

# CONTROL ZONE SOLUTIONS



**RUSKIN**<sup>®</sup>  
GO GREEN  GO RUSKIN

# RUSKIN ZONE CONTROL SYSTEMS HELPING YOU ACHIEVE LEED® CERTIFICATION THROUGH INDOOR ENVIRONMENTAL QUALITY (IEQ)

Ruskin Zone Control Systems improve the indoor air quality, ventilation and thermal comfort in commercial, institutional and high-rise buildings. This document applies to the

LEED® New Construction & Major Renovations  
LEED® Commercial Interiors  
LEED® Core & Shell  
LEED® Schools

LEED® Existing Buildings, Operations & Maintenance  
LEED® Healthcare  
LEED® Retail: Commercial Interiors



As you pursue your LEED Certification, rely on the products and expertise of Ruskin.

*LEED® Certification and the awarding of credits, is based on the overall project design, properly designed building systems and construction assemblies, and the performance of the project as a whole. Zone dampers and controls can be a component of many of these systems and assemblies, with all components within those systems and assemblies being considered in assessing compliance with the LEED® Rating System within a given category and credit. Ruskin Zone Control products contribute to the categories listed below.*

## IEQ PREREQUISITE 1 *Minimum IAQ Performance*

### PURPOSE

Minimum indoor air quality (IAQ) performance in buildings improves occupant comfort, well-being, and productivity compared with buildings with poor IAQ performance. Key strategies for maintaining minimum IAQ include limiting potential indoor contaminant sources, limiting the introduction of contaminants from potential outdoor sources, and most importantly, determining and maintaining at least the minimum zone outdoor airflow and the minimum outdoor air intake flow required by the ventilation rate procedure of ASHRAE Standard 62.1-2007.

### ENVIRONMENTAL ISSUES

Minimum IAQ performance will generally improve IAQ. Doing so, however, can require higher energy use to operate compliant HVAC systems compared with

systems that do not meet the ventilation guidelines of ASHRAE 62.1-2007. Compared with the personnel costs of the occupants, any premium associated with ensuring IAQ is insignificant. Poor IAQ can cause occupant illness, and the additional energy cost of ensuring IAQ may be offset by improved occupant productivity and lower absentee rates. The USGBC website (<http://www.usgbc.org>) provides links to recent studies on this issue.

### ECONOMIC ISSUES

Because ASHRAE 62.1-2007 is the required standard for ventilation design for many areas, no additional design effort or cost will be required to meet this prerequisite. Its successful implementation reduces potential liability regarding IAQ issues for architects, builders, owners, building operators, and occupants.

## IEQ CREDIT 2 *Increased Ventilation*

### PURPOSE

To provide additional outdoor air ventilation to improve indoor air quality (IAQ) and promote occupant comfort, well-being and productivity.

### REQUIREMENTS

#### **CASE 1: Mechanically Ventilated Spaces**

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates required by ASHRAE Standard

62.1-2007 as determined by IEQ Prerequisite 1: Minimum Indoor Air Quality Performance.

#### **CASE 2: Naturally Ventilated Spaces**

Design natural ventilation systems for occupied spaces to meet the recommendations set forth in the Carbon Trust "Good Practice Guide 237" (1998). Determine that natural ventilation is an effective strategy for the project by following the flow diagram process shown in the Chartered Institution of Building Services Engineers (CIBSE) Applications

## IEQ CREDIT 2 *Increased Ventilation* (Continued)

Manual 10: 2005, Natural Ventilation in Non-domestic Buildings.

For Natural Ventilation systems, the applicable LEED Rating systems, require additional compliance with

recommendations set forth by CIBSE manuals or use of macroscopic, multi-zone, analytic model to predict that room-by-room airflows will effectively naturally ventilate, defined as providing the minimum ventilation rates required by ASHRAE Standard 62.1-2007 Chapter 6 for at least 90% of occupied spaces.

## IEQ CREDIT 6.2 *Controllability of Systems — Thermal Comfort* (IEQc6 for Core & Shell Development and Retail: Commercial Interiors)

### PURPOSE

To provide a high level of thermal comfort system control by individual occupants or groups in multi-occupant spaces (e.g., classrooms or conference areas) and promote their productivity, comfort and well-being.

### REQUIREMENTS

Provide individual comfort controls for 50% (minimum) of the building occupants to enable adjustments (for workspaces only in Schools projects) to meet individual

needs and preferences. Operable windows may be used in lieu of controls for occupants located 20 feet inside and 10 feet to either side of the operable part of a window. The areas of operable window must meet the requirements of ASHRAE Standard 62.1-2007 paragraph 5.1 Natural Ventilation. Provide comfort system controls for all shared multi-occupant spaces to enable adjustments that meet group needs and preferences. Conditions for thermal comfort are described in ASHRAE Standard 55-2004 and include the primary factors of air temperature, radiant temperature, air speed and humidity.

## IEQ CREDIT 7.1 *Thermal Comfort — Design* (IEQc7 for Core & Shell Development and Healthcare)

### PURPOSE

To provide a comfortable thermal environment that promotes occupant productivity and well-being.

### REQUIREMENTS

Design heating, ventilating and air conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy (with errata but without addenda 1). Demonstrate design compliance in accordance with the Section 6.1.1 documentation.

