

Zoning with DuroZone means **control**; each area zoned is its own temperature-regulated environment.

Zoning with DuroZone means **reliability**; you experience the right temperature at the right time in all zoned areas with durable DuroZone products.

Zoning with DuroZone means **efficiency**; heating and cooling needs are focused only where you desire. Your home equipment may operate less, use less fuel, require less service and last longer due to the diminished demand upon it.

What makes DuroZone so different from other zone systems?

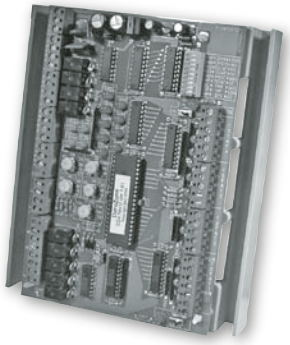
At DuroZone we have taken the time to produce zoning equipment that is easy to understand, easy to install, and easy to service. Some of our value added features are:

• GASKETING ON RECTANGULAR DAMPERS FOR A PRECISE FIT •
•MULTI-SIZE RECTANGULAR DAMPERS•
• WIDE CHOICE OF ZONE DAMPER AND MOTOR COMBINATIONS•
• SOLID ALUMINUM RECTANGULAR DAMPER CONSTRUCTION REQUIRING NO CHANNELS OR SUPPORTS •
• DAMPER DESIGN CAPABILITIES OF UP TO 800 SQ. IN. •
• FRESH AIR INTAKE CONTROLS •
• CONTROL PANELS WITH SIMPLE MECHANICAL RELAY OPERATION •
• ELECTRONIC PANELS WITH FRESH AIR OPTION, COMPRESSOR AND HIGH LIMIT PROTECTION AND MORE •

To prove our faith in the product we manufacture we offer a **Five Year Limited Warranty.** This is a "no hassle" warranty covering all DuroZone products. With DuroZone you can now offer your customer the best and most reliable zoning product available.

Zone Control Panels

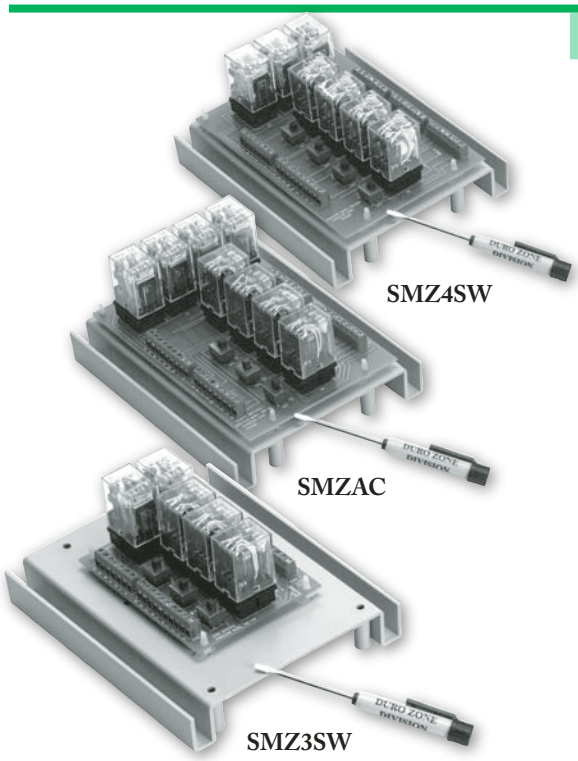
RED4 Zone Panels



RED4

The RED4 is a configurable microprocessor based control panel. It is suitable for use with gas/electric, oil, electric, conventional, and dual fuel heat pumps with two stages of cooling. "DIP" switches on the panel allow the contractor to program this panel to operate in virtually any application. The RED4 panel is protected by a built in circuit breaker and is compatible with almost any thermostat on the market. The RED4 can also be programmed for fresh air intake in accordance with local codes.

