

AIR DISTRIBUTION
PRODUCTS

PRODUCT:
SOLAR PLEXICON



F O C U S
05



ADVANCING THE SCIENCE OF AIR DISTRIBUTION

Rethink what air management systems can be.
Revise your notion of functionality.
Redefine your comfort zone.™



Comfort, Redefined.

Since 1946, Titus has focused on technologically advanced products that create the highest degree of comfort.

We've consistently led the industry by breaking the barriers of expectation and convention when it comes to technology. We've redefined how technology drives, influences and supports air management. And by being first to market with the most innovative approaches to air distribution, we're proud to say that the marketplace has taken notice, and is counting on us to lead the way into the next decade. A challenge we're more than happy to accommodate.

Titus has raised the bar on design, proving that functional can also be beautiful. And we've redefined what it means to be energy efficient, with a collection of smart technology products that optimize the use of natural resources.

Titus has also redefined what it means to work with an air management products partner. We pride ourselves on listening and responding so that we can not only meet expectations, but also exceed them. Service has been, and will always be, our main focus at Titus. And, it's why so many of our customers keep coming back.

Welcome to your new comfort zone. It starts here.

Overview



Engineers tour the Comfort Zone lab to learn about the advantages of the Solar Plexicon

Displacement ventilation is growing in popularity as engineers and design professionals seek to use air distribution systems that are ultra efficient and occupant friendly. The benefits of displacement ventilation include energy savings, and the highest level of indoor air quality (IAQ) of any HVAC system in the market. An additional factor, the cost of the system, is also driving the decision process toward displacement. One reason cost has become so important is the fact that more and more designs with displacement ventilation are also calling for a supplementary heating system as well. Since heating from a traditional displacement system is not possible, providing a second HVAC system to heat the occupied space presents challenges on the cost, design, and installation sides.

To provide a solution, our design team created the DVIR-HCS Solar Plexicon dual-function diffuser. The Solar Plexicon addresses the heating problem by incorporating two air distribution delivery methods - stratified and mixed

ventilation, into one diffuser assembly with a single supply duct connection. The Solar Plexicon uses displacement principles to cool and mixed airflow principles to heat the occupied space. The design features two separate internal plenums that provide separate air passage ways for cooling and heating. The front plenum is ducted to a DVRI face to provide displacement cooling. The rear plenum in the unit is ducted to a CT diffuser located at the bottom of the diffuser to provide heating from the floor level. Pattern controllers were added to the CT to provide additional spread in heating mode. The result is a unique dual-function diffuser that provides an optimum level of cooling and heating per ASHRAE without the need for a secondary heating system.

To power the auto-changeover action when changing to the cooling or heating mode, the Solar Plexicon utilizes the same wireless, energy-harvesting platform that is found in the EOS solar diffuser. The energy-harvesting process that drives the auto-changeover function is achieved by using

solar light energy to power the unit. Two miniature motor/actuator assemblies are mounted internally and connected to dampers. Each assembly is powered by solar panels mounted on the unit that gather sun and ambient room light and stores the energy on a capacitor. An internal circuit board houses the energy storing capacitor, temperature sensing device, and specially programmed algorithmic logic to regulate actuation changeover time and sequence. The unit “wakes up” every 10 minutes to check the room and supply air temperature and logs both. When an air temperature is recorded out of the pre-set dead band, the smart logic instructs the diffuser to change the blade position for either heating or cooling. If the temperature that is recorded calls for heating, the logic instructs the actuator to direct the airflow to the CT diffuser for mixed airflow heating. If the temperature that is recorded calls for cooling, the logic instructs the actuator to direct the airflow to the DVRI face for low velocity displacement cooling.