### SCHOOLS ADDITIONAL REQUIREMENT

For natatoriums, demonstrate compliance with the "Typical Natatorium Design Conditions" defined in Chapter 4 (Places of Assembly) of the ASHRAE HVAC

Applications Handbook, 2003 edition (with errata but without addenda 1).

### CORE & SHELL ADDITIONAL REQUIREMENT

The core and shell base building mechanical system must allow for the tenant build-out to meet the requirements of this credit. Project teams that design their project for mechanical ventilation that do not purchase or install the mechanical system are not eligible to achieve this credit. See Appendix 1 — Default Occupancy Counts for occupancy count requirements and guidance.

### HEALTHCARE ADDITIONAL REQUIREMENT

In order to receive the single IEQc7 point, both Thermal Comfort Design and Thermal Comfort Verification must be achieved.

LEED®

100 base points; 6 possible points in Innovation in Design and 4 possible Regional Priority points

CERTIFIED 40 – 49 points SILVER 50 – 59 points GOLD 60 – 79 points PLATINUM 80 points and above

## QUICK REFERENCE CHART

	MODEL	DESCRIPTION	UNIT DEPTH	MAXIMUM VELOCITY (FPM)	FACTORY STANDARD CONTROLS
Z2000 SYSTEM SOLUTION	Z2000	Commercial Zone Control Panel System	2"	N/A	Z2000 Control Panel
	Z2000DAT	Discharge Air Temperature Sensor	7-3/8"	N/A	N/A
	Z2000RT	Zone Temperature Sensor	7/8"	N/A	N/A
	Z2000NS	Zone Night Setback Thermostat	7/8"	N/A	N/A
	ZBBD25	Round Galvanized Steel Zone Barometric Bypass Damper	Varies	2000	Counterweight
	ZDD25	Diffuser with Integrated Zone Damper	6-5/8"	665	Modulating Actuator with Logic Board, Duct Sensor, & Wall Thermostat
	ZDR25	Round Galvanized Zone Damper	Varies	2000	
	ZDS15	Rectangular Single-Blade Galvanized Steel Zone Damper	3"	2000	
	ZDS36	Rectangular Multi-Blade Galvanized Steel Zone Damper	5"	2000	
	ZEBD15	Rectangular Single-Blade Galvanized Steel Zone Electronic Bypass Damper	3"	2000	Modulating Actuator, Static Pressure Controller, Pressure Probe
	ZEBD36	Rectangular Multi-Blade Galvanized Steel Zone Electronic Bypass Damper	5"	2000	
	ZEBD25	Round Galvanized Steel Zone Electronic Bypass Damper	Varies	2000	
INDEPENDENT ZONE SOLUTIONS	ZPD15	Electronic Zone Pulse Damper	3"	2000	Modulating Actuator & RJ11 Connector
	ZPD25	Round Electronic Zone Pulse Damper	6"	2000	
	ZRC020	Hand-Held Remote Control for Use with ZPD15 and ZPD25 Zone Pulse Dampers	2"	N/A	RJ11 Cable
	ZCD35	Multiple Blade Cable Driven Zone Control Damper	5"	2000	3' Cable
	ZMDRS25	Round Cable Driven Zone Control Damper	6"	1500	
	CDRAMS	Round Control Damper with Integral Air Measuring Station	Varies	4000	Transducer
	ZCD36	Single Mode Temperature Control Square Damper (Cooling or Heating)	5"	2000	Floating Actuator & Wall Thermostat
	ZCDR25	Single Mode Temperature Control Round Damper (Cooling or Heating)	7"	2000	
	ZCDRVAV	Auto Change Over Round Zone Control Damper (Cooling and Heating)	7"	2000	Modulating Actuator, Wall thermostat, & Duct Sensor
	ZCDVAV	Auto Change Over Square Zone Control Damper (Cooling and Heating)	3-1/2"	2000	

# Z2000

## MODULATING ZONE COMFORT SYSTEM CONTROL PANEL



### Z2000 SYSTEM FEATURES

- Fully modulating zone damper or diffuser actuators.
- Control up to 20 zones per single HVAC unit
- Auto Heat/Cool changeover
- Works with Single Stage, Multi-stage or Heat pump systems
- No programming required
- Auxiliary heat and cool options for each zone
- Night setback option
- LED indicator lights reveal status of equipment and zones
- Fused inputs and outputs to protect the circuit
- All low voltage wiring
- 5 year Control Panel Warranty