SMZ Zone Panels



SMZ4SW

SMZAC

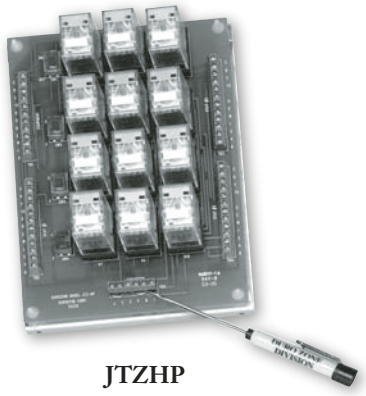
SMZ3SW

DuroZone's SMZ-SW Panels provide contractors with a simple, low-cost single stage zoning system for 2, 3, or 4 zones. SMZ-SW Panels require the use of a switchable subbase (which must have separate B & O terminals) in Zone 1 to act as the system's master switch for heat, cool, and fan functions. SMZ Panels are relay based systems, and are not sensitive to temperature or "electrical noise". So, SMZ's can be mounted virtually anywhere.

SMZ-AC Zone Systems are auto changeover panels that do not require separate B and O terminals on the thermostat. SMZ-AC can control 2 stages of heat and 2 stages of cooling.

All SMZ Zone Systems are equipped with individual zone damper control switches. These switches will allow a zone damper to remain in either open or closed position when the system is at rest. By setting the switches, the installer or home owner can choose the position of his system's dampers; to inhibit or allow air flow when the system is in constant fan mode.

JTZ Zone Panels



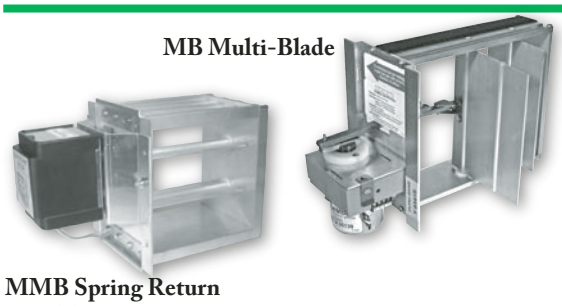
JTZHP

This system introduces features unique to the needs of heat pump applications. DuroZone's JTZ-HP Panel is a low cost expandable zoning system for use with heat pumps. The JTZ-HP can control three or more zones on a single unit. The switchable thermostat subbase in Zone 1 acts as the selector switch for heat, cool, emergency heat and fan functions. When all zones are satisfied, all zone dampers will be open to allow air circulation. Moving the fan switch on the Zone 1 thermostat subbase to "on" will activate the fan to enhance air movement. DuroZone's JTZ-HP panel has Y1 and Y2 terminals to allow operation of heat pumps with 2 stage compressors and will operate changeover valves activated in either the heat or cool mode. Dual fuel ready uses heat pump thermostat in every zone.

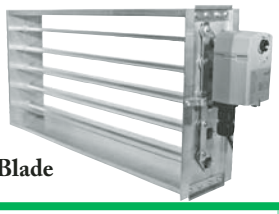
Dampers

Multi-Blade Dampers

MB Multi-Blade



MMB Spring Return
Mid-Torque Multi-Blade

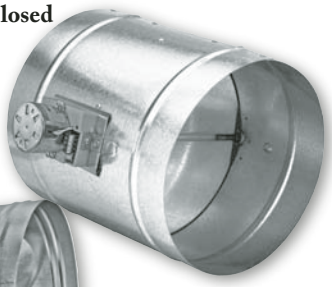


SMB Spring Return
High-Torque Multi-Blade

The DuroZone Multi-Blade damper for residential zoning systems has been engineered to include many features. Ribbed for strength and extruded from lightweight aluminum, the sleek frame profile provides maximum strength without excessive reduction of free area inside the ductwork. The extruded aluminum blades are mounted with friction minimizing nylon bushings to provide easy transition between opening and closing. The DuroZone Spring Return Multi-Blade Dampers also feature damper blades designed to remain within the damper frame for easy insertion and an external side-mounted linkage for smooth and quiet operation. Multi-Blade dampers are available in 74 stock sizes with a 24-volt spring return "Mid-Torque" motor or a Power Open/Power Closed motor. An optional Spring Return High Torque motor is also available.

