THERMALLY POWERED
VAV SMART™ DIFFUSERS

Air Quality for the Inside is the Smart Choice

U.S. GREEN BUILDING COUNCIL MEMBER

PERFORMANCE AIR PRODUCTS, INC.

The "Smart" Choice

Performance Air Products, Inc. manufactures thermally powered self-contained VAV "Smart" diffusers as a simple and economical choice for individual room temperature control.

Our square and linear diffusers have been providing occupant comfort in offices, schools, hospitals and retail centers for 25 years. With ever changing climate control needs, our thermostatically controlled diffusers are an efficient means of producing total occupant comfort. Our simple design is based on fewer moving parts to diminish mechanical failure for years of trouble free operation. We have maintained our simple design due to its proven reliability.

Our diffusers have been installed in countless building environments both nationally and internationally. We have sales representatives throughout the United States and abroad.

With twenty five years of field tested experience, our goal is to provide customer satisfaction through cost efficient, energy saving products. We fully support our commitment and product line, all covered by a ten year warranty. Our technical staff is available to answer any questions that you may have regarding our thermal products.

To receive product information, call our toll free number:
800-852-1624
Visit our web site: **www.smartdiffuser.com**
You can also e-mail us at: **papvt@earthlink.net**

Smart Diffusers™ Provide Simple Solutions

The Problem:

As heating and cooling zones grow larger under budget constraints, multiple work spaces are being controlled by a single thermostat. This causes system efficiency to suffer and the occupant complaints to increase. "Thermostat Wars" result as occupants attempt to adjust the thermostat to their own level of comfort.

Finding a way to control heating and cooling within individual work spaces (independent VAV zone controls), with no increase in system costs, is required.

The Solution:

Our solutions are the **Smart Diffusers** from Performance Air Products, Inc.

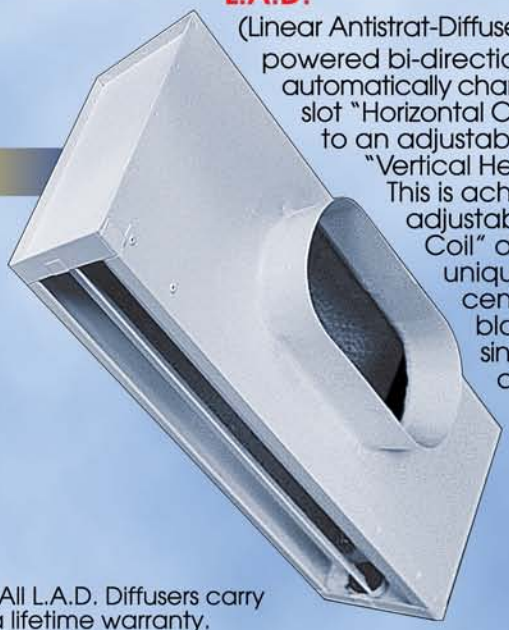
Today's office environment seeks to offer optimum aesthetics, many times at the expense of operating efficiencies. Tenants demand comfort. Owners demand a desirable property, free of operating inefficiencies and with an extended lifespan. Contractors demand systems to meet all of these needs at the lower cost. As a specifier, rarely do you encounter a product that so intelligently addresses all the demands made on you.

Smart Diffusers are a major advancement in HVAC system design, with these features:

- Control functions that automatically adjust the flow from horizontal cooling to vertical heating
- Control functions that automatically adjust temperatures in individual workspaces
- No control wiring, pneumatic piping, or added system pressure required, **Smart Diffusers** are fully self-contained and thermally self-controlled
- No special installation requirements - installed just as "dumb" static diffusers
- No special equipment requirements - single HVAC unit provides multiple VAV zone control
- Virtually maintenance free, **Smart Diffusers** have an almost infinite lifespan
- Size can be standardized - discharge openings are controlled automatically by changes in room temperature with manually adjustable minimum ventilation rates
- Multiple room temperature variations and low flow imbalances are eliminated with the **Smart Diffuser**
- Existing systems are easily upgraded to the various **Smart Diffusers** available

L.A.D.

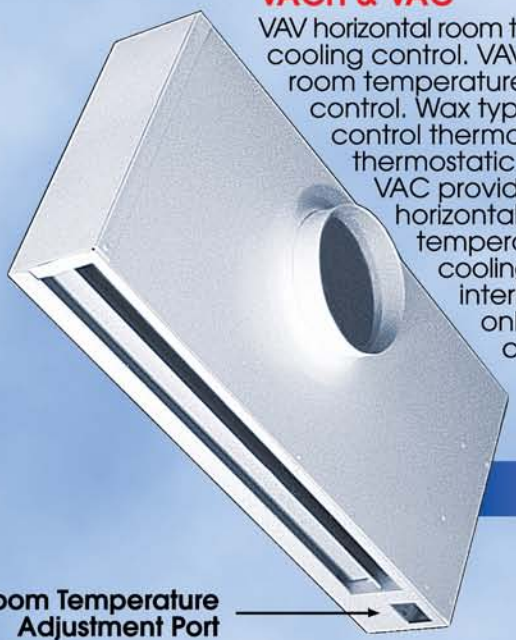
(Linear Antistrat-Diffuser) is a thermally powered bi-directional outlet that automatically changes from a two slot "Horizontal Cooling" position to an adjustable single slot "Vertical Heating" position. This is achieved by an adjustable "Bi-Metallic Coil" attached to a uniquely designed center diffusion blade, utilizing a single moving part configuration.



*All L.A.D. Diffusers carry a lifetime warranty.

VACH & VAC

VAV horizontal room temperature cooling control. VAV vertical room temperature heating control. Wax type VAV control thermal thermostatic actuator. VAC provides VAV horizontal room temperature cooling control for interior cooling only sub-zone control.



Room Temperature Adjustment Port

Clockwise rotation will lower room temperature. Counterclockwise rotation will raise room temperature.

VAV HEATING ROOM TEMPERATURE ADJUSTMENT

To adjust heating set-point rotate red thermostatic actuator. For a cooler room temperature rotate clockwise. For a warmer room temperature rotate counter clockwise.