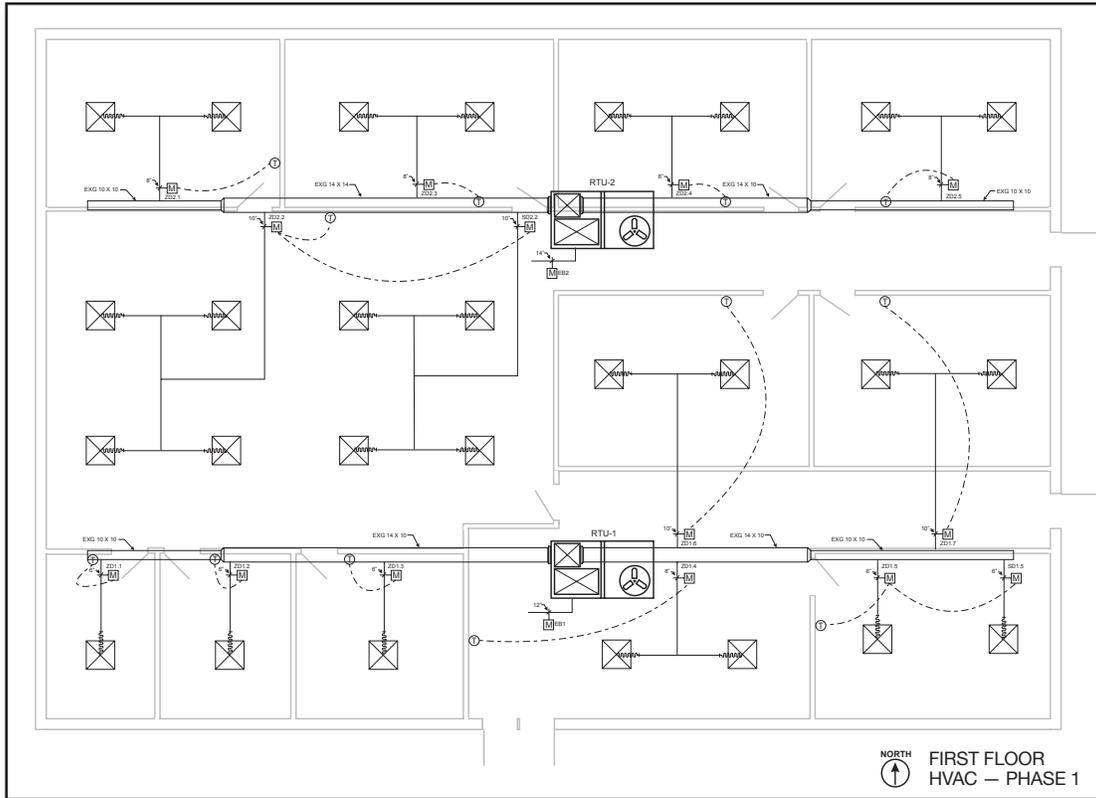
### Z2000 SYSTEM COMPONENTS

- Z2000 Control Panel
- Z2000DAT
- Z2000RT
- Z2000NS
- ZSPC800

### Z2000 SYSTEM DAMPERS

- ZBBD25
- ZDD25
- ZDR25
- ZDS15
- ZDS36
- ZEBD15
- ZEBD36
- ZEBD25

# Z2000 FLOORPLAN EXAMPLE



## RTU 1 ZONE CONTROL SYSTEM SCHEDULE

Panel: RTU1 (1) Z2000  
 Discharge Air Sensor: (1) Z2000DAS  
 Transformers: (1) 24VAC 74Va  
 (1) 24VAC 40Va  
 Bypass Damper: ZEBD25 12" DIA  
 Thermostats: (7) Z2000RT

ZONE DAMPERS	MASTER	SIZE	SLAVE	SIZE
ZD1.1	ZDR25	6" DIA		
ZD1.2	ZDR25	6" DIA		
ZD1.3	ZDR25	6" DIA		
ZD1.4	ZDR25	8" DIA		
ZD1.5	ZDR25	6" DIA	ZDR25	6" DIA
ZD1.6	ZDR25	10" DIA		
ZD1.7	ZDR25	10" DIA		

Options:  
 Scheduling: (1) Z2000NS

## RTU2 ZONE CONTROL SYSTEM SCHEDULE

Panel: RTU2 (1) Z2000  
 Discharge Air Sensor: (1) Z2000DAS  
 Transformers: (1) 24VAC 75Va  
 (1) 24VAC 40Va  
 Bypass Damper: ZEBD25 14" DIA  
 Thermostats: (5) Z2000RT

ZONE DAMPERS	MASTER	SIZE	SLAVE	SIZE
ZD1.1	ZDR25	8" DIA		
ZD1.2	ZDR25	10" DIA	ZDR25	10" DIA
ZD1.3	ZDR25	8" DIA		
ZD1.4	ZDR25	8" DIA		
ZD1.5	ZDR25	8" DIA		

Options:  
 Scheduling: (1) Z2000NS

## Z2000 SYSTEM MODELS



### CONTROL PANEL

#### Z2000

- Controls up to 20 zones
- Night setback option
- All low voltage wiring



### THERMOSTAT

#### Z2000RT

- P + I control
- Digital display
- Setpoint limits
- Fully modulating



### ROUND ZONE DAMPERS

#### ZDR25

- Sizes up to 36"
- Up to 2" of static pressure



### ZONE DAMPER DIFFUSERS

#### ZDD25

- 24" x 24" lay-in
- 12" x 12" lay-in
- 6" to 14" neck



### RECTANGULAR ZONE DAMPERS

#### ZDS15

- 8" x 8" to 26" x 12"

#### ZDS36

- Up to 36" x 24"
- Side mount
- Custom sizes available



### BAROMETRIC BYPASS DAMPERS

#### ZBBD25

- Sizes up to 16"
- Also available in rectangular



### ELECTRONIC BYPASS DAMPERS

#### ZEBD15

- 8" x 8" to 26" x 12"

