SmartZone®

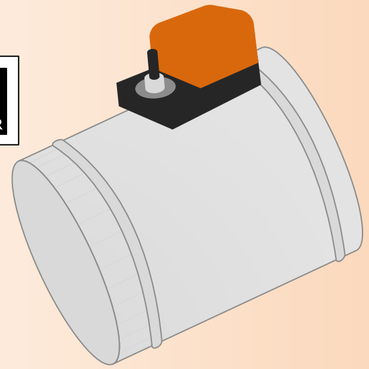
POWER OPEN/POWER CLOSE*

POWER DAMPERS POWER OPEN /POWER CLOSE DAMPERS USE THREE WIRES TO POWER THE DAMPER OPEN OR POWER IT CLOSED. THE ZONE PANEL IS RESPONSIBLE FOR SUPPLYING A 24VAC SIGNAL TO EITHER THE PO (POWER OPEN) OR PC (POWER CLOSED) TERMINAL OF THESE DAMPERS. PRIMARY ADVANTAGES OF POWER OPEN/POWER CLOSE DAMPERS INCLUDE LOWER POWER CONSUMPTION, QUIET OPERATION AND GREATER RELIABILITY. (2.5 TO 3VA)

ROUND

D	S	U	P	D
Damper	Supply	roUnd	Power	Diameter

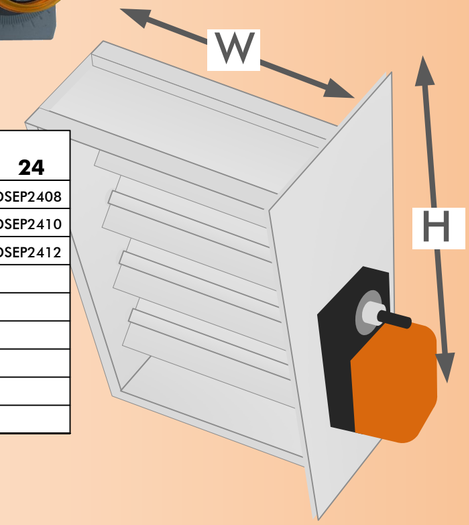
PART #	D
DSUP06	6″
DSUP07	7″
DSUP08	8″
DSUP09	9″
DSUP10	10″
DSUP12	12″
DSUP14	14″
DSUP16	16″
DSUP18	18″



RECTANGULAR

D	S	E	P	W	H
Damper	Supply	rEctangular	Power	Width	Height

HEIGHT (ACTUATOR MOUNTED)	WIDTH (INCHES) 08	10	12	14	16	18	20	22	24
08	DSEP0808	DSEP1008	DSEP1208	DSEP1408	DSEP1608	DSEP1808	DSEP2008	DSEP2208	DSEP2408
10	DSEP0810	DSEP1010	DSEP1210	DSEP1410	DSEP1610	DSEP1810	DSEP2010	DSEP2210	DSEP2410
12	DSEP0812	DSEP1012	DSEP1212	DSEP1412	DSEP1612	DSEP1812	DSEP2012	DSEP2212	DSEP2412
14	DSEP0814	DSEP1014	DSEP1214	DSEP1414	DSEP1614	DSEP1814	DSEP2014		
16	DSEP0816	DSEP1016	DSEP1216	DSEP1416	DSEP1616	DSEP1816			
18	DSEP0818	DSEP1018	DSEP1218	DSEP1418	DSEP1618				
20	DSEP0820	DSEP1020	DSEP1220	DSEP1420					
22	DSEP0822	DSEP1022	DSEP1222						
24	DSEP0824	DSEP1024	DSEP1224						

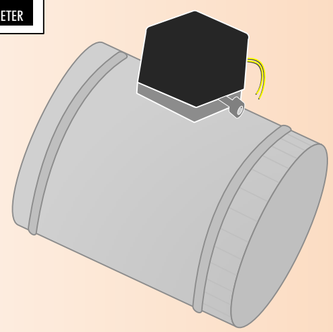


SPRING OPEN/POWER CLOSE*

SPRING DAMPERS USE A MOTOR TO POWER THE DAMPER BLADE IN ONE DIRECTION AND A SPRING TO MOVE THE BLADE IN THE OPPOSITE DIRECTION. WHEN POWER IS APPLIED TO THE DAMPER, THE MOTOR MOVES THE BLADE. WHEN POWER IS REMOVED, THE SPRING MOVES THE BLADE IN THE OPPOSITE DIRECTION. ***WARNING:*** *SPRING DAMPERS CONSUME MORE ELECTRICITY THAN POWER-OPEN/POWER-CLOSE DAMPERS. (10 TO 12 VA WHEN POWERED)*

