

# DAMPERS

ALL ECOJAY SMARTZONE DAMPERS ARE CONTRACTOR GRADE, SUPER-DUTY QUALITY. MADE IN THE USA WITH ONLY THE BEST PARTS AND MATERIALS, THEY ARE BUILT TO WORK PROPERLY AND RELIABLY FOR A LONG TIME!



## ROUND

**DIAMETER:**  
4" TO 18"

**PART #**  
**D S U P D**  
DAMPER SUPPLY ROUND POWER DIAMETER

## POWER OPEN / CLOSE

A 24VAC SIGNAL TO EITHER THE PO (POWER OPEN) OR PC (POWER CLOSED) TERMINAL WILL RESPECTIVELY OPEN AND CLOSE THE DAMPER. LOWER (2.5 TO 3VA) POWER CONSUMPTION, QUIET OPERATION & HIGHEST RELIABILITY. 3 WIRES REQUIRED

## POWER MOTOR ONLY



**A P D M**

## RECTANGLE

**SIZES:**  
6" X 6" TO 24" X 24"

**PART #**  
**D S E P W H**  
DAMPER SUPPLY RECTANGLE POWER WIDTH HEIGHT



## TAKE-OFF

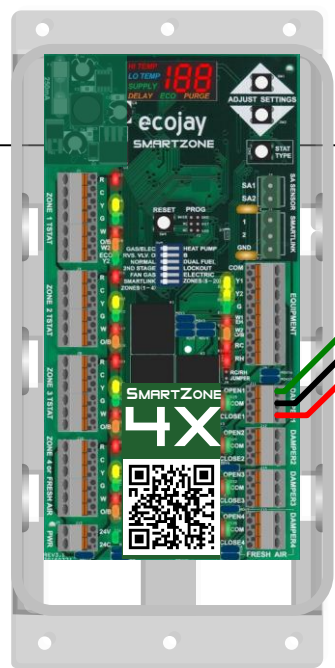
**D T U P D**  
DAMPER TAKE-OFF ROUND POWER DIAMETER

## INSERT (SLIP-IN)

**D I U P D**  
DAMPER INSERT ROUND POWER DIAMETER

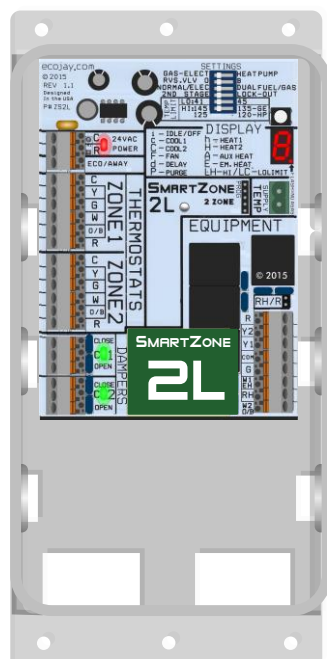


4 ZONE - ZS4X



**CONTROL WITH SMARTZONE®**  
(UP TO 20 ZONES)

2 ZONE - ZS2L



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

**CLUTCH**  
USE THIS BUTTON TO MANUALLY ROTATE THE BLADE 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

## SPRING OPEN / POWER CLOSE

A MOTOR POWERS THE DAMPER CLOSED AND A SPRING OPENS. ONLY 2 WIRES NEEDED. **WARNING:** SPRING DAMPERS CONSUME MORE ELECTRICITY THAN POWER-OPEN/POWER-CLOSE DAMPERS. (10 TO 12 VA WHEN POWERED)

**ROUND DIAMETER:**  
4" TO 16"

**D S U S D**  
DAMPER SUPPLY ROUND SPRING DIAMETER

**SPRING MOTOR ONLY**

**A S D M**



# SMARTZONE® DAMPERS & DUCT SYSTEM

## 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.

IT IS IMPORTANT FOLLOW SOME GUIDELINES TO ENSURE THE MOST EFFECTIVE ZONING INSTALL POSSIBLE. A ZONING SYSTEM CAN TYPICALLY USE THE SAME DUCT SIZING AS A TRADITIONAL SINGLE-THERMOSTAT SYSTEM. HOWEVER, INCREASE THE DUCT DIAMETER BY ONE SIZE FOR EACH ZONE LESS THAN 25% OF THE TOTAL SYSTEM AIR FLOW CAPACITY. ALSO, 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 POSSIBLE, CONNECT DAMPERS DIRECTLY TO THE PLENUM THEN BRANCH OFF SMALLER DUCTS GOING TO DIFFERENT AREAS WITHIN THE ZONES. USING THIS TRUNK/BRANCH DUCT DESIGN WILL MINIMIZE COST (# OF DAMPERS NEEDED) AND REDUCE AIR NOISE.