Round Dampers

Power Open/Power Closed
Round

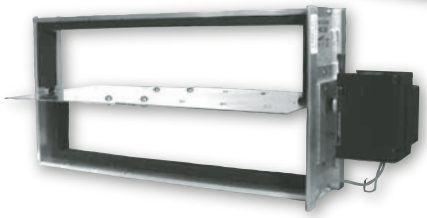


High-Torque
Round

DuroZone round dampers are made of galvanized steel with reinforcing beads for maximum durability. Round dampers are available with different motor options: Power Open/Power Close, Mid Torque Spring Open/Power Close and High Torque Spring Open/Power Close. The single blade design insures smooth operation and efficient sealing for maximum control of air flow. The round housing is suitable for use with flexible ducting or round sheet metal duct.

Multi-Size Dampers

Multi-Size



Multi-Size
Spring Return

Since each damper of this series is adjustable, the eight different sizes available will adjust to 30 of the most common duct size requirements. This, coupled with an extruded aluminum frame and formed aluminum blade (combining minimum weight with maximum strength) results in a damper of unsurpassed durability and versatility. Each damper easily adjusts to a minimum of three different sizes and includes a mid-torque motor that ensures reliable trouble free operation.

Retro Fit Dampers

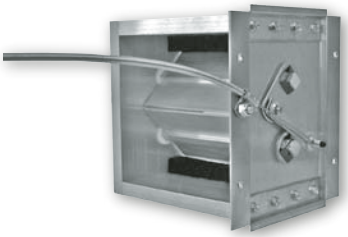
Spring Open/Power Closed
Retro Fit

Power Open/Power Closed
Retro Fit

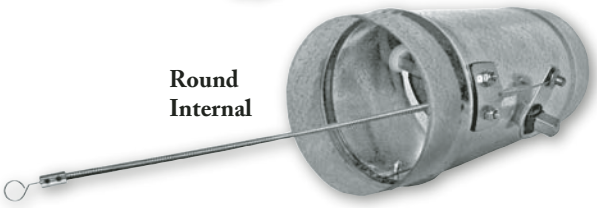
DuroZone Retro Fit Dampers can be used to add a zoning system to existing 6" round ductwork without the need to section, take down or redesign existing duct. Retro Fit Dampers feature a high strength molded mounting plate with gasketing as well as a blade with an integral seal to further minimize or eliminate leakage. DuroZone Retro Fit dampers are available with two different 24 volt motor options: Spring Open / Power Close and Power Open / Power Close. They can be linked together for tandem operation.

Cable Operated Dampers*

**Cable Operated Dampers are not to be used with DuroZone zone control systems.*



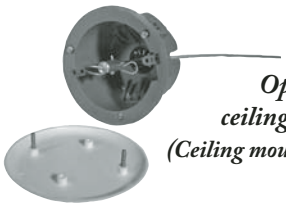
Rectangular External



Round Internal

Manually Controlled Cable Operated Dampers

Cable Operated Dampers (CODs) are the most convenient and economical way to balance air flow through the face of a diffuser. There are four styles of CODs (all installed upstream of the diffuser); round with a control cable to be routed internally through the duct, round with an external control cable, rectangular with a control cable to be routed internally through the duct, and rectangular with an external control cable. Internally routed cables pass through the neck of the diffuser and are accessed at its face. After adjustment, the protruding cable is stored in the diffuser. Externally routed cables are generally accessed in the ceiling. Adjustments are made by pushing or pulling the looped end of the control cable and then locking it in place with a set screw.