D	S	U	S	D
Damper	Supply	roUnd	Spring	Diameter

PART #	D
DSUS06	6″
DSUS07	7″
DSUS08	8″
DSUS09	9″
DSUS10	10″
DSUS12	12″
DSUS14	14″
DSUS16	16″



SPRING MOTOR

A	S	D	M
Accessory	Spring	Damper	Motor

5 YEAR ECOJAY PRODUCTS LIMITED WARRANTY

POWER MOTOR

A	P	D	M
Accessory	Power	Damper	Motor

WIRING
USE 18-AWG SOLID WIRE TO CONNECT "COM", "PO" & "PC" TERMINALS TO ZONE CONTROLLER

CLUTCH
USE THIS BUTTON TO ROTATE THE BLADE & SHAFT OF THE DAMPER

SHAFT CLAMP
TO REMOVE MOTOR, LOOSEN TWO NUTS ATTACHED TO THE V-BOLT

MIN / MAX SETTING
MOVE SCREWS TO SET A MINIMUM OR MAXIMUM OPEN OR CLOSE OF THE DAMPER

DAMPERS & DUCT SYSTEM

A ZONING SYSTEM CAN TYPICALLY USE THE SAME DUCT SIZING AS A TRADITIONAL SINGLE-THERMOSTAT SYSTEM. IT IS IMPORTANT TO PROPERLY SIZE AND INSTALL A PRESSURE RELIEF AS WELL AS PROPERLY BALANCE THE ZONES. TO MINIMIZE BYPASS AIR FLOW, INCREASE THE DUCT CAPACITY BY ONE SIZE FOR EACH ZONE LESS THAN 25% OF THE TOTAL SYSTEM AIR FLOW CAPACITY. FOR SYSTEMS WITH MORE THAN 4 ZONES, INCREASING THE DUCT & DAMPER SIZES OF THE SMALLER ZONES (OR ALL THE ZONES) WILL MINIMIZE THE AMOUNT OF PRESSURE RELIEF NEEDED WHEN ONLY THE SMALLEST ZONE IS OPEN. ***NOTE:*** *CONNECT DAMPERS DIRECTLY TO THE PLENUM WHEN POSSIBLE AND BRANCH OFF SMALLER DUCTS GOING TO DIFFERENT AREAS WITHIN THE ZONES. USING THIS TRUNK/BRANCH DUCT DESIGN WILL MINIMIZE COST AND REDUCE AIR NOISE.*

ECOJAY DAMPERS ARE AVAILABLE IN OVER 100 DIFFERENT SIZES, SHAPES AND STYLES

ECOJAY'S 24VAC AIR DAMPERS ARE DESIGNED AND PRECISION BUILT FOR LONG TERM RELIABILITY. THE GASKET INSURES A TIGHT AIR SEAL WHEN CLOSED AND ALLOWS UNOBSTRUCTED AIR FLOW WHEN OPEN. ECOJAY DAMPERS USE HEAVY GAUGE GALVANIZED STEEL RIBBED CAN & ALUMINUM RECTANGULAR CONSTRUCTION INSURING LONG-LIFE AND STRUCTURAL INTEGRITY UNDER HARSH OPERATING CONDITIONS. FLEXIBILITY FOR A WIDE RANGE OF APPLICATIONS.

ZONE BALANCING

TO MAINTAIN OPTIMAL EQUIPMENT PERFORMANCE IN A TYPICAL ZONING APPLICATION, IT IS PREFERABLE FOR ALL ZONES TO BE CLOSE TO EQUAL IN SIZE. (IN TERMS OF CFM). THIS DOES NOT MEAN THAT EVERY ZONE MUST HAVE EXACTLY THE SAME CFM REQUIREMENTS BUT THE SYSTEM WILL WORK MOST EFFICIENTLY IF THEY ARE APPROXIMATELY THE SAME SIZE. FOLLOWING THIS GUIDELINE WILL MINIMIZE THE AMOUNT OF PRESSURE RELIEF (BYPASS) NECESSARY. ***NOTE:*** *AVOID CREATING MORE THAN THREE ZONES WITH OR ZONES SMALLER THAN 20% OF THE TOTAL EQUIPMENT CFM CAPACITY WHEN USING SINGLE SPEED EQUIPMENT TO ENSURE BEST PERFORMANCE.*