FLEXIBLE DESIGN

The Solar Plexicon is designed to operate with all types of HVAC systems in the market (Single Duct, Dual Duct, Fan-Powered, DX, etc.). To accomplish this, the unit was created with a narrow temperature band for the cooling and heating changeover actuation. The default values for the band are 78 degree F. for heating and 71 degree F. for cooling. In addition, the changeover set-points are

adjustable. Each default set-point can be adjusted in one 2-degree increment up or down. This provides maximum flexibility by allowing the installing contractor to customize the band to fit any type of HVAC system they may be using. At the narrowest point, the band can be adjusted to 73 degrees F. for cooling and 76 degrees F. for heating. The band can also be expanded to 11 degrees or shifted up or down in 7 degree increments depending on system requirements.

SAVING TIME AND MONEY

The benefits of the Plexicon unit can be seen throughout the building process. Design engineers don’t have to worry about designing and integrating a secondary system for the heating requirements. This saves valuable time and energy during the planning and design phase. Contractors can save time and money since they don’t have to install a secondary air delivery system that includes additional ductwork, diffusers and controls. The building owner doesn’t have to pay for the second system which saves money on the overall project. Finally, the building occupants can enjoy the highest level of thermal comfort and indoor air quality delivered by low velocity displacement cooling, or mixed airflow heating from the floor level. With the Solar Plexicon, Titus continues to redefine your comfort zone in new and innovative ways.

DVRI-HCS (Solar Plexicon)

HEATING & COOLING DISPLACEMENT UNIT - SOLAR POWERED

- » Ambient light-powered diffuser that combines heating and cooling from unit
- » Can contribute toward energy savings
- » Easily adjustable air pattern controllers to change airflow spread pattern
- » Standard finish is #26 white (powdercoat)
- » Woodgrain finish options available
- » Mounting base and telescopic duct cover are available as accessories



dual-function



light powered



wood grains



smart logic



energy solutions

DVRI-HCS (Solar Plexicon)

The DVRI-HCS “Solar Plexicon” is a solar-powered, energy-harvesting dual-function diffuser that combines displacement ventilation and mixed air from one unit. It provides displacement cooling from the top section and traditional heating from the bottom section of the diffuser.

ADVANTAGES

- Both internal plenums are connected to motor/actuator assemblies that provides the auto-changeover action for cooling & heating
- Solar cell mounted on face collects light energy and stores on internal capacitor
- Smart logic programming on internal P.C. board checks supply air temperature in 10 minute intervals
- Cooling section features easily adjustable air pattern controllers for spread pattern adjustment

Wood grain Finish Options

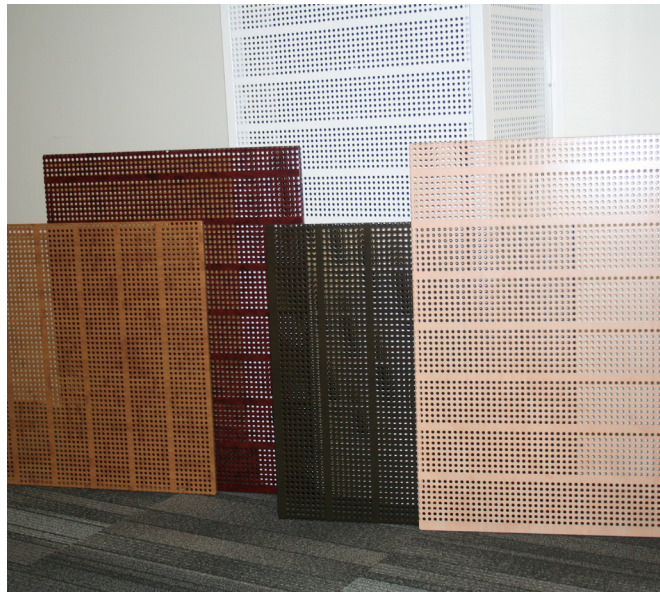
As sustainable design elements continue to dominate the commercial building industry, building owners, architects and engineers are looking for new and environmentally responsible solutions for everyday building needs without sacrificing performance or aesthetics. Titus' wood grain finishes offer an appealing substitute for wood and natural stone without harming the environment. Wood grain finishes allow for conservation of our natural resources while also offering a durable cosmetic alternative to conventional finishes with low-to-no VOCs.