Optional wall or ceiling mount available.
(Ceiling mount and coverplate shown)

Thermostats

DT3

DT3 Thermostat

Digital Set Back Thermostat
5+1+1 programmable – Battery powered - 24 Volt powered
System settings: Cool – Off - Heat, Fan settings: On - Auto
Available terminals – RC, RH, W, Y, G, B, O, C
Use with control panels - SMZ, SMZ-AC, RED4

DT4

DT4 Thermostat

Digital Display Thermostat
Non-programmable – Battery powered - 24 Volt powered
System settings: Cool – Off - Heat, Fan settings: On - Auto
Available terminals – RC, RH, W, Y, G, B, O, C
Use with control panels - SMZ, SMZ-AC, RED4

DTAC

DTAC Thermostat

Universal Multi-Stage Auto Changeover Digital Set Back Thermostat
5+2 programmable – Battery powered - 24 Volt powered
System settings: Heat – Off – Cool – Emer - Auto, Fan settings: On - Auto
Available terminals – R, C, E/W1, W2, Y1, Y2, G, B, O, L
Use with control panels - SMZ, SMZ-AC, RED4, JTZ-HP

DT7

DT7 Thermostat

Heat Pump Digital Display Thermostat
System settings: Cool – Off – Heat - Emer, Fan settings: On - Auto
5+1+1 programmable – Battery powered - 24 Volt powered
Available terminals – R, C, E, W2, Y, G, B, O
Use with control panel - JTZ-HP, RED4 (Zone 1 only)

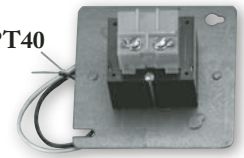
Thermostats (Continued)

DZOT

DZOT Thermostat

Outdoor thermostat
SPDT remote bulb thermostat for sensing temperature changes
Available terminals – R, W, B
Use where activation initiated by outdoor temperature change required

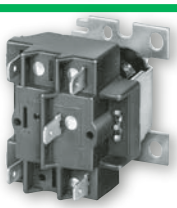
Accessories



PT40

PT40 Plate Mounted Transformer

The DuroZone PT40 Plate Mounted Transformer is a 120 volt input, 24 volt output, 40va rated step down transformer. The PT40 installs on a typical 4 x 4 electrical box and one transformer can operate up to 4 DuroZone dampers.



RR1

RR1 Relay

The DuroZone RR1 Relay is a 24 volt single pole, double throw, multi-purpose relay that is typically used for applications when isolation or protection of circuits is desired. When more than one relay is required, use DRP2 Universal Relay Pack (Page 7).

Special Controls

OTS

OTS Outdoor Temperature Sensor

For use with RED4 panels. The OTS is installed outdoors and out of direct sunlight. The OTS is used with dual fuel heat pump/gas furnace installations.

LAT

LAT Supply Air Temperature Sensor

For use with RED4 panels. The LAT is installed in the plenum or supply air duct after the evaporator coil. LAT helps protect equipment from freeze up or high limit lock out.

FPS

FPS Freeze Protection Sensor

The DuroZone FPS Freeze Protection Sensor is a low cost control designed to be put on the suction line outside the evaporator coil. At 38° it will break the circuit to the compressor relay (Y) preventing freeze-up. At 51° it will make the compressor relay (Y) continue the cooling cycle. The FPS can be used with any of the DuroZone control systems.

DS11

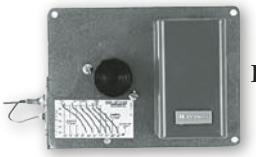
DS11 Remote Damper Switch

The DuroZone DS11 Remote Damper Switch is a wall mounted switch for manually opening and closing standard DuroZone dampers. Generally used in special applications for ventilation control, it installs in a standard 2 x 4 electrical switch box.

MPS4

MPS4 Multi-Position Switch (formally FAS-4)

The DuroZone MPS4 switch is a remote, wall-mounted switch for manual control of DuroZone 4 position dampers - models MPRD, MPMS and MPMB. Easy to install, this 4 position switch allows the dwelling occupant greater comfort and flexibility in controlling the volume of air entering into the space. Typically used for fresh air intake purposes, it installs in a standard 2 x 4 electrical switch box.