AIR NOISE

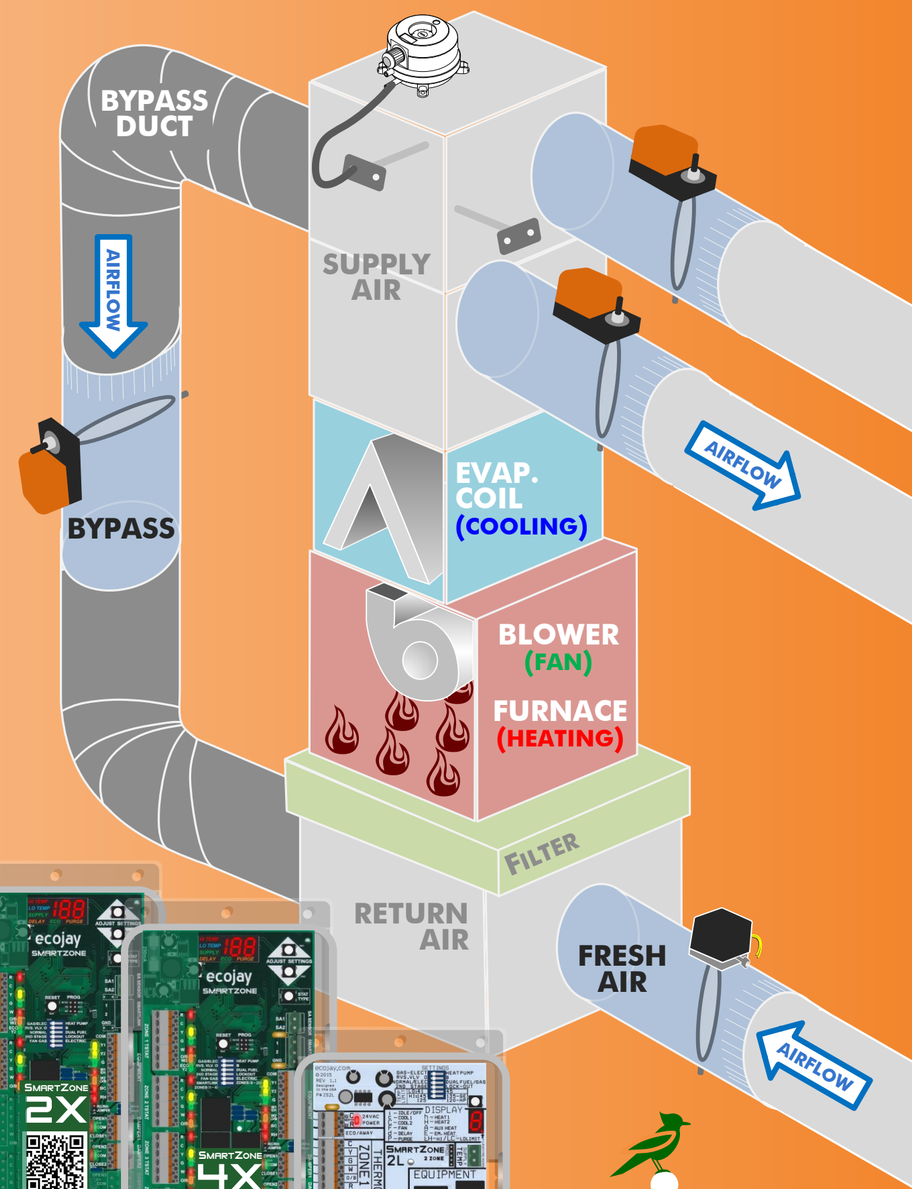
TO MINIMIZE AIR NOISE, INSTALL THE DAMPERS AS CLOSE AS POSSIBLE TO THE SUPPLY PLENUM. A GOOD RULE FOR ACCEPTABLE AIR NOISE IS THAT THE SUPPLY DUCT SHOULD BE DESIGNED TO PROVIDE 600 TO 700 FPM VELOCITY AIRFLOW. USE THE "NORMAL CFM" CHART TO CHECK ROUND DUCT SIZE(S) THAT WILL ACHIEVE THIS VELOCITY RANGE.
►FOR ZONES WITH MULTIPLE DAMPERS, THE TOTAL ZONE CFM IS THE SUM OF ALL THE DAMPERS "NORMAL CFM"
►FOR RECTANGULAR DUCT SYSTEMS USE THE RECTANGULAR CFM EQUATION PROVIDED FOR "NORMAL CFM"
(FORMULAS & CHARTS ON BACK)

