

PRODUCT BROCHURE

SMARTEMP[®]
IN COMFORT



Adjustable Radial Plug-Flow Diffuser

RPC-AD

RPC-AD : 012021

smartemp.com

DESCRIPTION

The SMARTEMP® Radial Plug-flow Diffuser, type RPC-AD, is a round ceiling displacement diffuser used in industrial applications to produce a stable plug-flow air pattern from 4 m to 8 m discharge height that purges contaminants from the downward path of the diffuser air stream in a piston-like fashion (rather than removing these by dilution, as would occur with mixed airflow). The direction of discharge is manually adjustable (optionally by electric or thermal actuator).

Mode of Operation

Supply air, at a supply-to-room temperature differential of up to -6 K in cooling mode, and up to +8 K in heating mode, is discharged from a perforated face with minimal mixing, to produce a relatively low velocity plug-flow air stream. Spot cooling/heating and contaminant purging occur in the airstream path. When set to horizontal discharge, suitable for cooling at -6 K, the air pattern spreads radially before falling gently in a non-turbulent manner to purge contaminants in its path. When set to vertical discharge, suitable for heating at +8 K, the air stream is directed strongly downwards to the floor.

In cooling mode (figure 1), the adjustable damper is closed, producing a plug-flow of air that spreads radially before gently flowing vertically downwards, displacing contaminants from its path and allowing heat to rise upwards.

For heating (figure 2), a pilot jet is generated via an adjustable damper integrated into the core tube. This pilot jet adjusts the discharge direction of the combined supply air stream vertically downwards, providing sufficient momentum to push the warm and buoyant supply air to floor level.

Discharge adjustment may be manual, by means of a thermal wax element in the supply air stream (no external power source required), or by an electric actuator.