DZEC

DZEC Enthalpy Control

The DuroZone DZEC Enthalpy Control senses temperature and humidity and closes a set of contacts at a user determined level. The DZEC is typically used with the DuroZone EC-1 and EC-2 Economizer Panels.

Special Controls (Continued)

DDW

DDW Pressure Relief Damper Weight/Arm

The DuroZone DDW replacement arm & weight for DuroZone Pressure Relief Dampers can be used to add more weight to the Damper Arm for higher pressure settings.

DZDBF

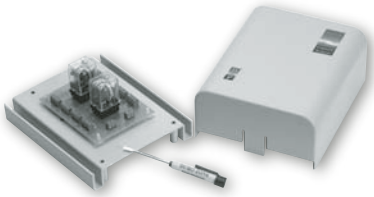
DZDBF Duct Board Damper Frames

The DuroZone DZDBF Duct Board Damper Frames allow easy mounting of standard DuroZone model MS and MB dampers into Duct Board without tools. It consists of two metal sleeves which clip onto the edge of a slot cut into the duct board.

TDT1

TDT1 Time Delay Timer

The DuroZone TDT1 Timer is a "delay on make" solid state device for energizing 2nd stage heating or cooling without the need of a 2 stage thermostat. The time setting is adjustable from 1 to 8 minutes. It operates with voltages from 19 to 240 AC.



DRP2

DRP2 Universal Relay Pack

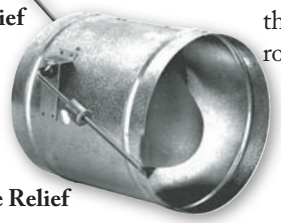
The DuroZone DRP2 Universal Relay Pack consists of two 24 volt 4PDT "plug-in relays mounted on a circuit board. The circuit board has convenient terminal strips to make wiring easy and it is mounted in a plastic enclosure for protection. The DRP2 can be used in a variety of situations and applications where two or more isolation relays are needed.

Pressure Relief Dampers

Rectangular and Round Pressure Relief Dampers

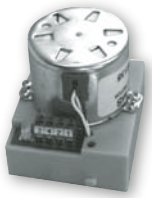
DuroZone Pressure Relief Dampers are used to relieve excess air pressure created when less than all the zones of a duct system are calling. They do this in a simple and reliable fashion based on barometric/static pressure in the duct system. When pressure builds up in the duct system due to satisfied zones, the pressure opens the damper blade and "bypasses" to an unconditioned area or back to the return air duct. The pressure relief damper closes when the system is off or when all the zones are calling. DuroZone Pressure Relief Dampers are available in both rectangular and round configurations.

Rectangular Pressure Relief



Round Pressure Relief

Replacement Motors



RM-RD/MS/MB

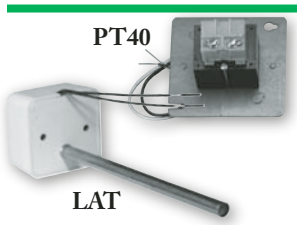
DuroZone has a wide variety of replacement motors for all the dampers it manufactures. Most are low voltage (24 volt) activated, but some are also available as 110 volt units (110 volt is spring return only).

Models such as spring return, power open/ power close, and high torque spring return are available. For help in determining your replacement motor needs, contact your Duro Dyne representative or the Duro Dyne Technical Support department.