RETURN AIR

UNDERSIZED RETURN AIR DUCTS/ REGISTERS CAN RESULT IN PROBLEMS DUE TO INSUFFICIENT AIRFLOW (CFM & VELOCITY) SUCH AS INCREASED RUN TIME, EVEN EQUIPMENT FAILURE. TO ENSURE THE RETURN AIR IS LARGE ENOUGH, VERIFY THAT ITS SURFACE AREA IS SUFFICIENT TO PASS FULL SPEED BLOWER CFM. ENSURE ALL ZONES HAVE UNRESTRICTED AIRFLOW PATH TO A RETURN AIR GRILL EQUIVALENT TO THE ZONE CFM.

BYPASS AIR

SEE INSIDE PAGE FOR INFO ABOUT BYPASS AIR AND PRESSURE RELIEF



CONTROL WITH
SmartZone®
2-ZONE – **ZS2X &2L**
4-ZONE – **ZS4X**
(UP TO 20 ZONES)

ecojay .com
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BYPASS SIZING, INSTALL & SETUP

A BYPASS SYSTEM CONSISTS OF A SHORT DUCT CONNECTING THE SUPPLY PLENUM TO THE RETURN AIR PLENUM. A "BYPASS" DAMPER IS INSTALLED IN THIS DUCT THAT OPENS/CLOSES AUTOMATICALLY TO MAINTAIN CONSTANT PRESSURE INSIDE THE SUPPLY AIR DUCT WHEN ZONES OPEN AND CLOSE. WHEN THE CORRECT SIZE BYPASS DAMPER IS INSTALLED AND ADJUSTED PROPERLY, IT WILL BE FULLY CLOSED WHEN ALL ZONES ARE CALLING (NO AIR BYPASSING) AND WILL OPEN PROPORTIONATELY AS ZONE DAMPERS CLOSE.

BYPASS SIZING

RULE OF THUMB:

*BELOW CHART ASSUMES 400 CFM PER TON *USE NEXT SIZE UP ROUND BYPASS DAMPER FOR ANY SYSTEM WITH A SINGLE ZONE LESS THAN 200 CFM.*

UNIT SIZE (TONS)	BYPASS DAMPER*
2 -2.5	08 -10"
3 -3.5	12"
4 -4.5	14"
5 -6	14 -16"

SIZING FORMULA:

MORE ACCURATE DETERMINATION OF THE SIZE BYPASS DAMPER NEEDED. NOTE: ALWAYS MEASURE THE AIRFLOW AFTER CORRECT CONFIGURATION TO ENSURE PROPERLY SIZED BYPASS DAMPER.

EQUIPMENT MAXIMUM AIRFLOW CAPACITY **(CFM)**

\- SMALLEST ZONE AIRFLOW CAPACITY **(CFM)**

= AIRFLOW CAPACITY NEEDED TO BYPASS **(CFM)**

EQUIPMENT

CFM	TON
800	2
1200	3
1600	4
2000	5

SMALLEST ZONE

ROUND DAMPER	NORMAL (CFM)
6"	100
7"	150
8"	200
9"	300
10"	400
12"	600
14"	900
16"	1400

BYPASS SIZE NEEDED

BYPASS (CFM)	ROUND BYPASS DAMPER
251 - 300	8"
301 - 450	9"
451 - 600	10"
601 - 900	12"
901 - 1400	14"
1401 - 2000	16"

NOTE: USE BELOW FORMULAS FOR RECTANGULAR BYPASS & DUCT SYSTEMS

RECTANGULAR BYPASS
NOTE: *SURFACE AREA IN SQ. FT. =* ("HEIGHT" X "WIDTH") / 144

SMALLEST ZONE CFM = (SURFACE AREA IN SQ. FT.*) X 600 FPM

BYPASS CFM = (SURFACE AREA IN SQ. FT.*) X 900 FPM

2015-07-19 – VERSION 1.4
888-523-3265
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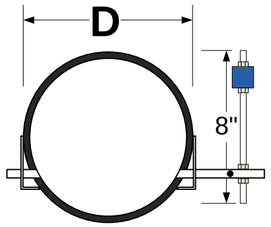
BAROMETRIC BYPASS