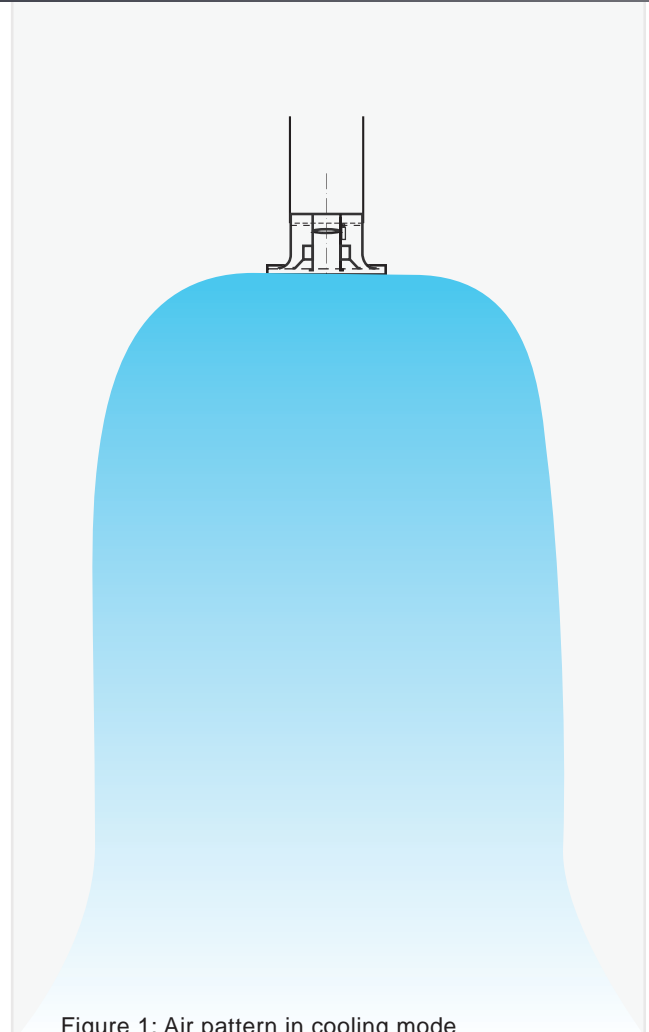


Figure 1: Air pattern in cooling mode

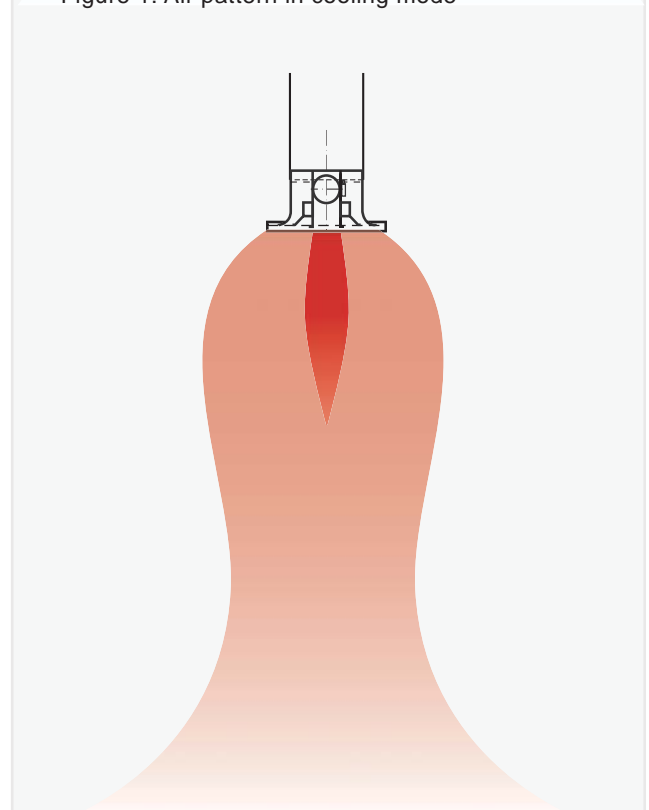
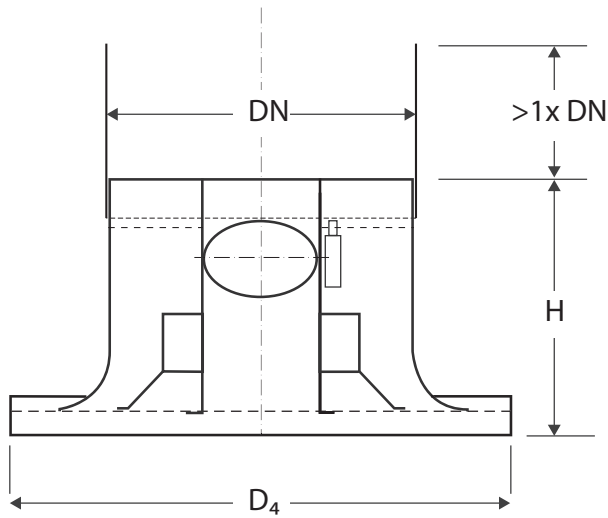