VAV COOLING ROOM TEMPERATURE ADJUSTMENT

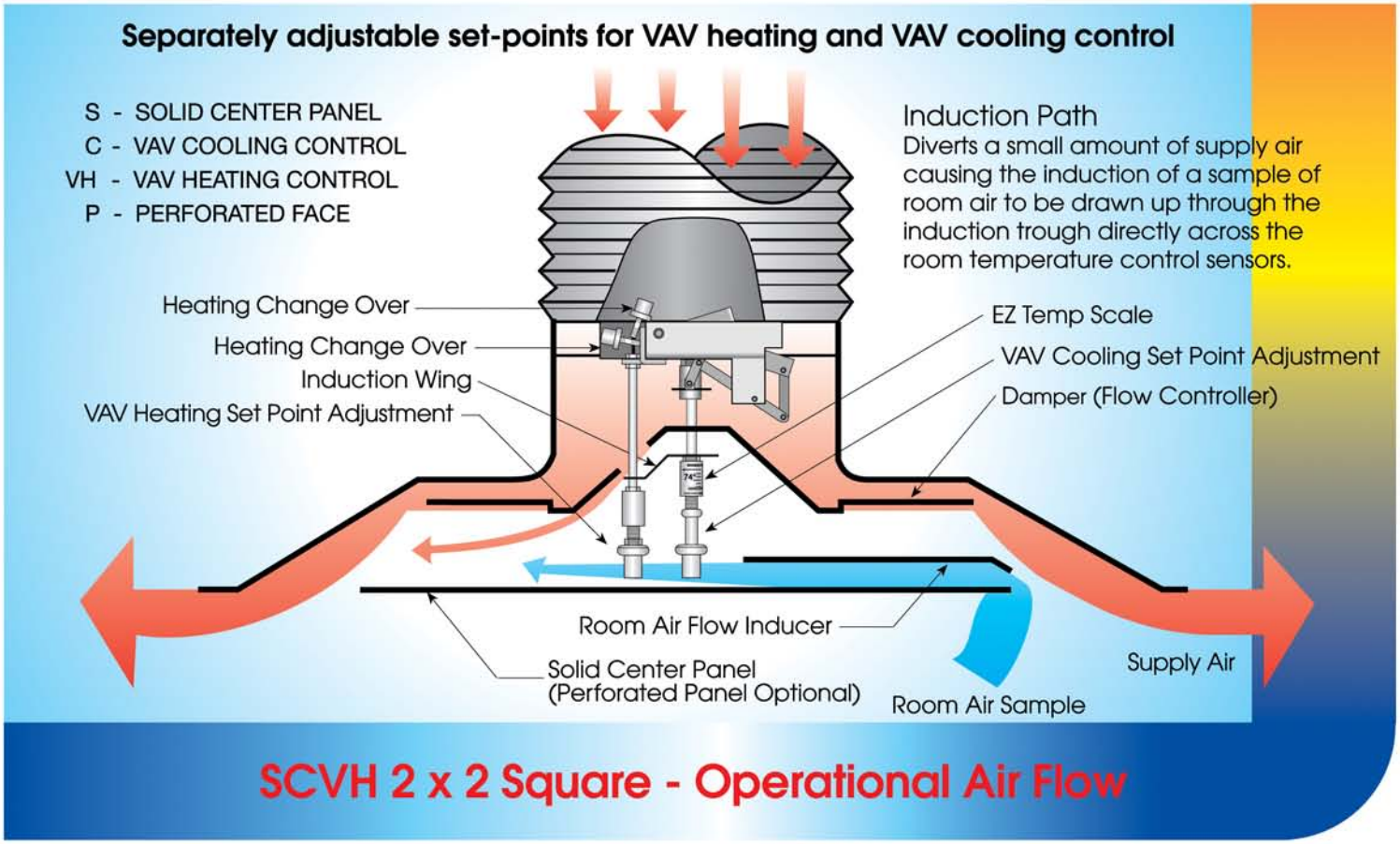
To adjust cooling set-point rotate center thermostatic actuator. For a cooler room temperature rotate clockwise. For a warmer room temperature rotate counter clockwise.

SCVH 2 X 2

Cut away view shows the concealed room temperature control thermostats. One for VAV cooling and another for VAV heating. Each thermostatic actuator is separately adjustable between 72° - 78° F. Factory set point 74° F.

SCAH 2 X 2

VAV Room temperature cooling control with adjustable warm air volume control over-ride provides VAV cooling/adjustable constant volume heating. Factory setpoint of 74° F for cooling. Factory set 1/4 or minimum flow heating. Solid faceplate.



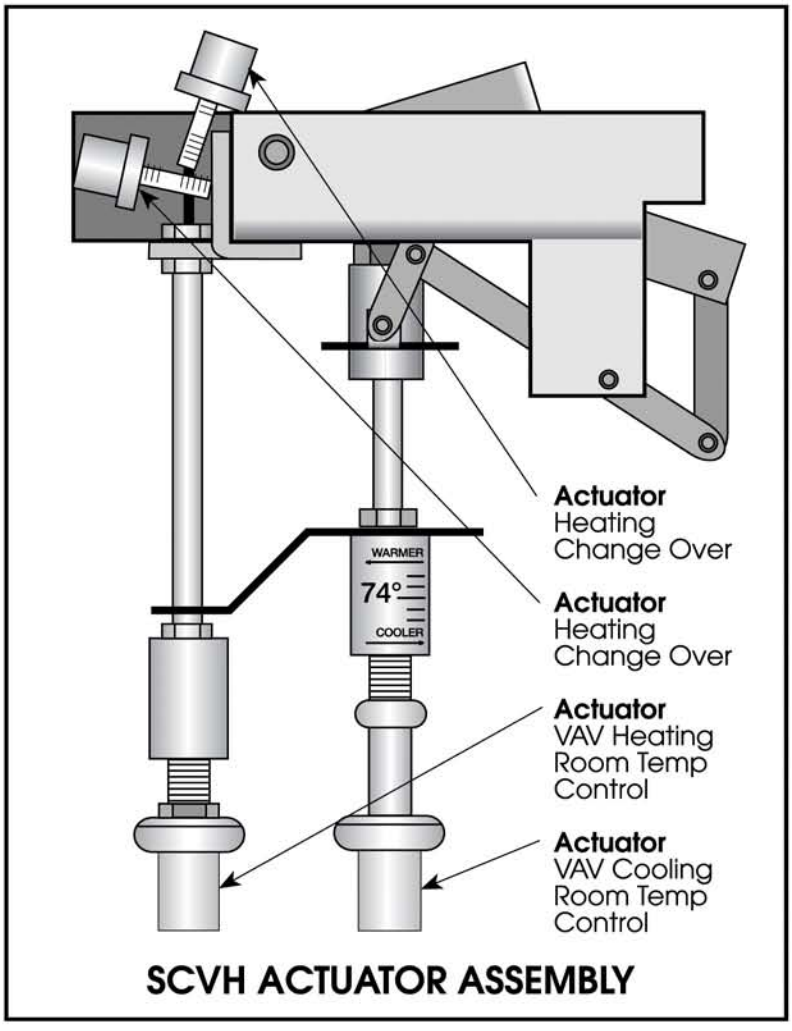
How it works

Model SCVH "Smart" diffuser is a 24x24 ceiling diffuser with a temperature responsive VAV damper. The extruded aluminum damper moves to modulate air flow. The damper is mechanically activated by temperature sensing thermal actuators. The diffuser is completely self contained and self powered. Average room temperature is monitored by inducing a sample of room air across the thermostatic actuators. This is achieved by a simple, yet effective induction wing. A small amount of supply air is diverted away from the thermostatic actuators thus inducing a sample of room air through an induction trough directly across the actuators. Change over between heating and cooling is determined by supply air temperature.

Operation

VAV cooling control is initiated when supply air drops below 68° F. This engages the room temperature control actuator which will sense room temperature and vary the supply air when cooling. A rise in room temperature and the damper will open allowing cool air into the space until desired room temperature is achieved. Set point is adjustable between 72° - 78° F. Factory setting 74° F.

VAV heating control is initiated when supply air rises above 78° F. This engages the heating change over actuators located in the supply path inlet collar. This allows warm air into the space until desired room temperature is achieved. The red room temperature control actuator will sense room temperature and vary the supply air when heating. Set point is adjustable between 72° - 78° F. Factory setting 74° F.