BENEFITS

This dye sublimation process provides a finish that realistically resembles wood and stone, and is durable enough to be used in high traffic architectural applications. In spaces where wood floors, ceilings or paneling are used, and architects would rather not see the required HVAC equipment, there are only a few options available such as using borderless installation methods, or paint and veneers which chip easily. The Titus wood grain finishes are so real and natural looking, you have to touch them to recognize the difference; and durable enough to be used in any architectural application.

Unlike natural wood, Titus' wood grain finishes are easy to clean and do not require the constant upkeep as wood products. They are available in either a smooth gloss or textured finish and will not deteriorate due to moisture, temperature extremes or corrosion. And of course you will never have to worry about termites. They will give you the look of high end wood grains, marbles, and granites with the durability of powder coating.

Additionally, wood grain finishes offer high resistance toward all atmospheric agents and are resistant to heat, acids, humidity, salt, detergents and UV. All of the powders used are made in a TGIC free super durable formulation and meet the performance requirements listed in AAMA 2603 and AAMA 2604-2.



As the architectural industry searches for alternative materials to meet the growing demand for LEED and GREEN builds, Titus is proud to say that we are the first commercial HVAC company to bring this cutting edge technology to the U.S. market.

Redefine your HVAC aesthetics with high-performance metal products that look like wood and stone. There is really no limit to what you can create when you redefine your comfort zone.

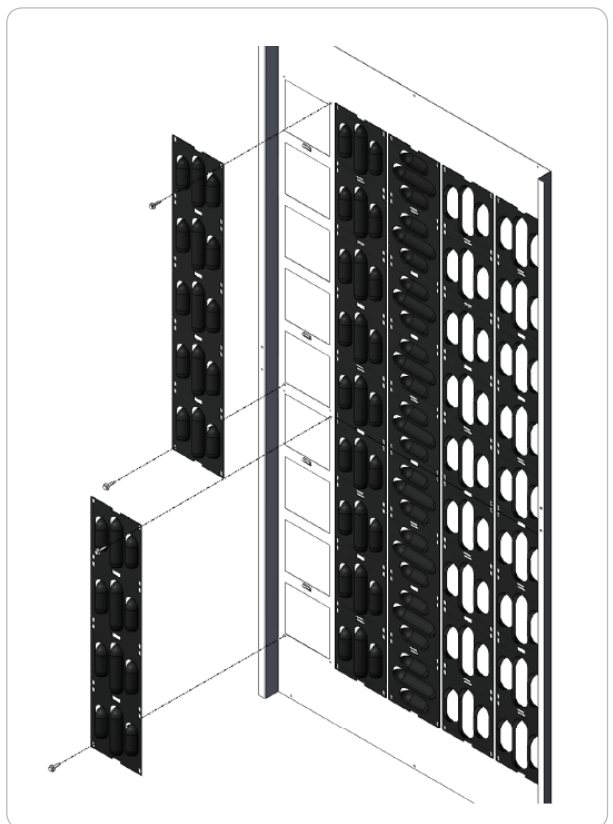


TRADITIONAL LAYOUT OPTION FOR A CLASSROOM

Titus Displacement diffusers feature integral variable air pattern controllers located in the unit behind the perforated face. These pattern controllers can be removed and repositioned to change the adjacent zone pattern from the diffuser face. To adjust the pattern: (see illustration).

