

AUDITORIUM STEP SWIRL DIFFUSER



DESCRIPTION

The SMARTEMP® Auditorium Step Swirl Diffuser, type CSS-FD (figure 1), discharges supply air in a fixed radial discharge pattern. The diffuser is mounted in the vertical face of auditorium steps. Highly inductive swirl discharge directed away from the sensitive ankle regions of seated occupants strongly dilutes the supply air stream with room air and rapidly breaks down the discharge velocity. This ensures draught-free air supply for displacement airflow in tiered auditoria, providing occupants with enhanced levels of thermal comfort and increased indoor air quality.

The CSS-FD diffuser is well suited to steeply raked auditoria, such as sports arenas. The radial discharge supply air pattern attaches to each vertical step face, stabilising the lake of cool displacement air at ankle height above the floor tiers. This prevents the cool displacement air from cascading down the steps, thereby preventing draughts at ankle height, and ensuring that the displacement cooling effect is also retained at higher tier levels rather than accumulating in a waterfall effect that overcools the front tiers.



Figure 1

Auditorium Step Swirl Diffuser
CSS-FD : 092018

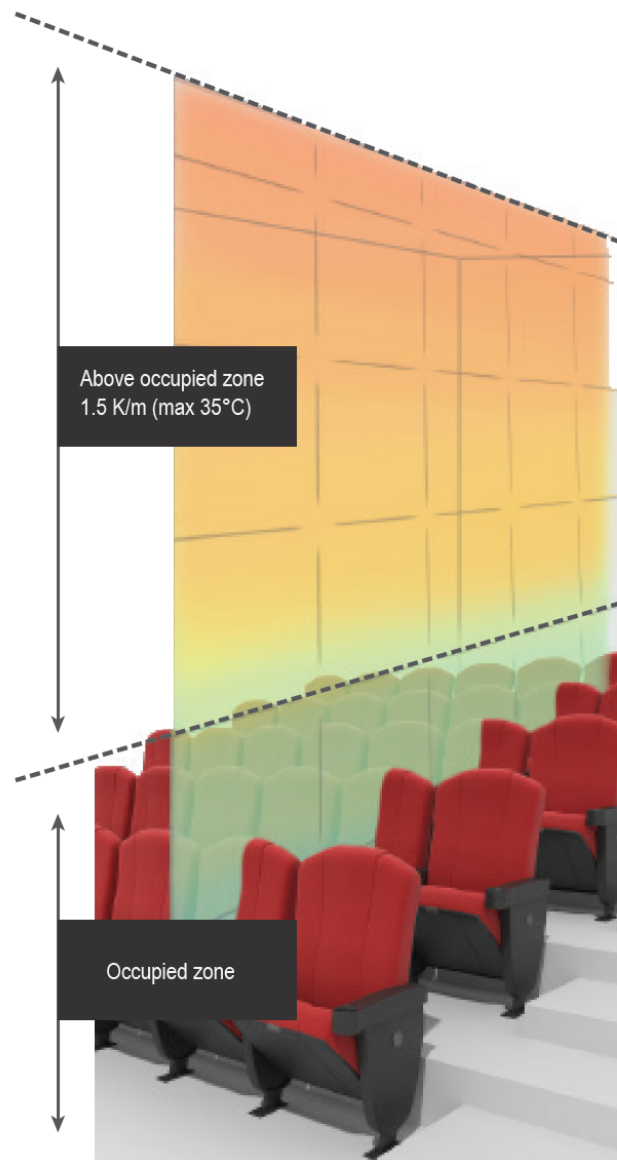


Figure 2

The low level lake of cool, high quality air is drawn up to envelope each occupant as thermals created by occupants' body heat rise by natural convection. Heat and contaminants are displaced by the low level replenishment displacement air to a high level stratified layer beneath the ceiling, to be removed from the space. Occupants are cocooned in a microclimate of enhanced indoor air quality and superior thermal comfort.

Due to stratification of heat, relatively large supply-to-return temperature differentials are achievable – dependent on ceiling height – despite the relatively high supply air temperature (typically 17-18°C), thereby minimising fan energy.

Energy savings also accrue from the extended free cooling range typically achieved by the elevated supply air temperature, as well as from the potential to reduce outdoor airflow rates due to the enhanced indoor air quality resulting from the improved ventilation effectiveness of the low level displacement supply.

Installation

The diffuser can be installed into timber or concrete steps from the step front. For timber steps, we recommend to firstly secure the hood with tapping screws (7, by others) into the timber cut-out. Then the twist element (1) can be fastened into the hood with the threaded rod (5) provided. For concrete steps, the hood can be inserted into the penetration and secured with construction adhesive. The swirl element is to be fastened into the hood after the adhesive has fully cured.