#### ZEBD25

- Sizes up to 36"
- Up to 2" of static pressure

#### ZEBD36

- Up to 36" x 24" of static pressure

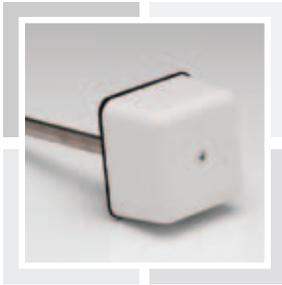
### WHY CONTRACTORS SHOULD SELL ZONE CONTROL

- Competitive edge
- High gross margins
- Increase profits
- Satisfied Customers

### BENEFITS TO THE CUSTOMER

- Improves overall temperature control
- Better control of individual areas
- Reduces energy bills
- Reduces installation costs
- Reduces maintenance costs

## Z2000 SYSTEM ACCESSORIES



**DISCHARGE AIR SENSOR**  
**Z2000DAS**

- Used for equipment staging



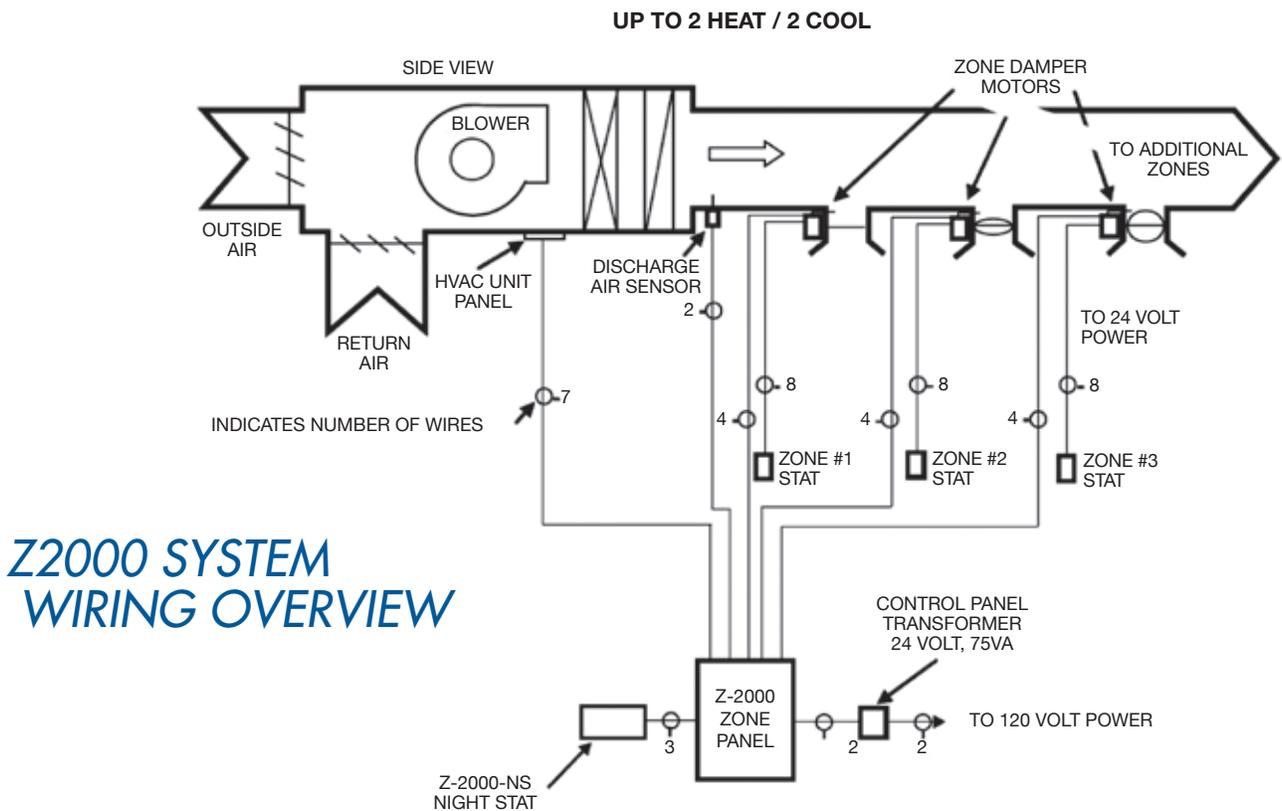
**NIGHT SETBACK**  
**Z2000NS**

- Occupied and Unoccupied zone temperature settings
- Setpoint limits

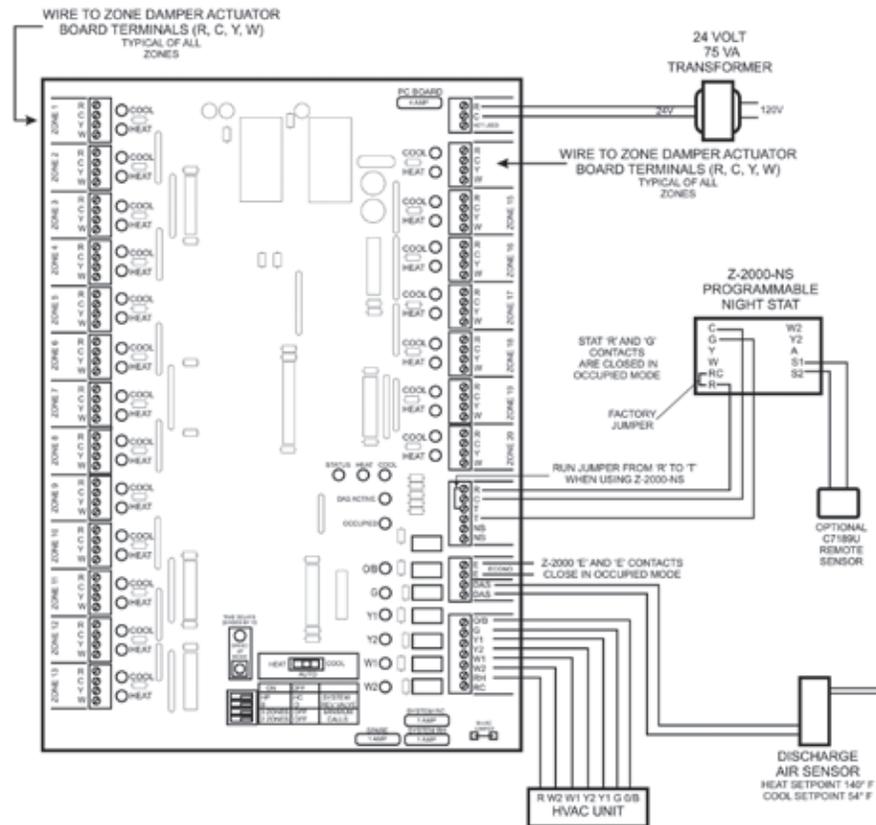


**STATIC PRESSURE**  
**CONTROLLER**

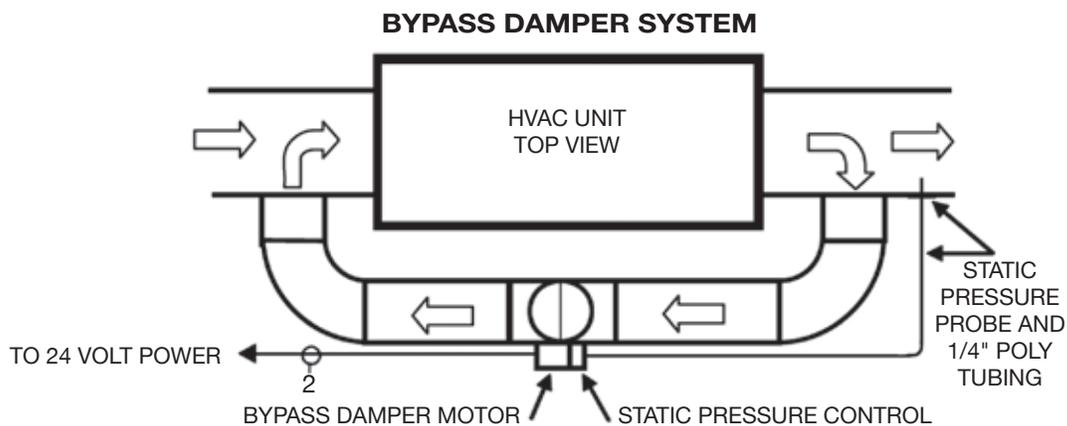
- ZSPC800**
- Used on the Electronic Bypass Dampers