SCVH ACTUATOR ASSEMBLY

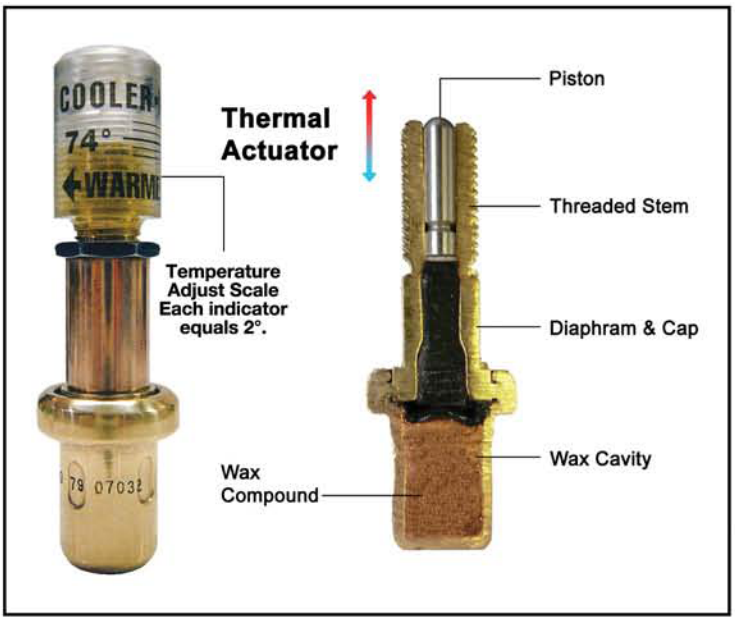
Face Panel Removal

The solid face panel is held in place by four spring clips . To remove the face panel for room temperature adjustments approach panel from the induction trough side (the rectangle opening) reach above panel on both sides with your forefingers until you are able to place your forefingers behind the spring clips. Using your thumbs on the front edge of the panel push the panel back while pulling spring clips forward with forefingers. Lower the panel to hang for hands free adjustments.

Temperature Adjustment

Cooling Adjustment

Smart diffusers factory set to 74° F. For a cooler room temperature rotate actuator clockwise. For a warmer room temperature rotate actuator counter clockwise. Determine room temperature set point by aligning the end of actuator with the indicators on the temperature scale.



Thermal Actuators

Thermal actuators allow heat energy to transform into mechanical energy through the movement of a piston. The actuator is filled with wax that changes from a solid to a liquid when heated, creating expansion. The force created is transmitted to a piston to perform the working stroke.

Heating Adjustment

The room temperature set point is controlled by the red actuator. For a cooler room temperature rotate actuator clockwise. For a warmer room temperature rotate actuator counter clockwise. Each full rotation equals plus or minus approximately 2° F.

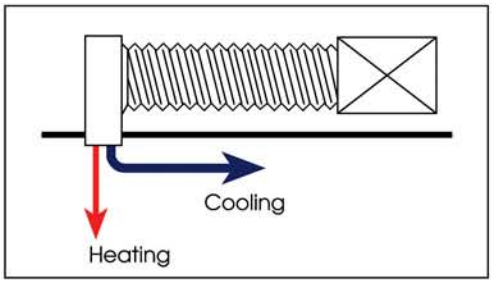
SMART LINEAR DIFFUSERS

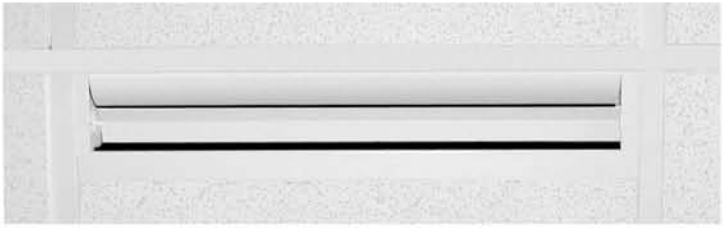
Unlike fixed opening slot diffusers, the patented blade design of linear "Smart Diffusers" give a clean architectural appearance while providing 3 directional slots. Single slot vertical heating and two slot horizontal cooling.The aerodynamic designs ensure optimum mixing of distributed air with room air to prevent dumping,drafts,and dead spots.

CHANGE-OVER
TEMPERATURE ADJUSTMENT

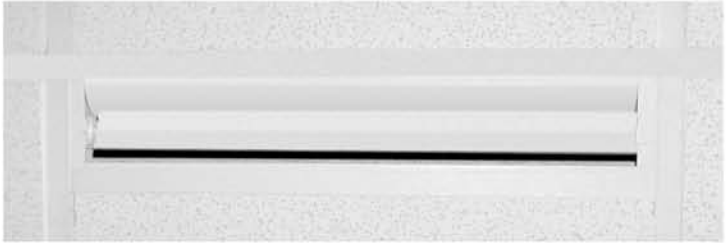
LAD
The LAD "Smart Diffuser" is a supply air temperature responsive, bi-directional outlet. The LAD automatically changes from a two slot horizontal throw to a single slot vertical throw when the heating cycle is initiated. The vertical heating feature will substantially reduce the time required for the heating cycle to be in operation. It will also substantially reduce the temperature of the air stratified at the ceiling level during the heating cycle, thus making return air temperature control a practical function during both cycles.

The application of the LAD "Smart Diffuser" over entry doors is highly recommended. Vertical warm air flow will greatly enhance the comfort level in the same fashion as an air wash. The advantage of automatic change-over, back to horizontal cooling, prevents the disadvantages of vertical cool air diffusion.





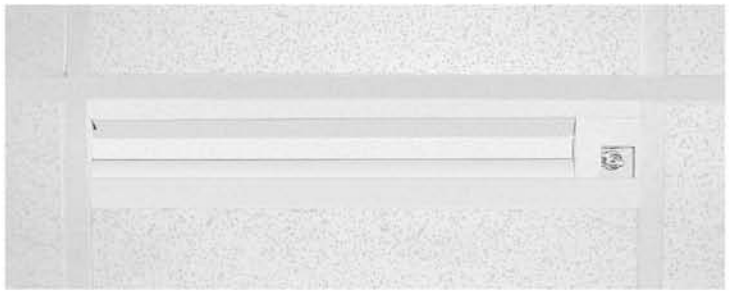
TWO SLOT HORIZONTAL
COOLING THROW



ADJUSTABLE ONE SLOT VERTICAL
HEATING THROW

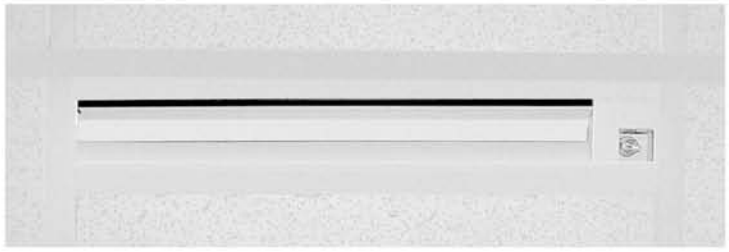
VACH
The VACH "Smart Diffuser" is a variable discharge opening diffuser. Room air is induced past the room thermostatic actuator to vary the discharge opening, thus varying the supply air volume on both the cooling and heating cycles. The operation of the VACH will provide VAV room temperature control in cooling and heating.