THE ECOJAY BAROMETRIC BYPASS DAMPER WAS DEVELOPED WITH ECONOMY AND SIMPLICITY IN MIND. THE NEED FOR A BYPASS DAMPER IN MOST ZONING APPLICATIONS CALLS FOR AN EASY TO USE AND COST EFFECTIVE DAMPER TO SERVE THIS PURPOSE. THE "WEIGHTED ARM" BYPASS METHOD OF RELIEVING AIR PRESSURE HAS PROVEN RELIABILITY AND QUIET OPERATION. CUSTOM COMPONENTS WITH CRITICAL DIMENSIONS ARE MANUFACTURED USING LASER CUTTERS TO ENSURE A PRECISION FIT. ASSEMBLED BY HAND IN THE USA.

D B U B D — Damper Bypass roUnd Barometric Diameter

PART #	DIAMETER
DBUB08	8"
DBUB10	10"
DBUB12	12"
DBUB14	14"
DBUB16	16"
DBUB18	18"

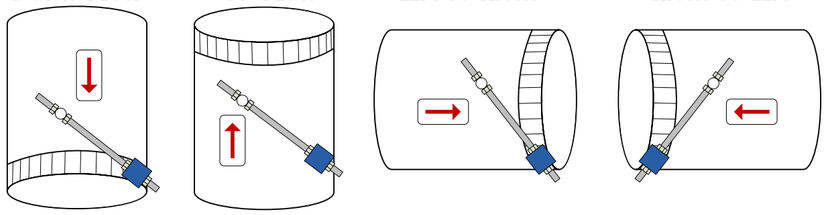


SPECIFICATIONS

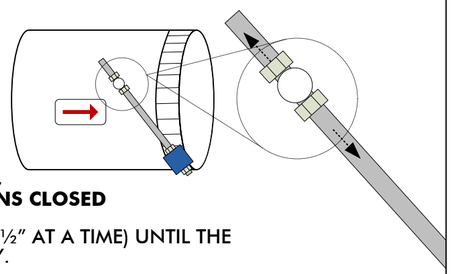
PRESSURE RANGE	0.1 TO 2 INCHES-H²0
WEIGHTED ARM	3/8" FULL THREADED 8" LENGTH
SHAFT	1/2" ALL METAL SHAFT PARTS TENSION-FIT RE-ENFORCED L-BRACKET
WEIGHT	~9 OZ
CAN	GALVANIZED, RIVETED, CRIMPED
BLADE	METAL W/'SANDWICHED' FOAM SEAL
INDICATOR	AIR-FLOW ► DIRECTION STICKER

CONFIGURATION

1. WITH BLADE CLOSED, POSITION THE "WEIGHT ARM" IN THE INITIAL POSITION SHOWN BASED ON AIRFLOW DIRECTION



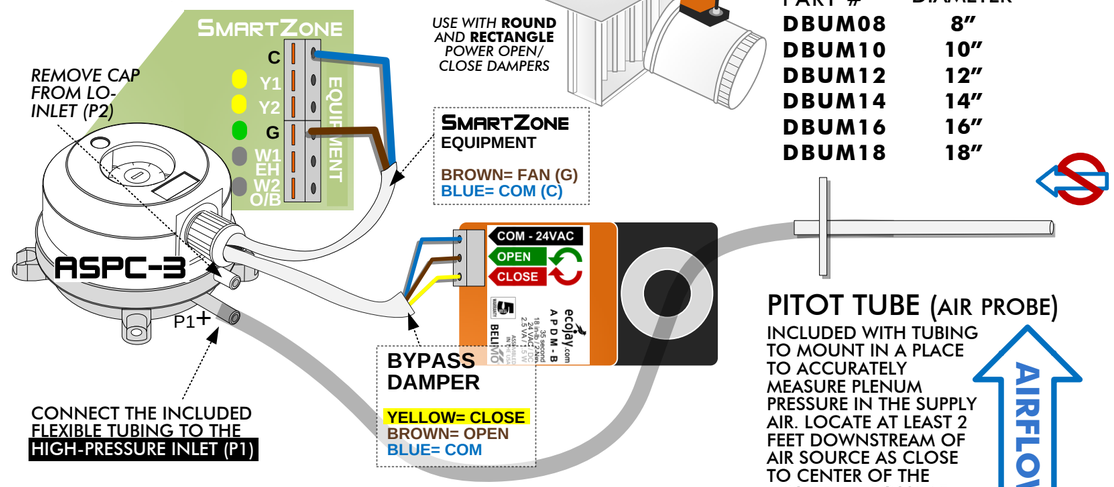
2. LOOSEN HEX NUTS ON THE WEIGHT ARM FROM THE DAMPER AT THE SHAFT AND SLIDE THE WEIGHT ARM THROUGH THE SHAFT HOLE