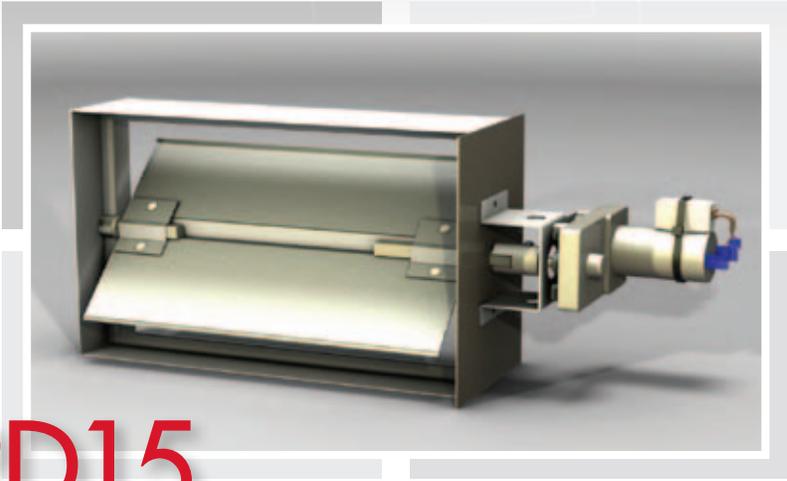
# Z2000 CONTROL PANEL WIRING DIAGRAM



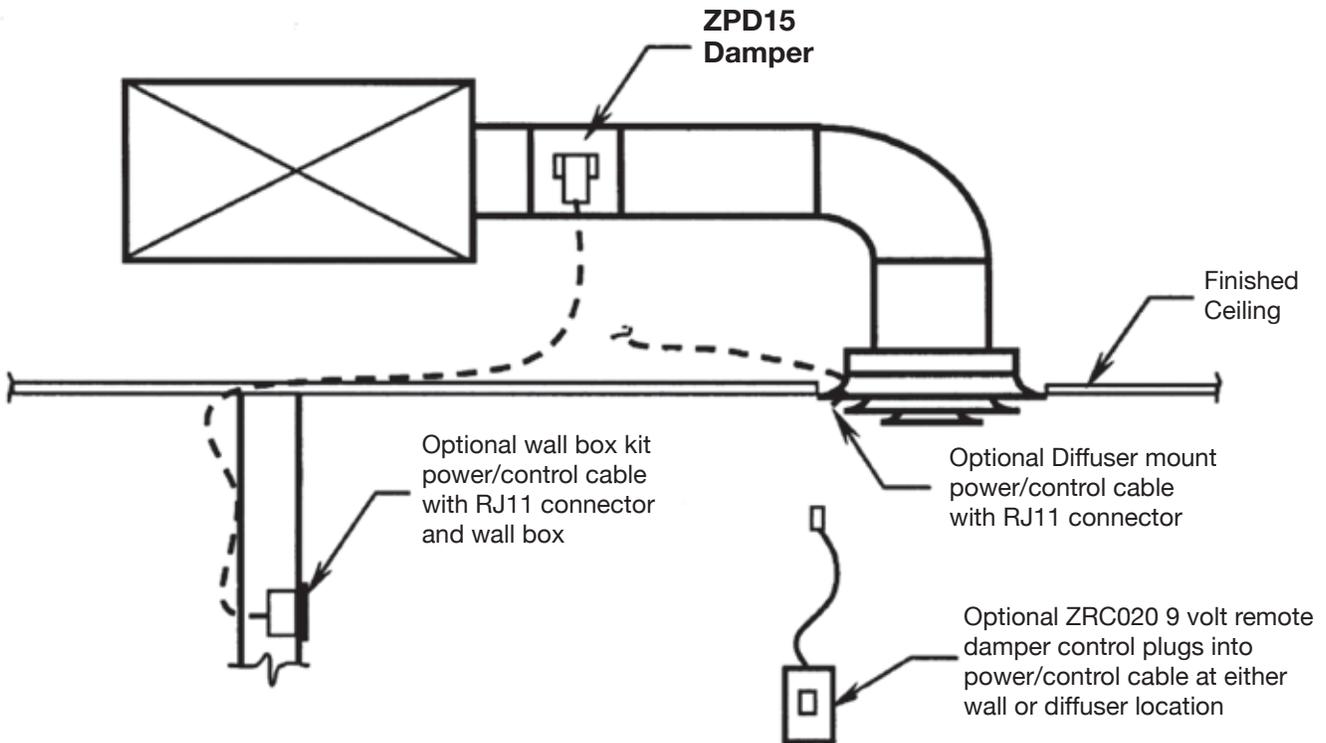
# Z2000 BYPASS SYSTEM OVERVIEW



# ZPD15



**Ruskin Model ZPD15** meets the industry requirements for a remote powered, manual balancing damper used in finished ceiling and difficult access applications. The ZPD15 offers an easily installed, maintenance free damper solution that interfaces with an optional hand-held damper motor control (model ZRC020). The hand-held device is equipped with an integral 9 volt power supply that operates the damper motor via optional RJ11 cable terminating at an RJ11 connector, located at the diffuser or wall box.



**Ruskin Model ZPD25** was developed to meet the industry requirements for a heavy duty, true round, and remote powered, manual balancing damper used in finished ceiling and difficult access applications. The ZPD25 offers an easily installed, maintenance free damper solution that interfaces with an optional hand-held damper motor control (model ZRC020). The hand-held device is equipped with an integral 9 volt power supply that operates the damper motor via optional RJ11 cable terminating at an RJ11 connector, located at the diffuser or wall box.



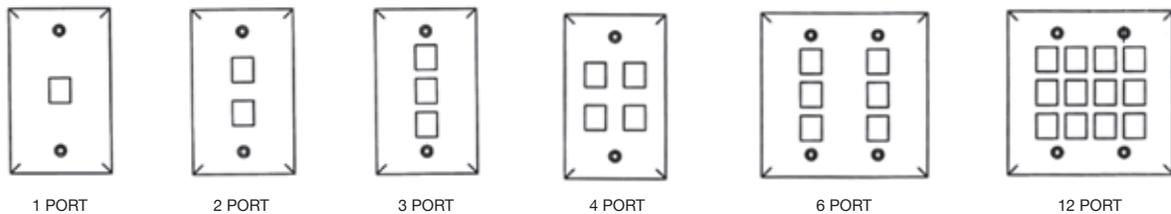
# ZPD25



# ZPD20

**Ruskin Model ZRC020** is a hand-held remote control that provides a 9 volt pulse signal to Ruskin electronic zone pulse dampers. The remote control device may be plugged into the optional diffuser cable or RJ11 wall box connector. This portable controller provides necessary power to adjust damper position while commissioning the building. The ZRC020's RJ11 connectivity provides a portable solution to the contractor. Only one controller is required at each job site since it is possible to easily move from one damper location to the next.

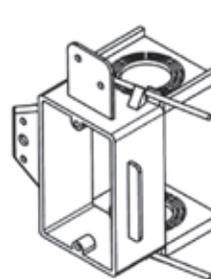
## WALL BOX (ZWBCP) VARIATION DETAILS



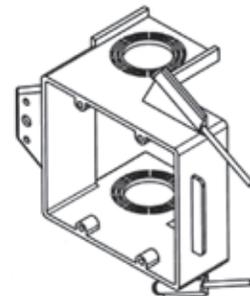
The following wall box kit variations are available. All kit variations come standard with appropriate wall box (single or dual gang) and 50' long plenum rate cable. Cable has RJ11 flush mount keystone connector to interface with cover plate on one end and male RJ11 connector to interface with the actuator port on the opposite end.