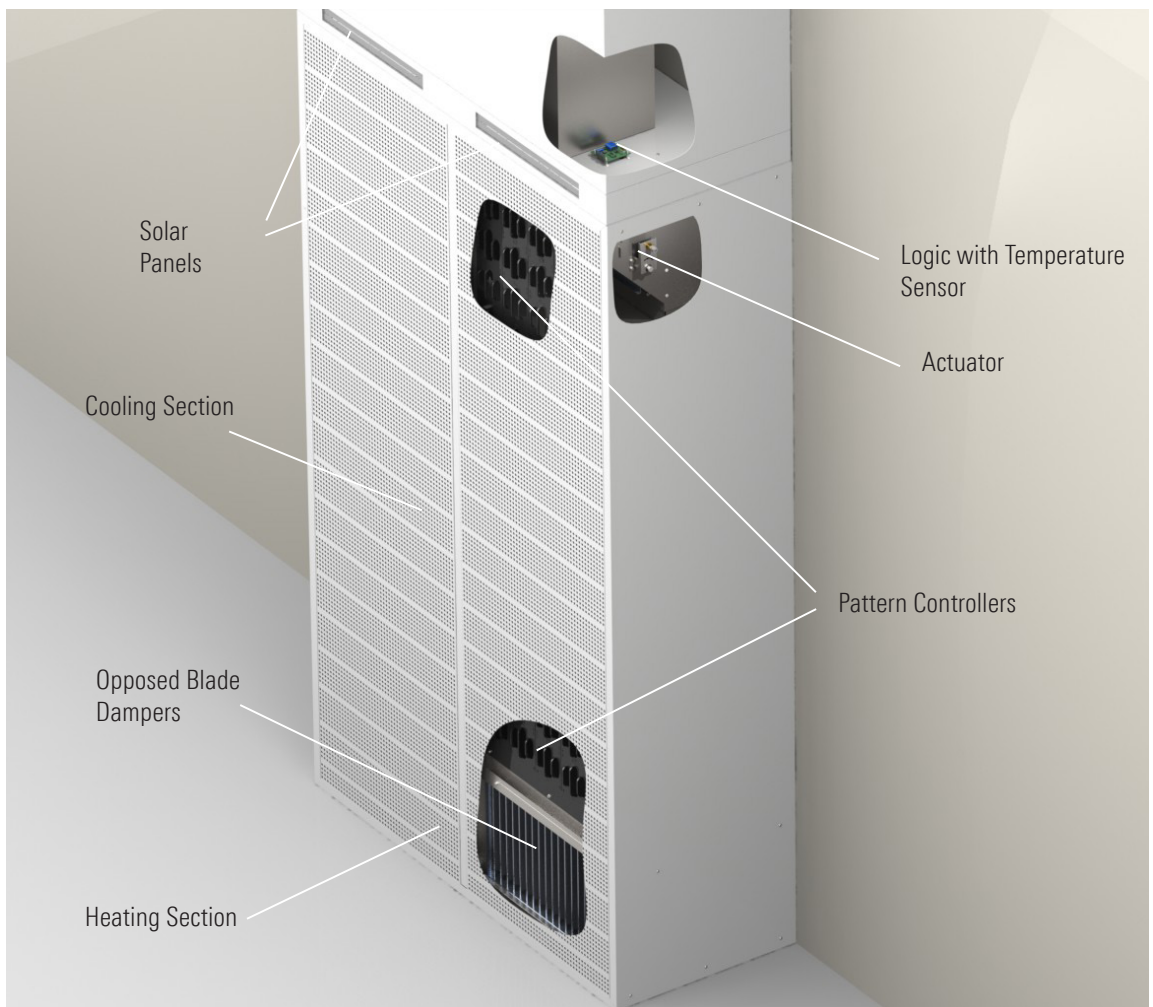
- » Remove diffuser face
- » Remove louvers
- » Reposition louvers
- » Replace face

This unique feature provides a high level of flexibility for the end user. They can react to changes in the space by adjusting the adjacent zone rather than disconnecting and moving the diffuser.



Adjusting the air pattern controllers

The innovative design of the Solar Plexicon created an energy-efficient HVAC unit that will revolutionize the industry. Cooling and heating that comes from a device that requires no external power source will save building owners hundreds of thousands of dollars over the life cycle of their new or renovated building.