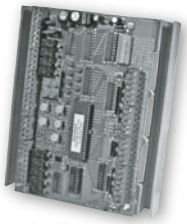
SRHTM024

MMSRO24

RED4 Zone System Panel Kits



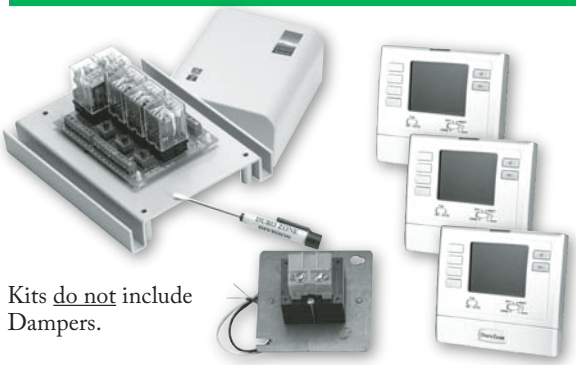
Kits do not include Dampers and Thermostats.



RED4

RED4 microprocessor zone control panels are suitable for all 2,3 and 4 zone applications. The panel is configurable and can be used for conventional heat-cool, heat pump, dual fuel heat pump, geothermal and even hydronic and oil systems. Kits include a 24 volt 40va transformer, a control panel, and a supply air temperature sensor. The RED4 is especially well suited for applications where building codes require fresh air intake.

JTZ and SMZ Zone System Packages



Kits do not include Dampers.

JTZ and SMZ Zone Control Packages provide, in one convenient box, all the controls necessary to install a 2 or 3 zone system. Each box contains a control panel, a 24 volt 40va transformer, and the necessary thermostats for each zone. JTZ and SMZ Zone Control Packages come in several configurations to address most two and three zone situations for both conventional Heating/Cooling Systems and for Heat Pumps.

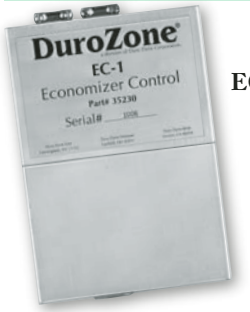
Indoor Air Quality and Economizers

AQC Air Quality Control Center

AQC

When tightly insulated homes have windows and doors shut, stale air is sealed in and fresh air is sealed out. Fresh air provides a healthier home and work environment. The key to eliminating moisture, bacteria, carbon monoxide and household odors is bringing fresh air indoors. The Dyna-Fresh Air Quality Control System brings outdoor air inside to make a more comfortable and healthy environment. The key component is a control panel which draws air into the home or workplace at pre-determined intervals with a 24 volt timer or manual override for continuous fresh air flow. The fresh air is drawn in through a motorized round damper. This fresh air is mixed with the indoor air already inside the heating / cooling system. The mixture is now circulated through the ductwork while stale air is vented out through an existing ventilation (such as a bathroom exhaust fan).

EC-1 Economizer Control



EC1

The EC-1 is used in conjunction with two DuroZone zone dampers and an enthalpy control to create an economizer package for an air-conditioning system. At rest, (outside conditions not conducive for cooling), the return air damper will be open, the fresh air damper will be closed, and the compressor will function normally. When correct enthalpy conditions are attained, (humidity and temperature conducive for cooling), the EC-1 will close the return air damper and open the fresh air damper. At the same time the compressor will shut down, but the fan will continue to run, drawing fresh air from outside to satisfy the cooling demand.

EC-2 Economizer Control

EC2

The EC-2 is used in conjunction with two DuroZone fresh air 4 position dampers and an enthalpy control to create an economizer package for an air-conditioning system. The EC-2 incorporates a 4 position rotary switch to allow mixing of the outside air with return air. At rest (humidity and temperature not conducive for cooling), the return air damper and fresh air damper will be in the position indicated on the switch and the compressor will function normally. When correct enthalpy conditions are attained, (outside conditions conducive for cooling), the return air damper and the fresh air damper will change positions. At the same time, the compressor will shut down, but the fan will continue to run, drawing fresh air from the outside to satisfy the cooling demand.

DuroZone

Planning and Installation

Designing a zone system for a new installation is slightly different than designing a zone system for a retrofit or existing structure. However, the guidelines are no more difficult to apply than those for existing duct layout and design. A little common sense and preparation will resolve most problems before they occur.