Rotating the room actuator clockwise will lower room temperature. Rotating the actuator counter-clockwise will raise room temperature. Each full rotation will equal plus or minus 2° F.



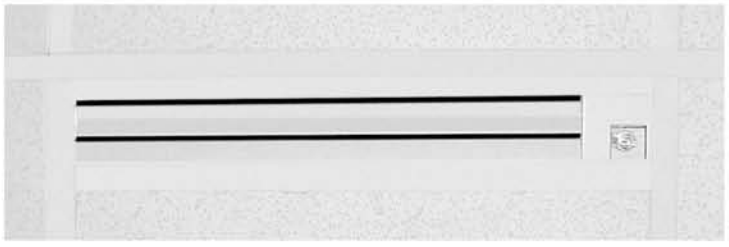
FULL CLOSED VAV ROOM
TEMPERATURE CONTROL

Eliminates over-heating or over-cooling.



ONE SLOT VERTICAL HEATING VAV
ROOM TEMPERATURE CONTROL

All advantages of vertical heating are enhanced by the automatic discharge opening volume adjustment.



TWO SLOT HORIZONTAL COOLING VAV
ROOM TEMPERATURE CONTROL

The coanda effect will be maintained and the throw will remain constant throughout a full-open to a minimum horizontal flow range.

GENERAL SYSTEM APPLICATIONS

The application of **SMART DIFFUSERS** simplify the design and installation of environmental control systems.

LAD linear **SMART DIFFUSERS** are applied to provide horizontal cool air/vertical warm air diffusion for exterior spaces when room temperature control is not required.

VAC linear **SMART DIFFUSERS** are applied to VAV cooling room temperature control systems.

VACH linear **SMART DIFFUSERS** are applied to provide horizontal VAV cooling/ vertical VAV heating room temperature control for exterior spaces.

SC square **SMART DIFFUSERS** are applied to VAV cooling room temperature control systems requiring high volume/short throw.

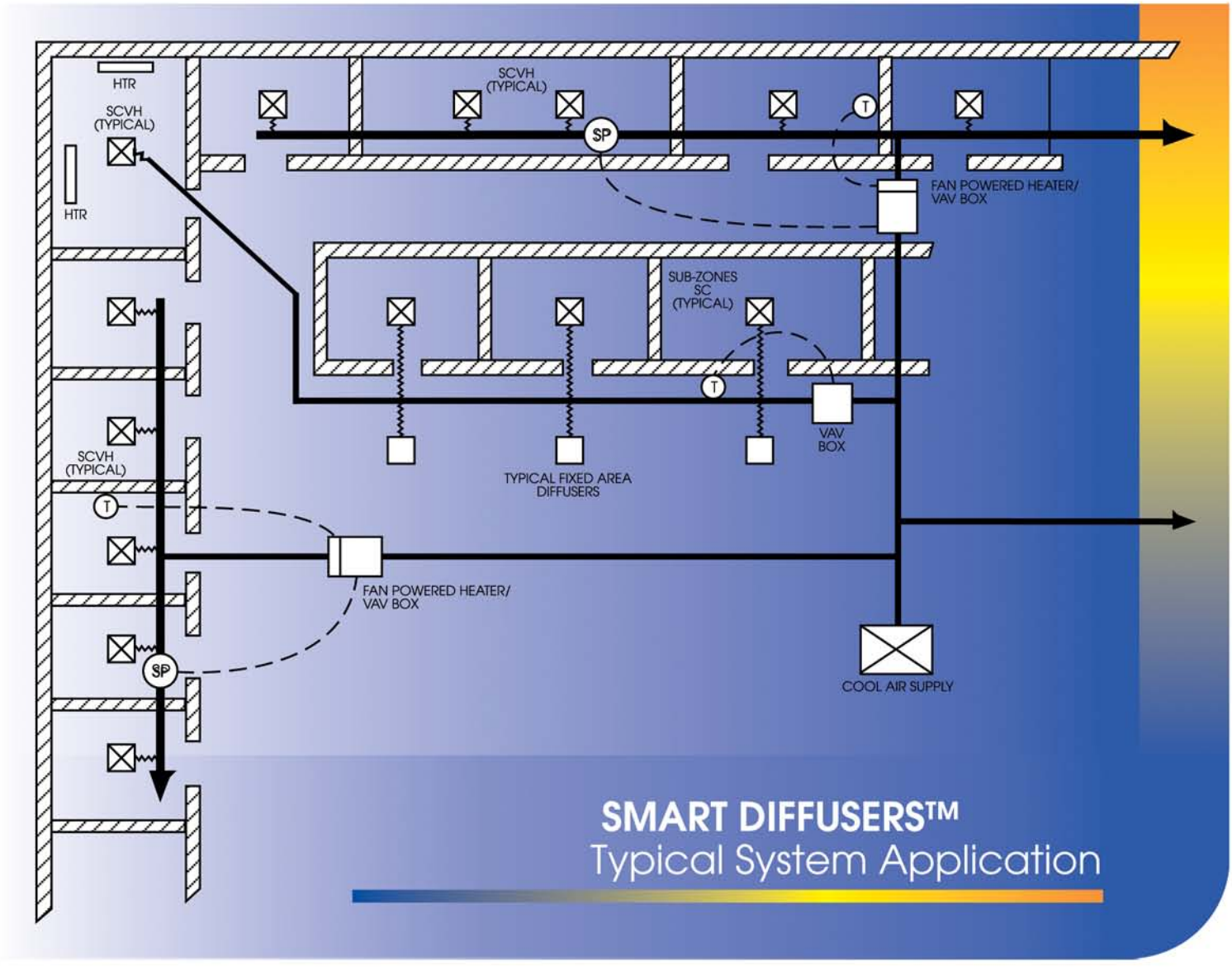
SCVH square **SMART DIFFUSERS** are applied to provide VAV cooling and VAV heating control where the application requires a high volume/short throw.

SMART DIFFUSERS are applied as individual "problem-solvers," or to the entire system to provide superior space temperature control.

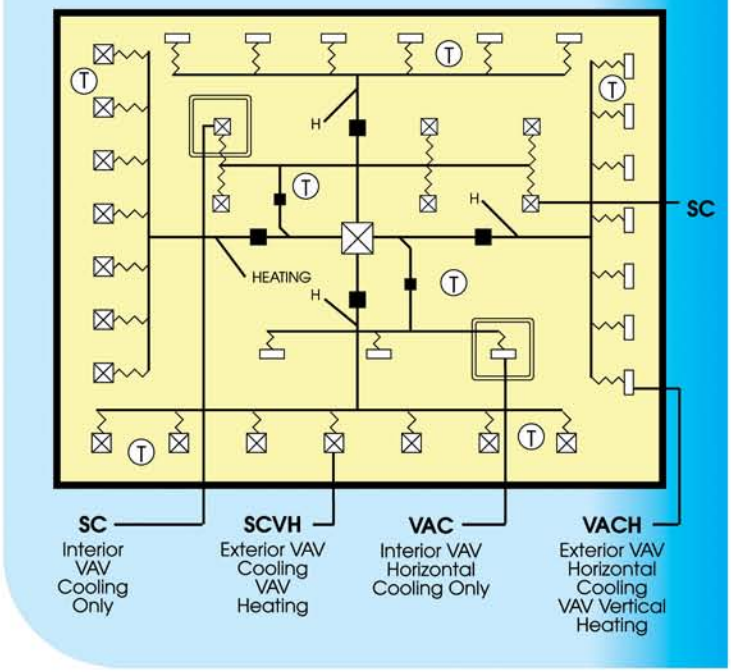
Coanda Effect: The velocity of the supply air stream, as it passes along the ceiling surface, creates a low pressure area along the surface. Maintaining the discharge velocity as the supply air volume is reduced provides a maximum Coanda Effect and eliminates the possible effect of vertical drop of cooler and heavier supply air.