## 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 EFFECTIVELY IF THEY ARE APPROXIMATELY THE SAME SIZE. **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

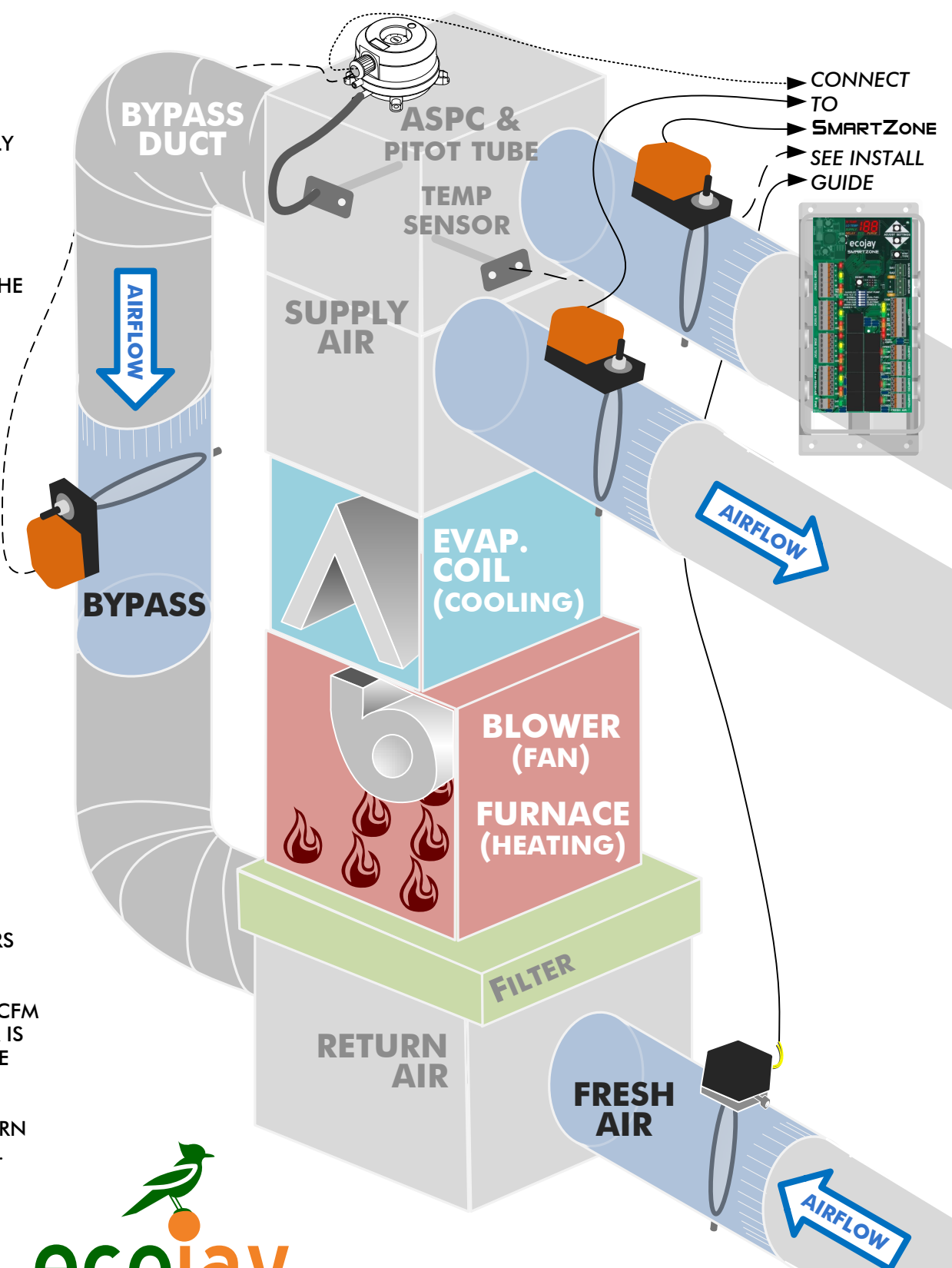
TO MINIMIZE AIR NOISE, INSTALL THE DAMPERS AS CLOSE AS POSSIBLE TO THE SUPPLY PLENUM. A GOOD RULE FOR ACCEPTABLE AIR NOISE IS THAT THE SUPPLY DUCT SHOULD BE DESIGNED TO PROVIDE 600 TO 700 FPM VELOCITY AIRFLOW. USE THE "NORMAL CFM" CHART TO CHECK ROUND DUCT SIZE(S) THAT WILL ACHIEVE THIS VELOCITY RANGE.  
▶ 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 INSIDE PAGE)