While zoning can offer considerable savings in energy and equipment function costs, the main goal in zoning a home or structure is to provide greater comfort to the home owner or occupants than is achieved through a single thermostat system. When designing a new system, the following considerations should be addressed.

What are the different areas of occupancy or usage? Establishing areas of load or occupancy allows the installer to focus on "ZONE" conditioning where people gather at different times of the day or night. For example: The living room, dining room, and kitchen are usually occupied during the day. The bedrooms are occupied in the evening. By establishing these distinct areas as two separate zones, this format not only allows for maximum comfort by matching areas of conditioning with structure occupancy, but it also establishes definite usage patterns effectively shutting down or lowering the demand for conditioning in areas of low occupancy resulting in energy savings. This format also maximizes the performance of setback thermostats.

Are there any areas that cause abnormal loads? Great rooms, glass walls, cathedral ceilings, hot tub enclosures, etc. - These features can put unusual strain on the comfort system. Be sure when creating your zones and sizing your equipment and duct work, you "have a handle on" the usage and loads created by such additions. Depending upon the application, it could be more beneficial to put in two smaller systems and zone them, instead of putting four or five zones on a larger system.

Design Considerations

DuroZone offers two distinct types of zone control panels:

Relay Based

The JTZ and the SMZ 2, 3, and 4 systems use a primary thermostat for Zone 1 that has a sub base that designates the mode of operation (Heating or Cooling). This thermostat also controls constant fan operation. These panels feature mechanical relay operation and have switches so you can determine whether a zone will or will not participate in constant fan mode. The SMZ is also available in a "first come, first served" auto-changeover design called SMZ-AC. The SMZ-AC is a three-zone system and is compatible with virtually any thermostat currently on the market.

Microprocessor Based

The RED4 is a microprocessor control panel which can be programmed by the installer for conventional heating / cooling, heat pump, dual fuel, geothermal, or hydronic systems. The panel is compatible with most low cost heat / cool thermostats as well as more expensive programmable and automatic changeover types. Other features of the RED4 panels are: an optional purge cycle, limiting second stage heating when only one zone is calling, fresh air intake, built in diagnostics, and much more.

DuroZone

"How do I size my Ductwork?"

This is probably the number one question asked of contractors when discussing zoning. There are no hard and fast rules regarding this. There is no magic formula that always works. What we can provide are some guidelines -"rules of thumb" and alert you to some common pitfalls.

The primary objective is to maintain constant airflow through the HVAC system when only one zone calls and still being able to provide sufficient airflow if all zones call.

On two and three zone systems, adequate airflow can be maintained by sizing the trunk line to each zone to be able to handle 60 to 70 % of the available cfm. If you then run five 6-inch takeoffs from these trunks, adequate airflow is maintained. Below is a simple chart to guide you for systems of 800 to 2000 cfm.

System CFM	Trunk Duct	Branch Duct
800	12 x 8 or 12" round	5 - 6" round
1000	14 x 8 or 12" round	5 - 6" round
1200	16 x 8 or 12" round	5 - 6" round
1400	18 x 8 or 14" round	5 - 7" round
1600	20 x 8 or 14" round	5 - 7" round
2000	22 x 8 or 16" round	5 - 8" round

When designed this way, a by-pass damper may not be necessary but it never hurts to have one. We recommend installing one even if it is only in anticipation of future alterations and/or for balancing purposes.

On systems of four or more zones the 60% rule will not work. For systems of this configuration lay out your duct work as if it was not zoned. Now, increase each trunk to handle 20% more of your designed cfm. For example, if you determine that Zone 1 would require 500 cfm under normal conditions, install a trunk duct capable of 600 cfm. Repeat this for each zone.

On systems of four zones or more a by-pass damper is almost always required. The by-pass damper should be sized to "dump" the difference between the total available cfm and the smallest zone.