- Variation 1P — 1 Port cover with single gang wall box
- Variation 2P — 2 Port cover with single gang wall box
- Variation 3P — 3 Port cover with single gang wall box
- Variation 4P — 4 Port cover with single gang wall box
- Variation 6P — 6 Port cover with dual gang wall box
- Variation 12P — 12 Port cover with dual gang wall box

Notes:  
If special length plenum cable is required, contact Ruskin.



SINGLE GANG WALL BOX



DUAL GANG WALL BOX



## RUSKIN CABLE DRIVE BALANCING DAMPERS



# ZCD35

### AVAILABLE CABLE LENGTH

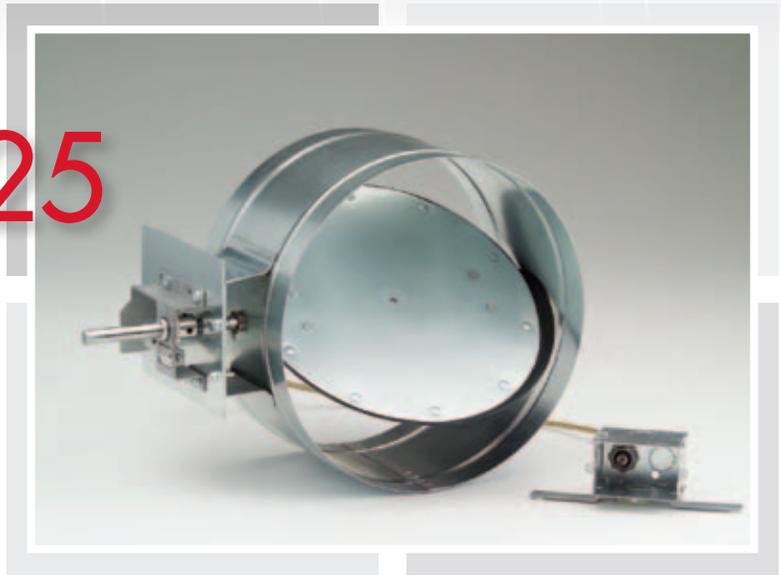
FT	MM
3	915
4	1229
5	1524
6	1829
8	2438
10	3048

**ZCD35 shown with wall mount and factory installed side plate and cable drive.**

**Ruskin Model ZCD35** is a ruggedly built zone control damper perfectly suited for installation in rectangular ducting. This model is a cable driven balancing damper and comes with a factory mounted side plate and 3 foot-long cable drive. The cable drive terminates in a square metal enclosure. The damper is designed to easily install into rectangular duct and becomes part of the ductwork.

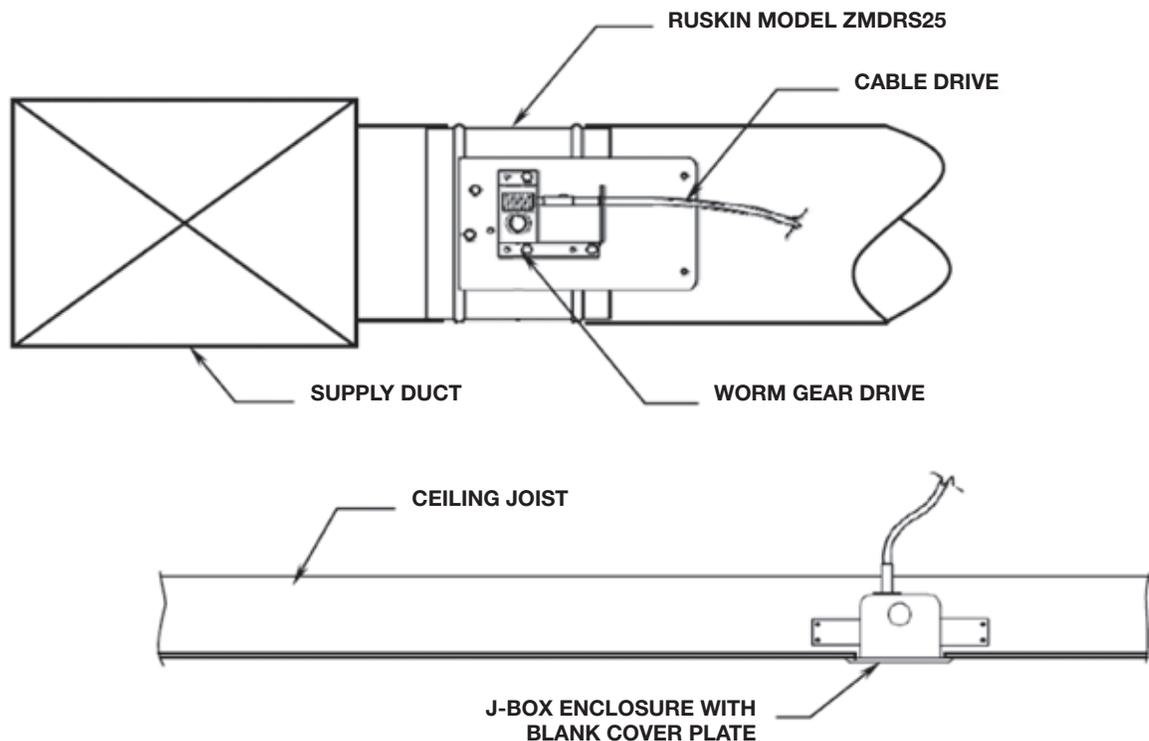
# ZMDRS25

**Ruskin Model ZMDRS25** is a ruggedly built zone control damper with factory mounted worm gear and three-foot long cable drive. The cable drive terminates in a square metal enclosure. The damper frame is designed to easily install into spiral duct and becomes part of the ductwork.