Supply Air Entrainment: The incorporation of surrounding room air into the main supply air path. Maintaining the discharge velocity as the supply air volume is reduced provides maximum entrainment. Maximum entrainment provides the direct path required to change supply air temperature to the average room temperature, therefore absorbing the heat generated within the space.

The **SMART DIFFUSER** is a sub-zone control diffuser. A primary space thermostat must first select the operating mode so the **SMART DIFFUSER** can react with the proper control function.



SMART SYSTEM DESIGN



Exterior space must be served with both cooling and heating while the interior requires cooling only since no heat loss exists.

A single HVAC or heat pump unit provides either cooling or heating. **SMART DIFFUSERS** control the individual space temperatures by varying the volume of the supply air. Spaces requiring cooling during the heating cycle must control to the minimum adjusted volume. The interior space, representing a continuous cooling condition, may be adversely affected during prolonged heating cycles.

One or more HVAC or heat pumps may be combined with the interior cooling unit, or a single cooling unit may be applied with one or more independent heat sources to provide both cooling and heating.

The interior space is generally considered a single temperature control zone since exterior load conditions have little or no effect. Specific areas in which lighting and occupancy are intermittent require individual **SMART DIFFUSER** room temperature control.

Conference rooms require special consideration. A cooling load will exist under all "in use" conditions. Exterior locations will require minimal use heating similar to exterior offices.

The major **SMART DIFFUSER** system design consideration is to provide larger primary cooling/heating exposure cycle control zones and one or more large interior VAV cooling zones. Space thermostats are located in corner offices, or areas in which the "worst condition" exists, to change the zone operating mode between cooling and heating. **SMART DIFFUSERS** provide individual room temperature control based on the primary control cycle. **SMART DIFFUSERS** are applied to individual interior spaces as required.

SMART DIFFUSERS offer a completely efficient, cost-effective, maintenance-free means to control the flow of conditioned air without wall thermostats, duct thermostats, motorized dampers, control wiring, piping, or added system pressure.

Three fundamentally different **SMART DIFFUSERS** are available:

- ✦ Linear directional flow control
- ✦ Linear VAV room temperature control
- ✦ Square VAV room temperature control

The Linear directional control diffuser automatically changes from a horizontal cool air to a vertical warm air discharge. The discharge openings are uniquely different and allow the heating characteristics to be adjusted independently of the cooling.

The hot ceiling/cold floor problems are eliminated. The imbalance of reduced volume/multiple diffuser systems is eliminated.

The Linear VAV room temperature control diffuser incorporates directional flow control to provide horizontal VAV cooling and vertical VAV heating. The discharge openings are automatically varied between the maximum demand and the minimum ventilation volume by changes in the room temperature. The control mode is automatically selected by the temperature of the supply air. The dynamic changes in individual space temperatures are automatically accommodated to provide individual space temperature control.

The Square VAV room temperature control diffuser is ideally suited to high demand volume and short horizontal throw applications. Heating control is provided by limiting the warm air supply volume to the higher of: 1) maximum heating demand 2) minimum ventilation rate.

SYSTEM COMPATIBILITY

SMART DIFFUSERS can be universally applied to most air conditioning equipment designs:

- ✦ Unitary heat pumps and HVAC units
- ✦ Central HVAC, A/C and air handling units
- ✦ Gas, electric, hot water and steam heating systems
- ✦ HVAC, reheat, fan powered, double duct, radiant panels, and baseboard radiation heating methods

Bi-metallic and wax type thermal thermostatic actuators replace wall and duct thermostats, and electric or pneumatic damper actuators.

The control systems are entirely self-contained to eliminate installation, electrical wiring, pneumatic piping, and added system pressures.
Room air is induced past the temperature control elements to provide accurate VAV temperature control. Elements which react to the temperature of the supply air are located within the supply air path.

Control temperature set-points are simply adjusted to provide proportionally modulating control within a restricted temperature span.

APPLICATIONS

The use of a single HVAC unit, applied to provide heating and cooling comfort conditions, in a multiple exposure building, has NOT been universally successful. The major problems can be minimized by using Smart Diffusers:

1. When the heating cycle is in operation, those areas requiring no heat or, in fact, requiring cooling must shut off or they will be over heated.

2. When the cooling cycle is in operation those requiring no cooling or, in fact, requiring heating must shut off or they will be over cooled.

3. The interior space will always represent a cooling load while the exterior space may require either heating or cooling. When the heating cycle is in operation the air flow to the interior space must shut off to prevent over heating.

4. The VAV damper / square "dumb" diffuser systems will over heat then over cool to compensate, then repeat the same. The major functional problem is created during the heating cycle particularly when the heated supply air volume is decreased. The stratification of warm air at the ceiling prevents the space comfort temperature from being obtained or maintained without over heating.

The prolonged operating cycles eliminate the minimum comfort ventilation volumes from being supplied to interior diffuser volumes and demand spaces.

5. When the supply air temperature reset is used to prevent short cycling between cooling and heating the interior diffuser volumes vary between 0 and 250% of that required with a 55° supply air temperature. Interior comfort levels are impossible to maintain.

Smart Diffusers are as applicable to solve the problems of a typical VAV zone as they are to:

a. a single room
b. an exposure
c. an exposure with a corner office
d. 2 exposures
e. 3 exposures
f. the whole building
g. or just an interior room

They are applicable to both new and existing systems. They are applicable to unitary heat pumps, single and multiple HVAC units, central air handlers and large built systems.

Dx or chilled water - Electric, hot water, gas or steam heating - Fan Volume, Fan by-pass or unit by-pass control. "First cost" economics are a major concern in the building or remodeling of any system. But its the first cost versus the total result that is important. Provide a smarter system design. Don't just put in cheaper products.

DUCT LOOP SYSTEMS

The duct loop is a simple method of achieving the same pressure at the nearest and farthest SMART DIFFUSER duct connections.

The main duct(s), between the unit and the loop, are sizes at 1500 to 2000 fpm. The duct is a constant size starting at 1500 fpm. from the main.