LEED Credits

LEED CREDITS available via DISPLACEMENT VENTILATION SYSTEMS

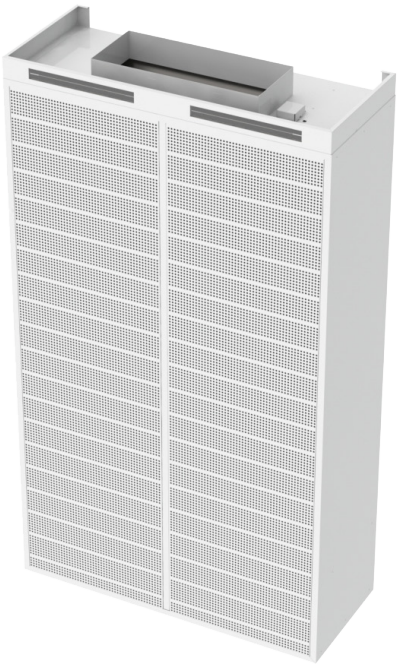
ENERGY AND ATMOSPHERE

Credit 1: Optimize Energy Performance

INDOOR ENVIRONMENTAL QUALITY

Credit 2: Increased Ventilation

Credit 7.1: Thermal Comfort - Design

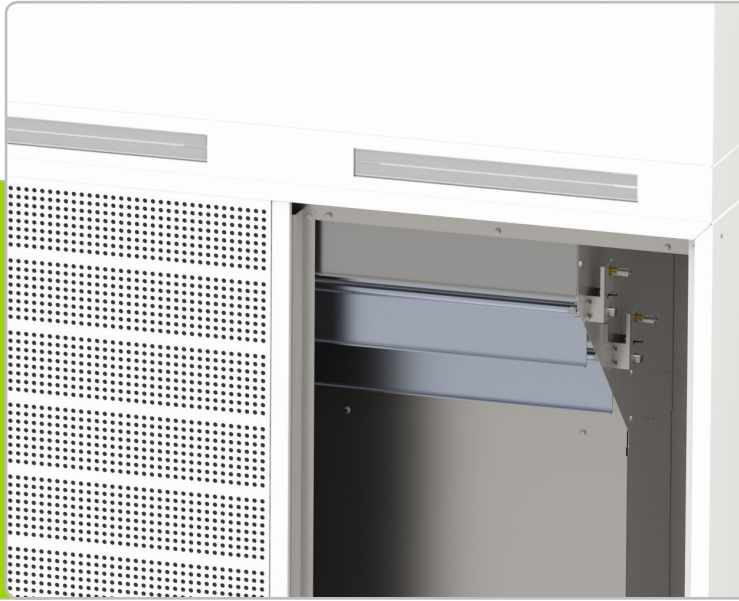


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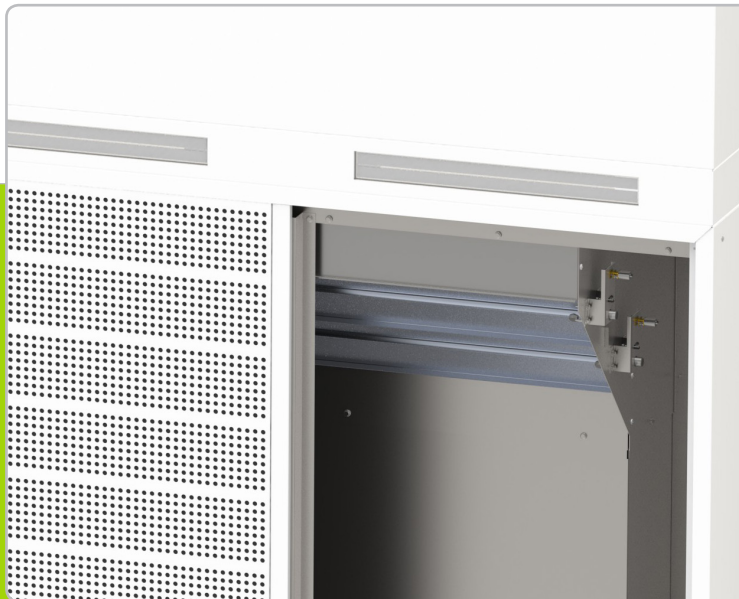