The biggest pitfall in designing four or more zones is not keeping all the zones approximately the same size. Try to avoid having one zone of 100 cfm and another of 600 cfm. Also try to keep all zones within 20% to 30% of each other. If this is not possible, install adequate by-pass or consider splitting the system into two smaller zoned systems.

What do I do with by-passed air?

The by-passed air can be ducted into non-critical temperature areas such as entryways, basements, recreation rooms, cathedral ceilings, etc. Do not by-pass this air into attics or crawl spaces as this may cause a negative pressure situation and/or condensation in the house.

Ideally the air should be ducted back into the HVAC system through the return air. If this procedure is followed, the air should be ducted into the return duct as far from the air handler as possible to allow adequate mixing of the airstreams. If space does not allow this, controls such as an anti-freeze-up control (FRP) should be installed to protect the equipment.

Remote Control Dampers

WRCD Remote Control Damper

WRC Remote Control

Remote Control Damper (WRCD) and Wireless Remote Control

One piece of heating and cooling equipment often services more than just one room or office. Differences in both climatic exposure as well as personal needs can result in an uncomfortable environment for some occupants. No matter how well a system is designed and balanced, providing comfort to individuals is an unending task.

The model WRCD Damper uses a wireless remote control (WRC) to incrementally open and close a volume damper allowing the occupant total control over their comfort. It is a 24 volt powered damper that is designed to install between a lay-in diffuser and the supply duct for the purpose of regulating the volume of airflow into a specific space. Easily installed, the WRCD is designed to be a quick cure for areas where occupants require the ability to frequently adjust the airflow.

Diffuser Dampers

RCD Diffuser Damper

OSL Occupancy Sensor

MWC Manual Wall Control

Diffuser Damper (RCD) and Controls

Room or office occupancy can vary greatly as a result of meetings, travel or daily schedules. The DuroZone Diffuser Damper is an efficient way to condition the spaces that are used intermittently such as a conference room or an empty office. Utilizing the Diffuser Damper in these areas can minimize the waste of energy that results from conditioning unoccupied areas.

The DuroZone Diffuser Damper can be installed with either of two control options:

1) A Manual Wall Control (MWC) can be wired directly to the damper. The occupant can use the switch to incrementally adjust the damper setting.

2) An Occupancy Sensor (OSL) can be wired directly to the damper. As someone enters the space and turns on the lights, the sensor detects the lights being turned on and opens the damper to the pre-set occupied airflow setting. When the lights are turned off the sensor reacts and sets the damper to its minimum (vacant) setting.

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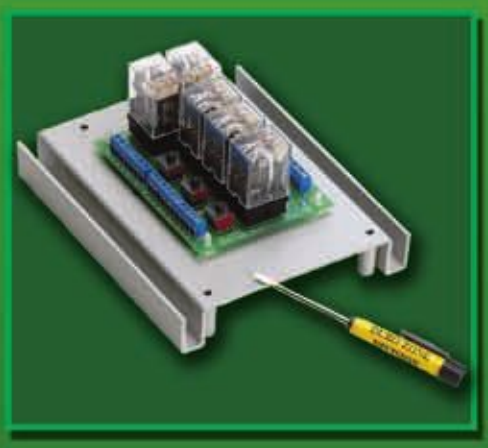
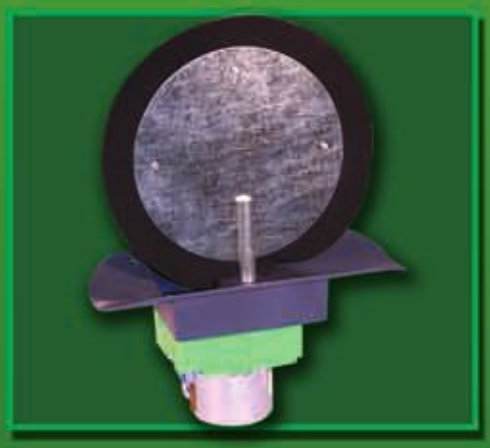
www.durodyne.com
for the most current product information.





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