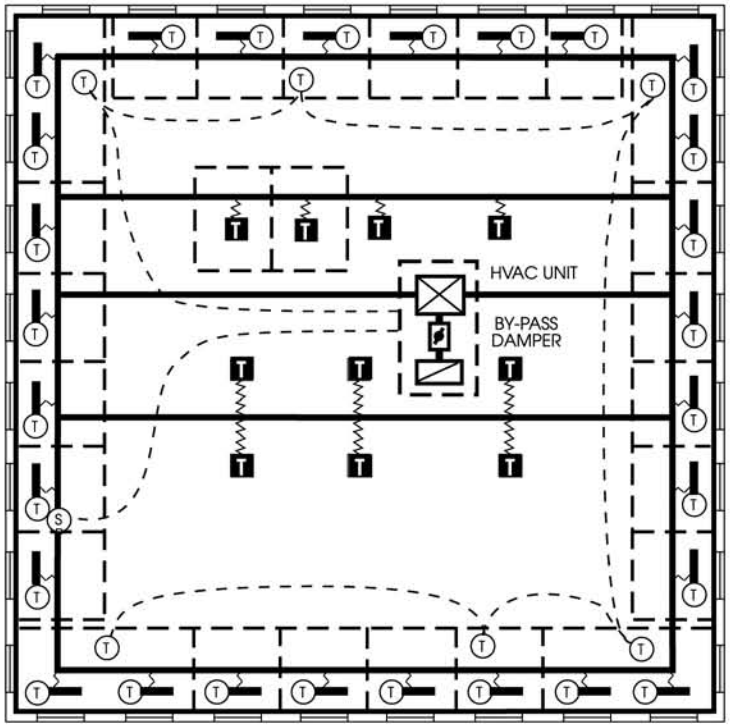
The interior units are sized at the volume demand represented by the lowest differential temperature (8 to 10 degrees cooling).

The exterior units are also sized at the lowest differential temperature to provide the maximum exterior winter cooling demand volumes. Multiple branch ducts are sized at a maximum of .15" wg. loss.

The relief by-pass may also be applicable. It eliminates the need for the by-pass damper and duct loop. The design is the same for any constant volume system.

The SMART DIFFUSERS simply by-pass the excess air not required to satisfy the space temperature. The system remains constant volume while the individual room volumes are varied by the respective room temperatures.

SYSTEM APPLICATION
MULTIPLE EXPOSURE/SINGLE HVAC UNIT
DUCT LOOP SP CONTROLLED

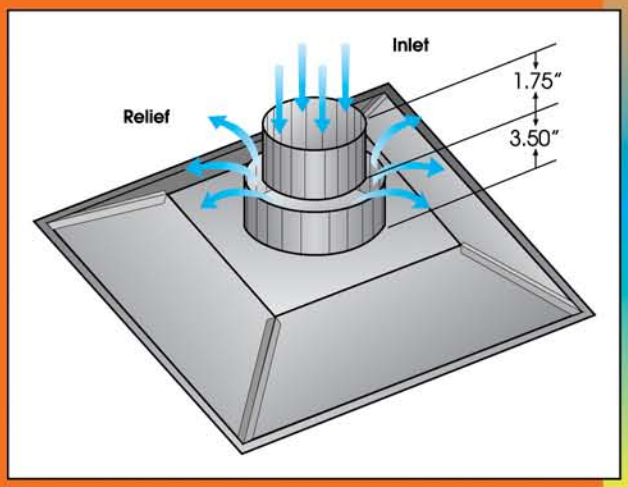


T — VACH

T — SCVH

T — MULTIPLE **"WORST CASE"** ROOM THERMOSTAT CONTROL

S P — S. P. CONTROLLER

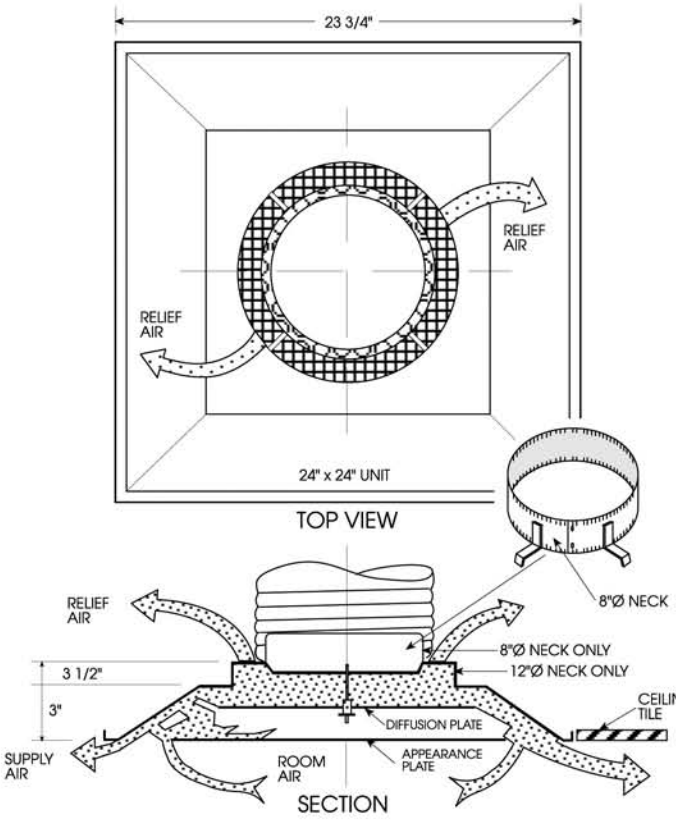


RELIEF TYPE INLET BY-PASS

- Allows supply air not entering through the diffuser to bypass into the space above the ceiling (return air ceiling plenum).
- Available for all VAV control type diffusers.
- Inlet connection of 8", 10" and 12" requires 12" diffuser.
- Relief type diffusers provide a viable alternative to fan by-pass control.
- Available for all 2' x 2' square diffusers in diameters of 6", 8", 10" and 12".
- Inlet connection of 6" requires 10" diffuser.

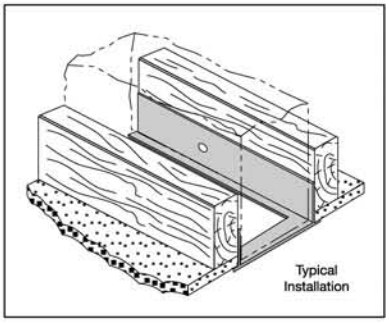
RELIEF TYPE SMART DIFFUSERS

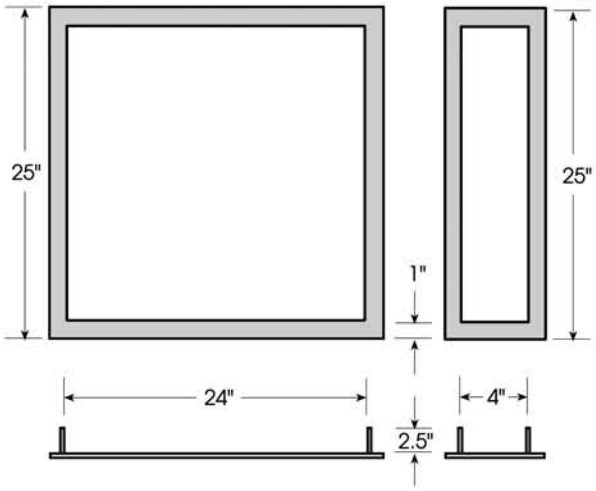
Relief type Smart Diffusers provide a viable alternative to fan by-pass or system pressure control. Square Smart diffusers are equipped with an inlet relief collar adapter and are included as an integral part of all SCAH/R units and are easily attached by aligning slots with Smart diffuser collar legs then attaching the two relief collar legs to outside of Smart diffuser collar and install two screws. Discharge of supply air, at full volume creates a slightly negative pressure in the by-pass opening. The closure of the volume control plate creates a positive pressure, allowing the excess supply air to be redirected into the ceiling air space. The primary design consideration is to limit the maximum duct pressure, to approximately the same pressure as the downstream of a VAV box. Static pressure levels at .30"wg develop N.C. levels which exceed N.C .30 or a .20"wg control pressure results in N.C .20 or less. The relief by-pass type units prevent S.P. levels from exceeding .20"wg without the use of S.P. controllers and dampers. The application of relief by-pass type units prevents the Smart diffusers from exceeding their catalogued maximum N.C. volume levels.