Cooling & Heating Modes – A Closer Look

COOLING MODE



HEATING MODE

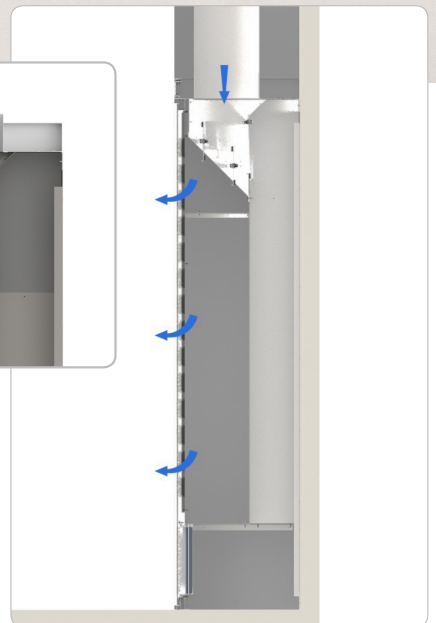
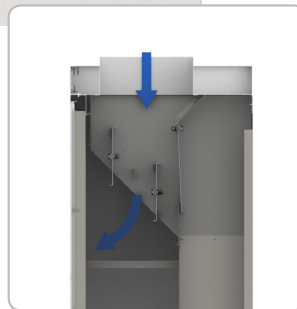


Cooling Mode



HOW COOLING WORKS IN THE SOLAR PLEXICON

In cooling mode, cool air is directed to travel straight down and come out of the top portion of the face of the diffuser via the adjustable air pattern controllers. Cool fresh air then enters the occupied zone and provides comfort.

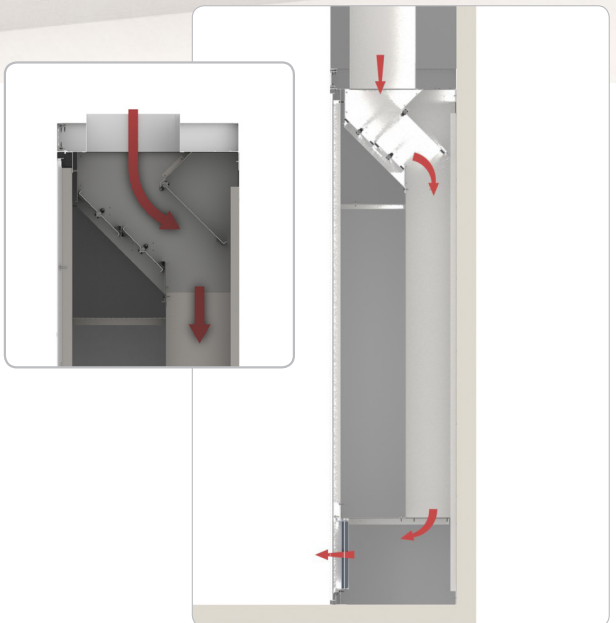


Heating Mode



HOW HEATING WORKS IN THE SOLAR PLEXICON

In heating mode, warm air is directed to travel down pass the adjustable air pattern controllers toward the bottom portion of the face of the diffuser and leave via the opposed blade dampers. Warm air then enters the occupied zone to provide comfort.



Icons



supplies both heating and cooling from one air device

dual-function



finish options that resemble wood grains, perfect for high-profile architectural applications

wood grains



energy-harvesting & savings feature of an HVAC device powered by ambient light

light powered



contributes toward energy savings by reducing operating costs of air distribution devices

energy solutions



unit contains smart logic mechanism enabling it to adjust the temperature band between heating & cooling

smart logic

Notes



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PLEXICON

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