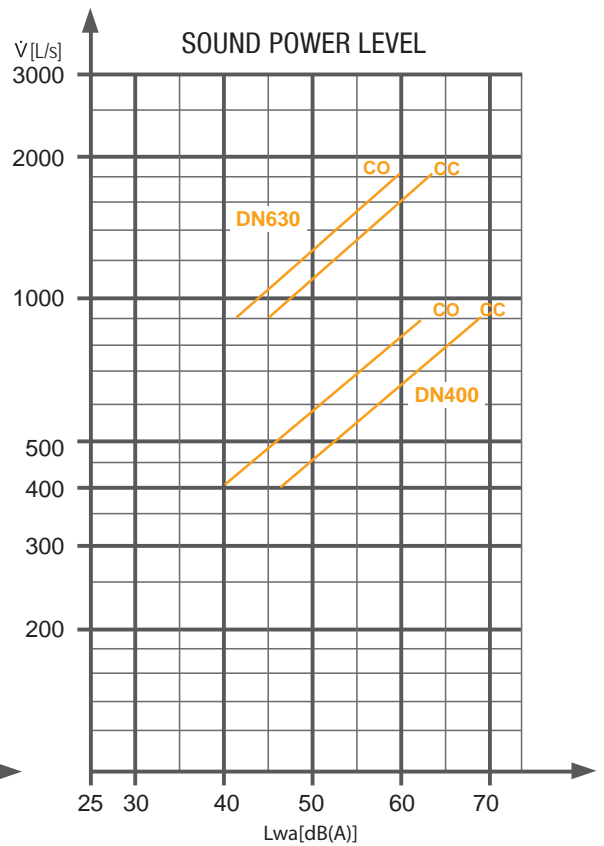
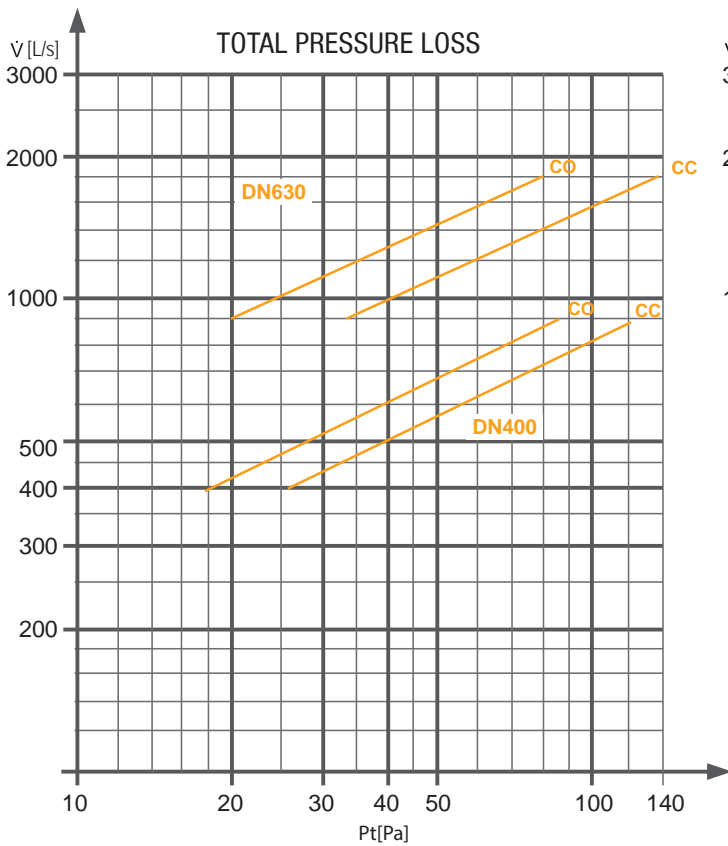
Figure 2: Air pattern in heating mode

TECHNICAL DATA



DIMENSIONS

Nominal Size	Face Dimension D ₄ [mm]	Height H [mm]	Actual Neck Diameter [mm]
DN400	700	320	398
DN630	1050	490	628



TECHNICAL DATA

Nominal Size	Volume flow rate: Min - Max [L/s]	Installation Height [m]
DN400	450 - 900	4.5 - 7.0
DN630	900 - 1800	5.0 - 8.0
Recommended ΔT : -6 K (cooling); +8 K (heating)		



Figure 3: Smoke test in cooling

Adjustment to the thermal load

The adjustment of the air outlet to heating or cooling mode is made either manually or by an actuator. Manual adjustment is by means of a control lever on the diffuser. Because access to ceiling diffusers is difficult, manually adjustment is usually chosen in cooling only applications.

Actuator adjustment can be realised by an electric servomotor or by a thermally powered self-acting thermostatic control unit. The advantage of the latter is that there is no need for electric wiring and controls.



Figure 4: RPC-AD with electric actuator

ORDER DETAILS

RPC-AD-DN____-____-____

SURFACE FINISH:

- 9003* = Face powder coated to RAL 9003 (Signal White)
- 9005 = Face powder coated to RAL 9005 (Jet Black)
- 9006 = Face powder coated to RAL 9006 (Aluminium)
- _____ = Face powder coated to RAL _____

ADJUSTMENT:

- M* = Manual adjustment only
- E1 = With electric actuator 24V, 2-10V
- E2 = With electric actuator 24V, 3-pt (2-position)
- T_____ = With thermal actuator

NOMINAL DIAMETER:

- DN400 = Nominal neck diameter 400 mm
- DN630 = Nominal neck diameter 630 mm

MODEL:

- Radial Plug-flow Ceiling Diffuser - Adjustable Direction

Note:

* Standard, if no type code entered.

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



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