

Product manual

Displacement diffuser

SD-H

Air distribution

Version 1.0.0
Date: 27.06.2024.

PRODUCT OVERVIEW

Displacement air outlets enable to extract pollutants from production and work areas efficiently and without substantial mixing with indoor air. Depending on both the type of pollutants and the specific internal heat load, the displacement outlets are placed either above the occupied zone or on the floor. Thus low pollutant and heat load factors can be achieved (1). The circular displacement outlet with adjustable damper is eminently suited for installation above the occupied zone or on the floor. The air discharge direction can be adjusted from a slight incline upwards to vertically downwards; this enables to get a constantly ideal indoor air flow despite varying internal heat gains. If the outlet is placed at about 3 m height, a pollutant load factor of 55 to 57% can be achieved (against 90 to 100% with turbulent mixing ventilation), depending on the outlet setting. If it is placed on the floor, the pollutant load factor is as low as about 20%. Such values can be reached only with displacement outlets whose discharge direction can be adjusted, as is the case with the circular displacement outlet with adjustable damper described here. The heat load factor is low too: about 65% with the outlet at 3 m height, and about 45% with the outlet on the floor.

Klimaoprema supplies different systems for adjusting the outlet damper: three manual options, an electric servomotor as well as which controls the damper, and thus the air discharge direction, in response to the difference in temperature between the supply and indoor air – without auxiliary energy.



▼ DIFFUSER

▼ ORDERING KEY

PRODUCT CALCULATION SOFTWARE

PRODUCT OVERVIEW

Ød X H	750	1000	1250	1500
250				
315				
355				
450				
560				
630				

Size	Volume flow rate for placement												Weight
	at 3 m height				on the floor				Dimensions				
	V_A min		V_A max		V_A min		V_A max		$\varnothing D_A$	H	H_1	T	
\varnothing	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	mm	mm	mm	mm	kg
250	195	700	475	1700	140	500	330	1200	249	900	765	180	10
315	305	1100	725	2600	220	800	475	1700	314	900	765	212	11
355	415	1500	975	3500	305	1100	670	2400	354	1100	965	232	12
450	695	2500	1530	5500	485	1750	1055	3800	449	1100	965	280	14
560	1055	3800	2220	8000	750	2700	1550	5600	559	1100	965	335	18
630	1400	5000	2800	10000	970	3500	1950	7000	629	1100	965	370	21

▼ DIFFUSER

▼ ORDERING KEY

PRODUCT CALCULATION SOFTWARE

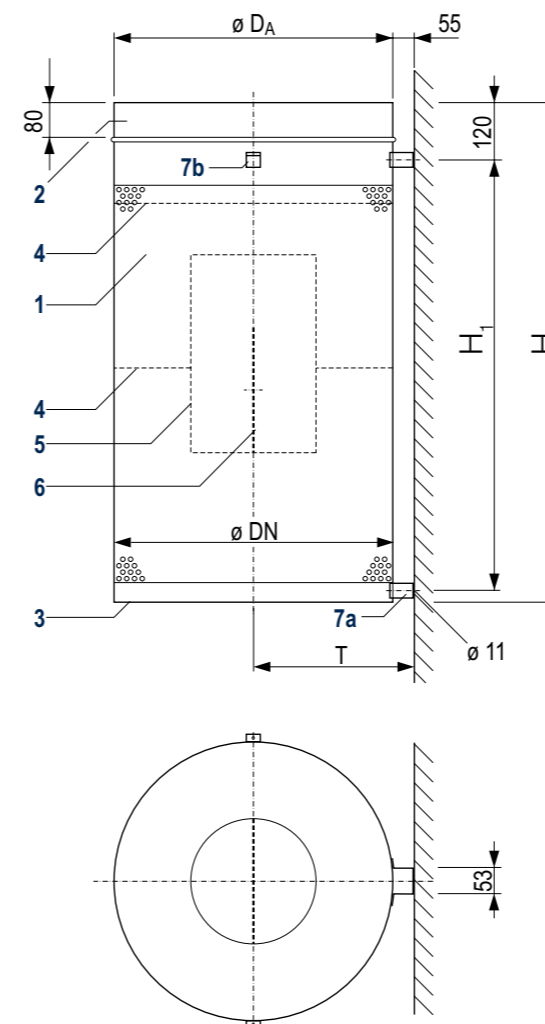
Pollutant load factor = ratio of pollutant concentration at the workplace to pollutant concentration in the return air, in %.
Heat load factor = ratio of heat load at the workplace to total heat gains, in %.

Design and function

The main components of the circular displacement outlet with adjustable damper are the perforated cylinder 1 with connection spigot 2 and plain bottom 3, the orifice rings 4, and the air deflection tube 5 with built-in adjustable damper 6. The outlet is made of galvanized sheet metal.

Owing to its particular design the perforated cylinder generates a low-turbulence displacement flow around the air outlet.