HARD CEILING/PLASTER FRAMES

Ceiling frames are available for "Smart" diffuser applications other than lay-in. The frame is installed in the opening and attached through the frame with screws or nails. The frame may also be installed and supported by suspension wires (see illustration of typical installation).



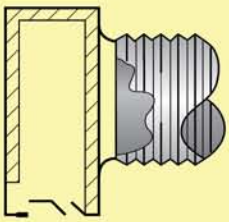


DIRECTIONAL BAFFLES

Directional baffles can be used to provide blow patterns other than 4-way. Available blow patterns are:

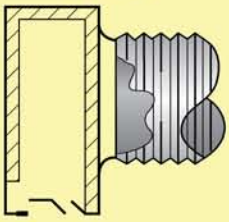
3-way blow
2-way blow
1-way blow
2-way corner blow
2-way opposing blow

LAD



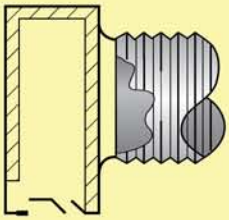
- Horizontal Cool Air/Vertical Warm Air Throw Adjustable Cool Air Discharge Opening
- Adjustable Warm Air Volume/full closed minimum allows interior application for HVAC units.
- Bi-metallic Coil Control Thermal Thermostatic Actuator

VAC



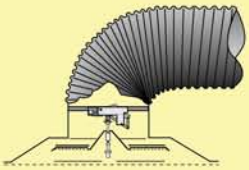
- VAV Horizontal Room Temperature Cooling Control for interior cooling only sub-zone control
- Wax Type VAV Control Thermal Thermostatic Actuator

VACH



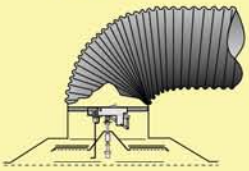
- VAV Horizontal Room Temperature Cooling Control
- VAV Vertical Room Temperature Heating Control
- Wax Type VAV Control Thermal Thermostatic Actuator
- Wax Type Minimum Stop Position Thermal Thermostatic Actuator

SC



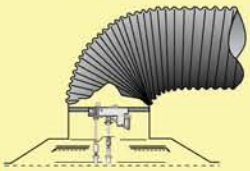
- 6"/8"/10"/12" Inlet Duct Connections
- VAV Room Temperature Cooling Control for interior cooling sub-zone control
- Wax Type VAV Control Thermal Thermostatic Actuator

SCAH



- 6"/8"/10"/12" Inlet Duct Connections
- VAV Room Temperature Cooling Control with Adjustable Warm Air Volume Control Over-Ride. Control provides VAV cooling/adjustable constant volume heating control

SCVH



- 6"/8"/10"/12" Inlet Duct Connections
- Wax Type VAV Control Thermal Thermostatic Actuator
- VAV Heating Control
- VAV Cooling Control

LINEAR SMART DIFFUSER PERFORMANCE GUIDE

CFM	SIZE	INLET	THROW	P_t	NC
50	2 ft.	8"	1-1-5	<.01	<20
100	2 ft.	8"	3-7-13	03	<20
	3 ft.	9"	1-3-11	02	< 20
	4 ft.	10"	1-1-7	<.01	<20
150	2 ft.	8"	7-13-17	.04	22
	3 ft.	9"	3-7-15	.03	<20
	4 ft.	10"	1-4-13	.01	<20
200	2 ft.	8"	11-14-19	08	33
	3 ft.	9"	6-11 -16	.06	21
	4 ft.	10"	3-7-14	.04	<20
250	2 ft.	8"	13-16-22	.14	37
	3 ft.	9"	3-13-17	.09	27
	4 ft.	10"	5-10-16	.07	<20
300	3 ft.	9"	10-14-19	.15	32
	4 ft.	10"	7-13-17	.10	24
400	4 ft.	10"	11-14-19	15	32
500	4 ft.	10"	13-15-21	.27	38

Throw values (ft) are based on following terminal velocities:

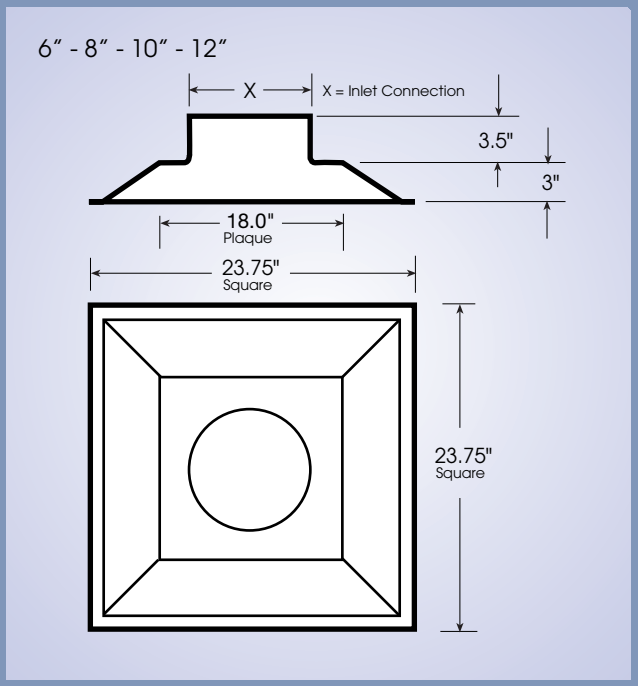
Maximum	150 FPM
Typical	100 FPM
Minimum	50 FPM