## BYPASS AIR

IS ONE OF THE MOST IMPORTANT ASPECTS OF MAKING ZONING WORK. CORRECTLY INSTALLING DAMPERS AND DUCT CAN REDUCE THE AMOUNT OF PRESSURE RELIEF NECESSARY. LEAKING AIR USING MINIMUM OPEN SETTING ON THE DAMPERS OR 2<sup>ND</sup> STAGE LOCKOUT TO REDUCE AIRFLOW WHEN ONLY 1 ZONE CALLING CAN BOTH REDUCE THE AMOUNT OF BYPASS AIR NEEDED. SEE INSIDE PAGE FOR INFO ABOUT BYPASS AIR AND PRESSURE RELIEF

## RETURN AIR

UNDERSIZED RETURN AIR DUCTS/REGISTERS CAN RESULT IN PROBLEMS SUCH AS INCREASED RUN TIME, EVEN EQUIPMENT FAILURE DUE TO INSUFFICIENT AIRFLOW (CFM & VELOCITY). 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.



**ecojay.com**  
888 - 523 - ECOJAY

# BYPASS SIZING

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. NOTE: ALWAYS MEASURE THE AIRFLOW AFTER CONFIGURATION TO ENSURE PROPER OPERATION.

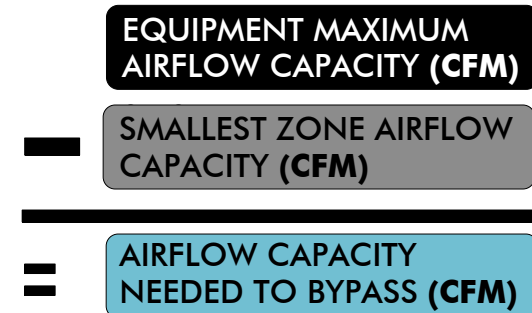
## RULE OF THUMB:

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

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

## SIZING FORMULA:

USE FOR MORE ACCURATE CALCULATION OF THE SIZE BYPASS DAMPER.



### 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"

## RECTANGULAR BYPASS & DUCT SYSTEMS

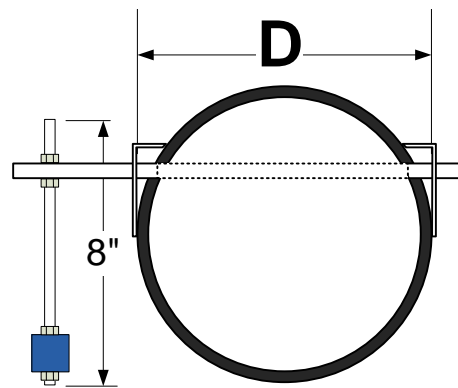
NOTE: SURFACE AREA IN SQ. FT. = ("HEIGHT" X "WIDTH") / 144

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

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

# BAROMETRIC

"WEIGHTED ARM" BYPASS HAS PROVEN RELIABILITY AND QUIET OPERATION.



## DBUBD

DAMPER BYPASS ROUND BAROMETRIC DIAMETER

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

## SPECIFICATIONS

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

# CONFIGURATION

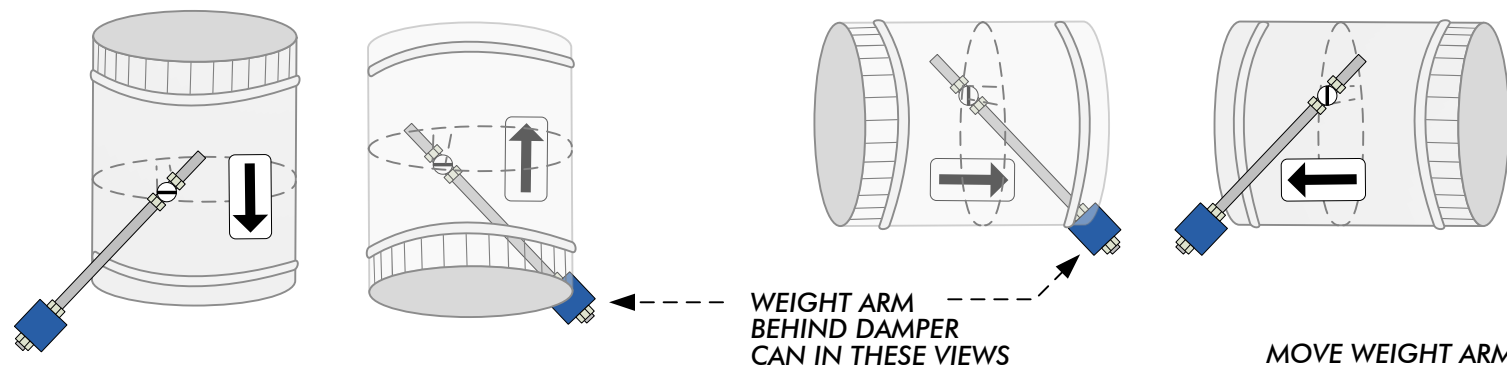
1 WITH BLADE CLOSED, POSITION THE "WEIGHT ARM" IN THE INITIAL POSITION SHOWN BASED ON AIRFLOW DIRECTION