3. MAKE A CALL FOR COOLING FROM ALL ZONES & VERIFY THAT ALL ZONE DAMPERS ARE OPEN AND HI SPEED FAN IS RUNNING, **MAKE SURE THE BYPASS DAMPER REMAINS CLOSED**
4. MOVE THE WEIGHT TOWARD THE SHAFT (~½" AT A TIME) UNTIL THE BYPASS DAMPER STARTS TO OPEN SLIGHTLY.
5. MOVE THE WEIGHT AWAY FROM THE SHAFT ~¼" OR UNTIL THE BYPASS DAMPER REMAINS CLOSED WITH ALL ZONES OPEN & TIGHTEN HEX NUTS AROUND SHAFT
6. REMOVE THE COOLING CALLS FROM ALL BUT THE SMALLEST ZONE. AFTER DAMPERS FROM ALL BUT THE SMALLEST ZONE HAVE FULLY CLOSED, CONFIRM THAT THE BAROMETRIC BYPASS DAMPER OPENS EASILY. (NOTE: BYPASS WILL NOT FULLY OPEN)

MODULATING BYPASS

STATIC PRESSURE CONTROLLED BYPASS
FOR SUPERIOR AIR NOISE REDUCTION AND PRECISION AIR PRESSURE RELIEF, CHOOSE THE MODULATING BYPASS



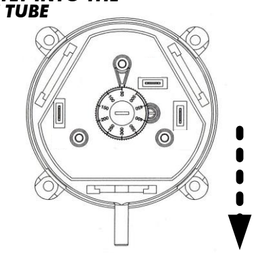
D B U M D — Damper Bypass roUnd Modulating Diameter

PART #	DIAMETER
DBUM08	8"
DBUM10	10"
DBUM12	12"
DBUM14	14"
DBUM16	16"
DBUM18	18"

PITOT TUBE (AIR PROBE)

INCLUDED WITH TUBING TO MOUNT IN A PLACE TO ACCURATELY MEASURE PLENUM PRESSURE IN THE SUPPLY AIR. LOCATE AT LEAST 2 FEET DOWNSTREAM OF AIR SOURCE AS CLOSE TO CENTER OF THE AIRSTREAM POSSIBLE
DO NOT ALLOW SUPPLY AIR PRESSURE TO BLOW DIRECTLY INTO THE PITOT TUBE

AIRFLOW



*MOUNT ASPC-2 WITH THE SAMPLE LINE CONNECTIONS IN THE "**DOWN**" POSITION. USE SCREWS & STANDOFFS THROUGH AT LEAST TWO OF THE FOUR MOUNTING FEET HOLES.*

CONFIGURATION

THE GOAL IS TO CALIBRATE THE BYPASS DAMPER TO OPEN IF SUPPLY DAMPERS CLOSE AND THE PLENUM PRESSURE INCREASES. FOLLOW THE STEPS BELOW.

1. MAKE A CALL FROM ALL ZONES FOR COOLING SO ALL ZONE DAMPERS ARE FULLY OPEN AND THE EQUIPMENT FAN (BLOWER) IS RUNNING AT THE HIGHEST SPEED.
2. TURN KNOB CLOCKWISE SLOWLY UNTIL THE BYPASS DAMPER MOTOR STARTS CLOSING IF DAMPER STARTS OPENING AGAIN BEFORE FULLY CLOSING, TURN THE KNOB CLOCKWISE SLOWLY UNTIL IT STARTS CLOSING AGAIN. REPEAT THIS PROCESS UNTIL THE DAMPER IS FULLY CLOSED. *(RED LED WILL BE ON)*
3. VERY SLOWLY TURN THE KNOB COUNTER-CLOCKWISE UNTIL THE BYPASS DAMPER MOTOR STARTS TO OPEN. *(RED LED WILL GO OFF & GREEN ON)*
4. AS SOON AS THE MOTOR STARTS TO RUN OPEN, TURN THE KNOB BACK CLOCKWISE JUST ENOUGH THAT THE DAMPER MOTOR STAYS CLOSED. *(RED LED WILL BE ON)*

TESTING

MAKE A CALL ONLY FROM THE SMALLEST ZONE FOR COOLING WITH THE FAN AT THE HIGHEST SPEED AND THE BYPASS DAMPER SHOULD MODULATE TO AN OPEN POSITION WITHIN 1 TO 2 MINUTES & AIR NOISE SHOULD BE ACCEPTABLY LOW.