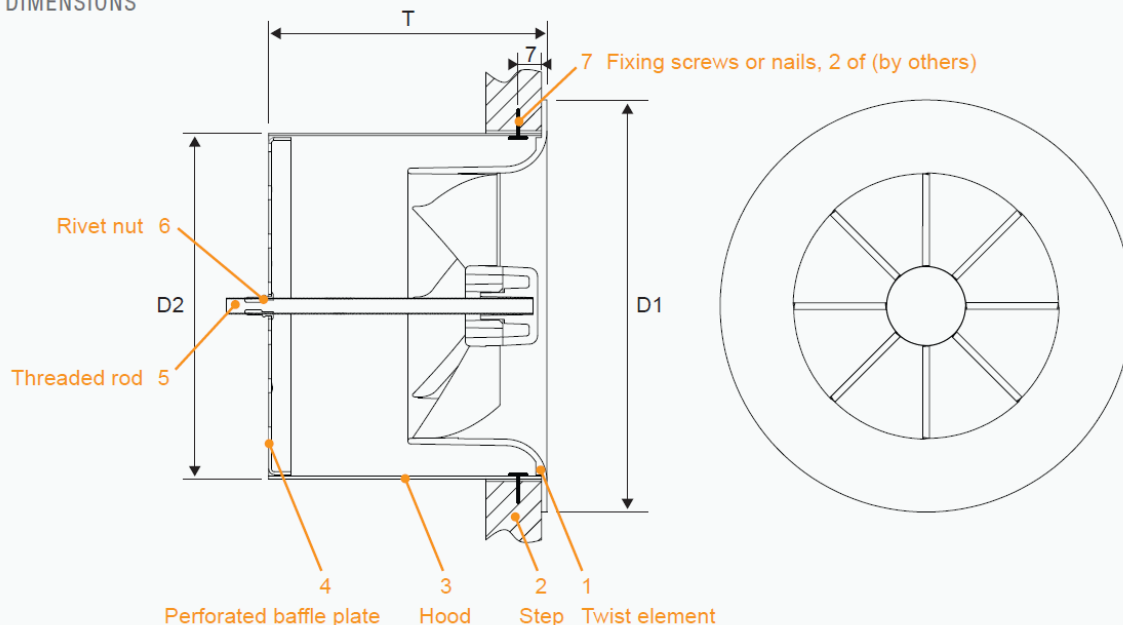
Figure 3

Auditorium Step Swirl Diffuser
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TECHNICAL DATA

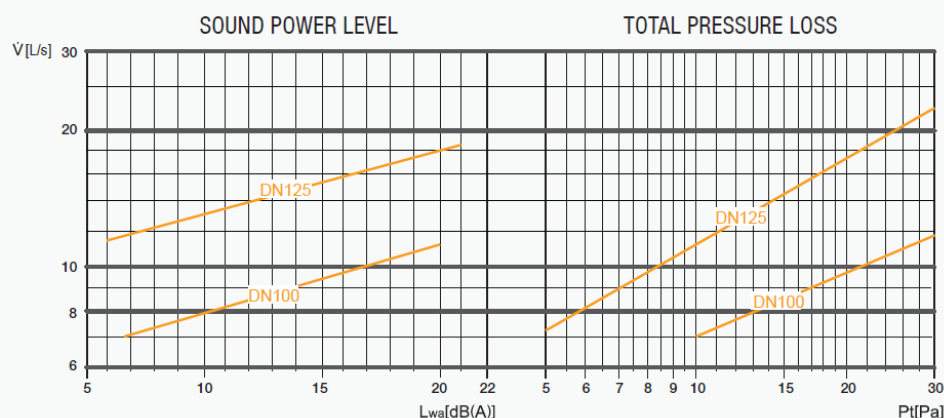
DIMENSIONS



Nominal Size	D1 [mm]	D2 [mm]	Recommended cut-out diameter [mm]	T [mm]
DN100	∅ 148	∅ 124	126	100
DN125	∅ 186	∅ 176	178	110

Products supplied may differ slightly from those described in this technical brochure due to on-going product development.

PERFORMANCE



Note: The pressure drop of the diffuser unit can be increased or decreased on request so that for example, the air flow rate to the rear rows of the tiered seating is greater than to the other rows in the space, based on air supply from a common plenum.

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ORDER DETAILS

CSS-FD-____-____

COLOUR:
- RAL____(RAL9005 Jet Black standard)

SIZE:
- DN100
- DN125

MODEL:
- Circular Swirl Step - Fixed Direction

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TENDER TEXT

The SMARTEMP Auditorium Step Swirl Diffuser, type CSS-FD, shall be constructed with a perforated baffle plate behind the operative diffuser face to create a uniform, low velocity distribution of supply air across the swirl blades. The diffuser face shall be removable, without requiring access from behind, for cleaning. The discharge face shall be constructed of high-impact plastic. The internal baffle elements shall be constructed of perforated sheetmetal.

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