### DOWN-FLOW

### UP-FLOW

### LEFT TO RIGHT

### RIGHT TO LEFT



WEIGHT ARM BEHIND DAMPER CAN IN THESE VIEWS

MOVE WEIGHT ARM THROUGH SHAFT TO ADJUST PRESSURE

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 (~1/2" AT A TIME) UNTIL THE BYPASS DAMPER STARTS TO OPEN SLIGHTLY.

5 MOVE THE WEIGHT AWAY FROM THE SHAFT ~1/4" OR UNTIL THE BYPASS DAMPER REMAINS CLOSED WITH ALL ZONES OPEN & TIGHTEN HEX NUTS AROUND SHAFT

DO NOT LOOSEN THESE NUTS

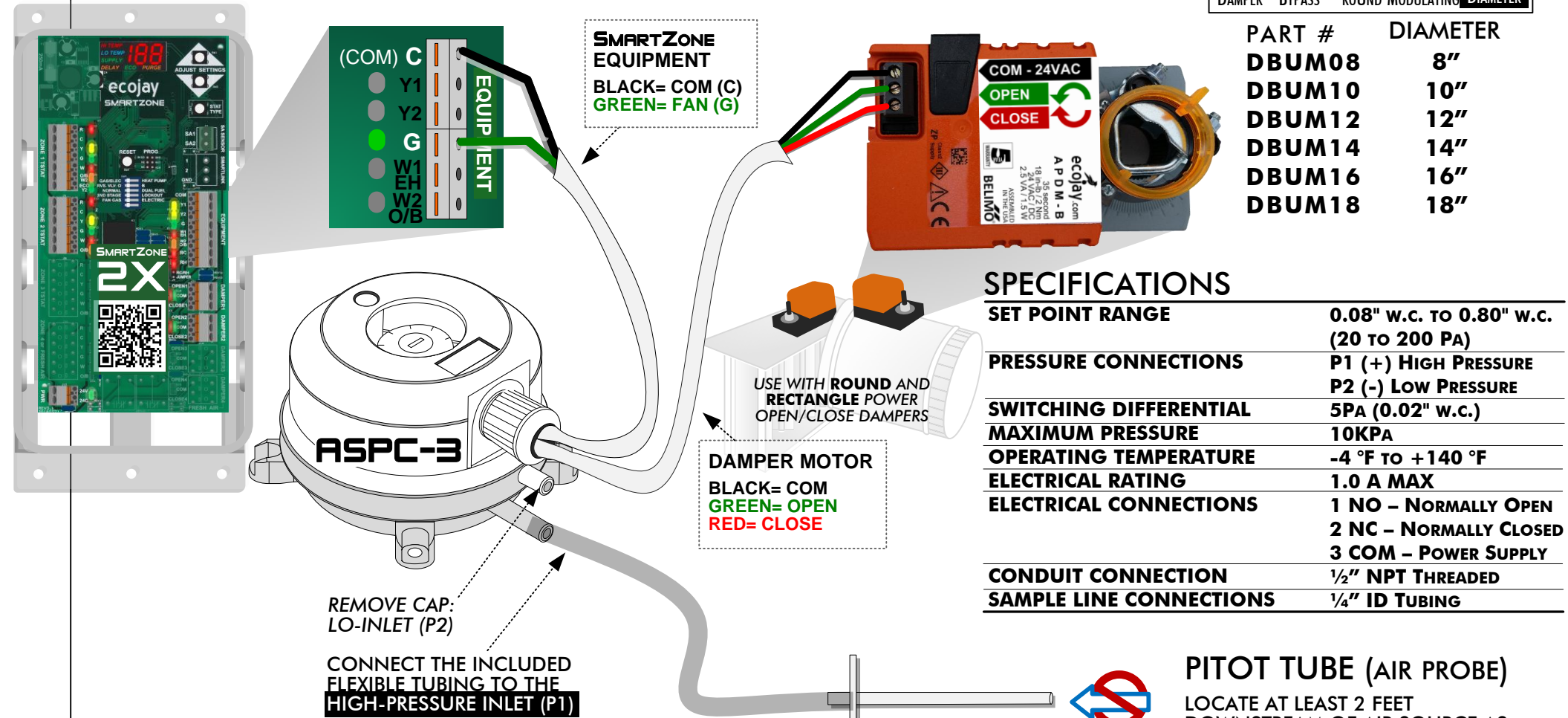
# MODULATING

"STATIC PRESSURE CONTROLLED" BYPASS FOR SUPERIOR AIR NOISE REDUCTION AND PRECISION AIR PRESSURE RELIEF.

## DBUMD

DAMPER BYPASS ROUND MODULATING DIAMETER

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



## SPECIFICATIONS

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

## PITOT TUBE (AIR PROBE)

LOCATE AT LEAST 2 FEET DOWNSTREAM OF AIR SOURCE AS CLOSE TO CENTER OF THE AIRSTREAM POSSIBLE AND WITH THE INLET PERPENDICULAR TO THE AIRSTREAM. ALSO, SEE ILLUSTRATION ON FRONT  