SPECIFICATIONS

SET POINT RANGE	0.08" W.C. TO 0.80" W.C. (20 TO 200 PA)
PRESSURE CONNECTIONS	P1 (+) HIGH PRESSURE P2 (-) LOW PRESSURE
SWITCHING DIFFERENTIAL	5PA (0.02" W.C.)
MAXIMUM PRESSURE	10KPA
OPERATING TEMPERATURE	-4 °F TO +140 °F
ELECTRICAL RATING	1.0 A MAX
ELECTRICAL CONNECTIONS	1 NO – NORMALLY OPEN 2 NC – NORMALLY CLOSED 3 COM – POWER SUPPLY
CONDUIT CONNECTION	½" NPT THREADED
SAMPLE LINE CONNECTIONS	¼" ID TUBING

SMARTZONE®

5 YEAR ECOJAY PRODUCTS LIMITED WARRANTY

ecojay

ZONING CHECKLIST

SMARTZONE & THERMOSTATS

- ❑ CALCULATE MINIMUM 24VAC TRANSFORMER VA CAPACITY (SMARTZONE INSTALL GUIDE)
- ❑ CHECK PRIMARY AND SECONDARY VOLTAGE FOR ZONING TRANSFORMER *MAKE SURE SEPARATE TRANSFORMER AND CIRCUIT IS USED (DO NOT USE EQUIPMENT TRANSFORMER)
- ❑ SELECT MOUNTING LOCATION THAT PROVIDES SPACE AND EASY PATH TO RUN WIRES
- ❑ MOUNT THERMOSTATS WHERE NOT EXPOSED DIRECTLY TO AIR STREAM FROM SUPPLY AIR GRILLS, RADIANT HEAT FROM WINDOWS OR SKYLIGHTS, OR TOO CLOSE TO RETURN AIR
- ❑ USE THERMOSTATS THAT ARE NOT 'POWER STEALING' OR TRIAC BASED
- ❑ GAS/ELECTRIC OR HEAT PUMP STATS CAN BE USED ON HEAT PUMP EQUIPMENT (HEAT PUMP STAT IS REQUIRED ON ZONE 1 ONLY IF EMERGENCY HEAT CONTROL IS NEEDED) *NOTE: USE ONLY GAS/ ELECTRIC STATS WITH GAS/ELECTRIC EQUIPMENT*

DUCT & DAMPERS

- ❑ DESIGN ALL ZONES TO BE SIMILAR IN CFM CAPACITY AS MUCH AS POSSIBLE (BALANCED ZONES = LESS PRESSURE RELIEF NEEDED)
- ❑ AVOID CREATING SMALL ZONES (< 20% OF TOTAL CAPACITY)
- ❑ PROVIDE SUPPLY AIR DUCT PRESSURE RELIEF (SURPLUS AIR-FLOW MANAGEMENT) USING THESE TECHNIQUES –BYPASS DUCT/ DAMPER, DUMP ZONE(S) OR SET MAX CLOSE ON DAMPER TO ALLOW LEAKAGE
- ❑ ECOJAY RECOMMENDS THE USE OF A BYPASS DUCT/DAMPER THAT IS LARGE ENOUGH TO ACCOMMODATE THE TOTAL SYSTEM CFM CAPACITY MINUS THE CFM CAPACITY OF THE SMALLEST ZONE AND THE CFM PROVIDED BY ANY ADDITIONAL PRESSURE RELIEF
- ❑ REFER TO THIS ENTIRE DOCUMENT. MORE ONLINE AT ECOJAY.COM

HVAC EQUIPMENT

- ❑ PERFORM BASIC EQUIPMENT CHECK INCLUDING COMPRESSOR, REFRIGERANT CHARGE, BLOWER, FURNACE, FILTER BEFORE INSTALLING OR STARTING UP SMARTZONE SYSTEM.