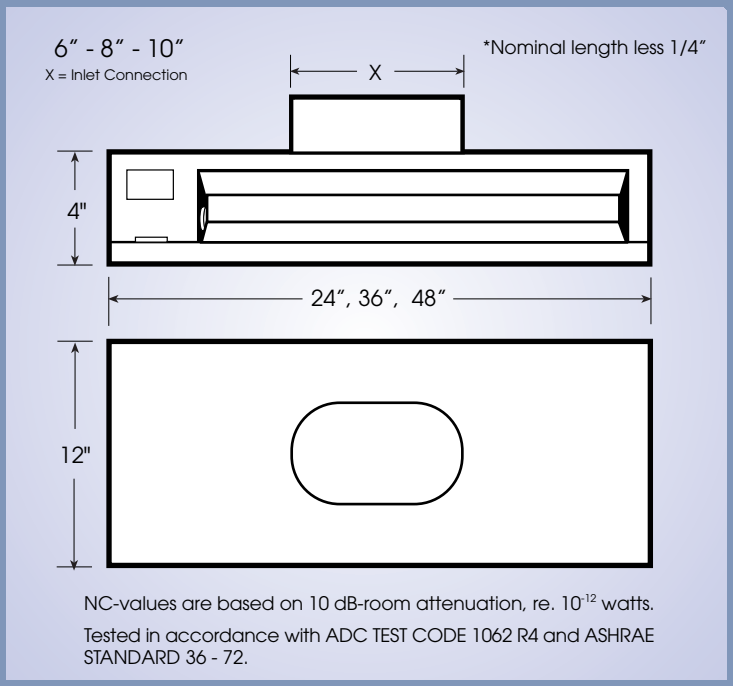
"2 x 2" SQUARE DIFFUSER PERFORMANCE

Listed Size	Inlet SP In. WG	Max. CFM	Throw@ Max. CFM V_t50	V_t100	V_t150	Throw@ 25% of CFM V_t50	V_t100	NC@Max. CFM*
6"	.05	85	5	3	1	3	1	*
	.10	120	6	3	2	3	2	20
	.15*	150	7	4	2	4	3	24
	.20	170	8	5	3	6	4	28
	.25	220	8	6	5	7	4	33
8"	.05	160	6	4	2	4	2	*
	.10	225	8	5	3	5	3	20
	.15*	275	9	5	4	6	4	25
	.20	320	10	6	5	8	5	29
	.25	355	12	7	6	9	6	33
10"	.05	250	7	4	3	5	3	*
	.10	355	9	5	4	6	4	22
	.15*	450	11	6	5	7	4	26
	.20	500	12	7	6	8	5	29
	.25	580	13	8	7	10	7	32
12"	.05	365	8	5	4	6	4	*
	.10	520	11	7	6	8	5	23
	.15*	650	12	7	6	8	6	27
	.20	740	14	8	7	10	7	32
	.25	820	15	10	9	11	8	36
	.30	890	17	11	10	12	9	40

* Denotes nominal rating. NC based on L_w (10^{-12} watts reference) -10db
Tested in accordance with ANSI /ASHRAE 70-1991, ANSI S12.31, ARI890-94, ISO5219 and ISO 3741

DIMENSIONAL DATA





NC-values are based on 10 dB-room attenuation, re. 10^{-12} watts.

Tested in accordance with ADC TEST CODE 1062 R4 and ASHRAE STANDARD 36 - 72.

VACH/VAC GUIDE SPECIFICATIONS

Variable air volume thermally powered linear type diffusers shall be Smart™ models VACH/VAC manufactured by **PERFORMANCE AIR PRODUCTS, INC.**

The operation of the VACH diffuser shall provide horizontal VAV cooling control and shall provide vertical flow VAV heating control. The operation of the VAC diffuser shall provide 2 slot horizontal VAV cooling control only. The VAV diffusers shall have positive induction of secondary room air over the room thermostat at all flows from full open to full closed.

The cooling/heating set point shall be field adjustable within a 72° - 78° F by turning the room temperature sensing thermostat located at one end of the diffuser within the induction port, through which the room air is induced past the thermostatic actuator to provide VAV room temperature control.

The diffuser shall be complete with the plenum constructed of 24 gauge galvanized sheet steel, and shall be lined with 1/2 inch, 2 pound density black matte face fiberglass insulation bonded by NFPA 90A approved adhesive.

SC/SCAH/SCVH GUIDE SPECIFICATIONS

Variable air volume diffusers shall be "Smart" diffusers. Models SC, SCAH, SCVH plaque type ceiling diffusers as manufactured by **PERFORMANCE AIR PRODUCTS, INC.**

Each diffuser shall be a complete VAV terminal and thermostat self-powered, self-contained in a 24x24 diffuser. Face panel shall be one piece, smooth design. Panel shall be free of holes, plugs or slots. Each diffuser damper shall consist of an aluminum extruded disc to provide a variable, unobstructed 360 degree horizontal discharge for maximum Coanda effect. Foam perimeter seal provided.

Each diffuser shall utilize one or more temperature sensing thermal actuators to vary the supply air volume to provide both VAV heating and VAV cooling.

All diffusers shall have a temperature adjustment scale with indicators that range from 70-78° F. The initial set point shall be factory set at 74° F. No tools shall be required.

Model SC VAV cooling diffuser shall utilize one thermal actuator to provide VAV room temperature control for cooling. A rise in room temperature and the damper shall modulate responding to cooling set point. Note: SCW models are equipped with non adjustable warm-up cycle control function. When the supply air temperature is above 72° F, the disc will be open regardless of the room temperature. When cool air is supplied, the disc will close but only if the room temperature is below the set point. Model SCAH VAV cooling with adjustable heating control diffuser shall utilize three thermal actuators. Two thermal actuators located in the supply path shall provide constant volume heating. Heating supply volume shall be adjustable from full open to full close. Factory heating volume set to minimum flow, 1/4" open. A third thermal actuator shall provide VAV cooling control.

Model SCVH VAV heating and VAV cooling shall utilize four thermal actuators to provide both VAV heating and VAV cooling control. Diffuser is equipped with two room temperature sensing thermal actuators and two heating change over thermal actuators. The room temperature settings for heating and cooling shall be separately adjustable. One room actuator shall sense temperature and vary the supply air when cooling. The second actuator shall sense room temperature and vary the supply air when heating. The heating change over actuators shall be factory set to engage heating mode when supply air temperature rises above 78° F and will return to cooling mode when supply air temperature falls below 68° F.

Diffusers shall have a removable face panel attached to four spring clips. Face panel shall have the option to detach from two spring clips and hang down allowing hands to be free for adjusting set points. Room temperature set point adjustments shall be made by rotating the proper thermal actuator. Adjustment instructions shall be on the inside of the face panel. No tools shall be required.

The diffuser shall be constructed of 24 gauge galvanized steel. The diffuser shall have an integral drawn inlet. Diffuser finish shall be satin white.

PERFORMANCE AIR PRODUCTS 10 YEAR WARRANTY

PERFORMANCE AIR PRODUCTS, INC., thermal diffusers shall be free from defects in material or workmanship for period of 10 years from the date of shipment, and agrees to repair or replace at its option any parts that fail during said 10 year period, provided reasonable care has been taken during installment and all parts remain unaltered with units given proper and normal usage.

This warranty expressly excludes any and all field labor required to exchange, test or service the Performance Air Diffuser. **PERFORMANCE AIR PRODUCTS, INC.**, will not be responsible for removal or re-installment costs.

PERFORMANCE AIR PRODUCTS, INC., shall not be responsible for freight costs to or from its plant in connection with the inspection, repair, or replacement of Diffuser parts under the terms of this limited warranty.

PERFORMANCE AIR PRODUCTS, INC., in no event shall be liable for incidental indirect or consequential damages resulting in injury or damages of persons or property.

PERFORMANCE AIR PRODUCTS, INC.

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