**DO NOT ALLOW SUPPLY AIR TO BLOW DIRECTLY INTO THE PITOT TUBE**

# CONFIGURATION

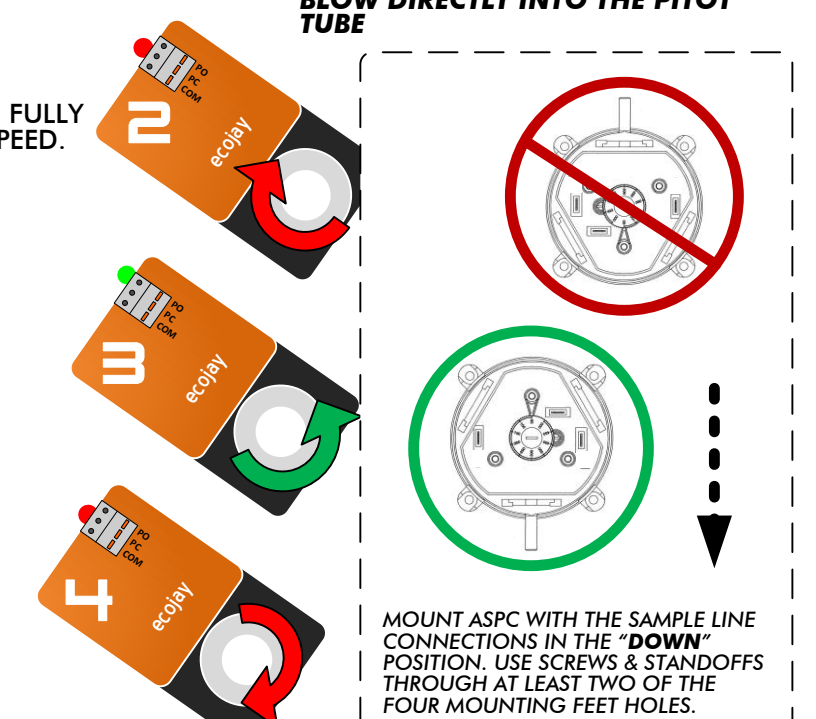
THE BYPASS DAMPER SHOULD OPEN WHEN SOME SUPPLY DAMPERS CLOSE AND SHOULD CLOSE COMPLETELY WHEN ALL DAMPERS ARE OPEN.

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, KEEP TURNING KNOB CLOCKWISE SLOWLY UNTIL IT STARTS CLOSING AGAIN. REPEAT THIS PROCESS, WAITING 20-30 SECONDS BETWEEN ADJUSTMENTS 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)



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

# TESTING

MAKE A CALL COOLING CALL WITH THE SMALLEST ZONE. ONCE THE FAN IS AT THE HIGHEST SPEED, THE BYPASS DAMPER SHOULD MODULATE TO AN "ALMOST" OPEN POSITION. (NOTE: BAROMETRIC BYPASS WILL NOT FULLY OPEN)

# TESTING

MAKE A CALL COOLING CALL WITH THE SMALLEST ZONE. ONCE THE FAN IS AT THE HIGHEST SPEED, THE BYPASS DAMPER SHOULD MODULATE TO AN OPEN POSITION WITHIN 1 TO 2 MINUTES & AIR NOISE SHOULD BE MINIMAL