ZMDRS25 shown with wall mount and factory installed side plate and cable drive.

## ZMDRS25 CONCEALED CEILING MOUNT DETAIL



**Notes:**

1. Standard ZMDRS25 cable length is three feet. Additional lengths are available.
2. J-Box mounting is flush with the finished ceiling.

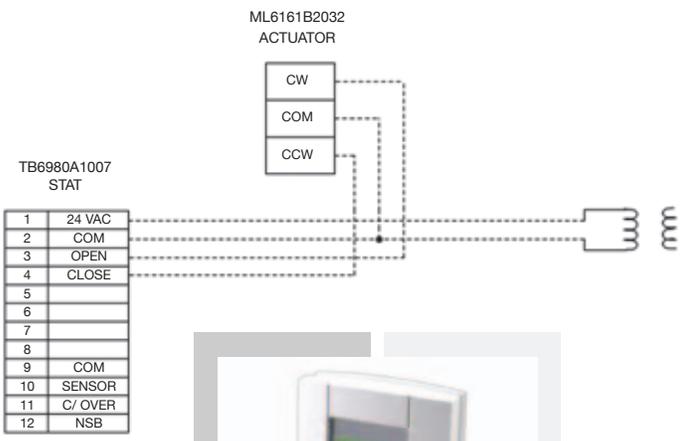


# ZCD36

**Ruskin Model ZCD36** is perfectly suited for installation in rectangular ducting. Complete with actuation, wall thermostat and side plate. ZCD36 is to be used for single mode applications only. For control of both heating and cooling modes refer to Ruskin Model ZCDVAV.

# ZCDR25

**Ruskin Model ZCDR25** can be installed into existing round ductwork. Complete with a floating actuator and field wired wall mounted thermostat giving individual control to office spaces with single or multiple branch ducting. For control of both heating and cooling modes refer to Ruskin Model ZCDRVAV.



## TB6980A THERMOSTAT FEATURES

- Provides floating control.
- Provides 2 additional outputs.
- Provides max. and min. setpoints for heating and cooling.
- Provides a night setback (NSB) terminal for energy savings.

## TB7980A THERMOSTAT FEATURES

- Provides modulating (2 to 10 Vdc analog) control.
- Provides 2 additional outputs.
- Provides max. and min. setpoints for heating and cooling.
- Provides a night setback (NSB) terminal for energy savings.

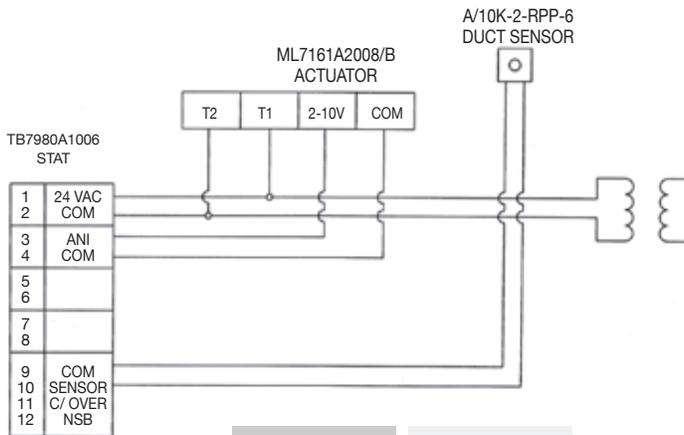


# ZCDVAV

**Ruskin Model ZCDVAV** is a rectangular zone control damper with automatic change over. The factory installed direct coupled modulating actuator, paired with a room and duct thermostat, evenly controls flow and heating to cooling change-over.

# ZCDRVAV

**Ruskin Model ZCDRVAV** is a round zone control damper with automatic change over. The factory installed direct coupled modulating actuator paired with a room and duct thermostat evenly controls flow and heating to cooling change-over.



## ML6161B AND ML7161A ACTUATOR FEATURES

Control for air damper applications with up to 10 sq. ft. assuming 3.5 in.-lb per sq. ft. of damper area, velocity independent.

Superior A/C synchronous submotor for consistent timing and actuator longevity.

Eliminate need for limit switches or mechanical stops by providing magnetic coupling.

Manual declutch lever and bag assembly with two minimum position setscrews.

Mount directly on 3/8 inch or 1/2 inch square or round damper shaft.

Selectable 45, 60, and 90 stroke in either clockwise or counterclockwise direction.





# RUSKIN®

**Air & Sound Control**  
*Specified by Many – Equaled by None*

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ZCB111 replaces ZCB 12/05