1. Perforated cylinder
2. Connection spigot
3. Bottom
4. Orifice ring
5. Air deflection tube
6. Adjustable damper
- 7a. Fastener for wall mounting (option)
- 7b. Two opposite L-fasteners (option)



PRODUCT OVERVIEW

INSTALLATION

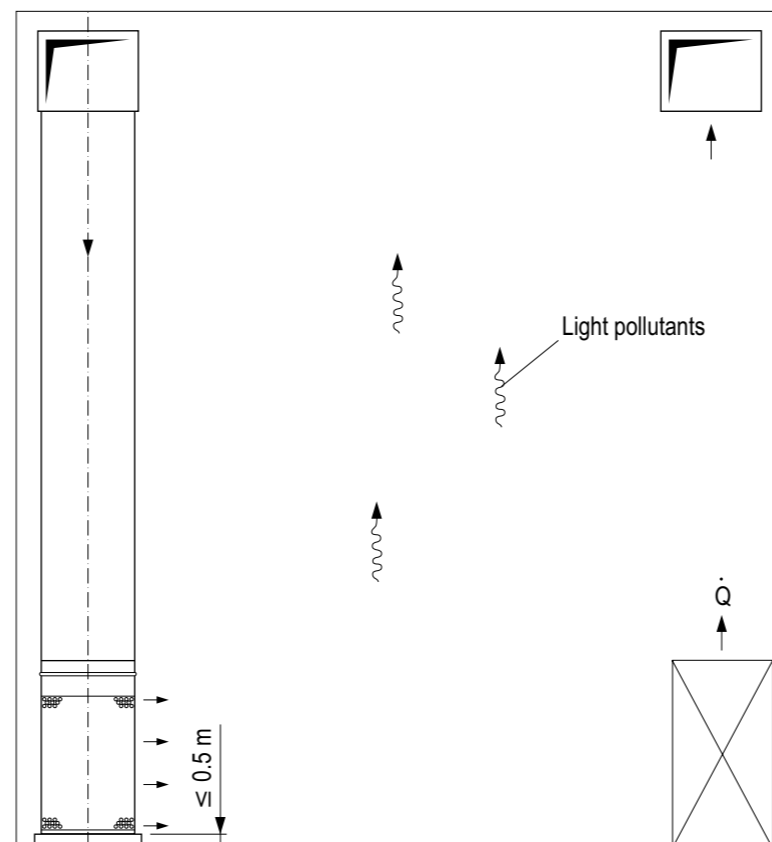
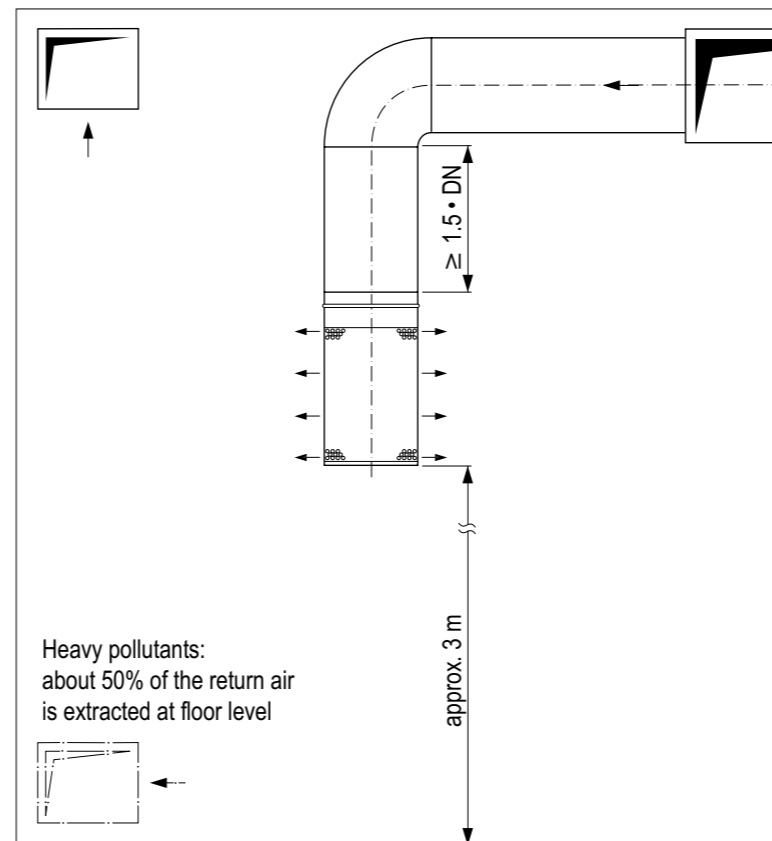
The air outlet can be placed either above the occupied zone or on the floor, anywhere in the room or in front of a wall or pillar.

1.Placement above the occupied zone

In spaces with low specific heat loads or where heavy pollutants are released, the air outlets are best placed above the occupied zone. The air is supplied from above. The recommended discharge height is 3 m (underside of air outlet). The removal of heavy pollutants is facilitated by the extraction of about 50% of the return air at floor level. The purpose of the built-in damper is to adapt the air discharge direction to the cooling or heating mode. In work areas where heat loads vary heavily, the best way of adjusting the damper is using an electric servomotor or a thermal control unit. In other cases manual adjustment will be adequate, using a Bowden cable or a chain pull which will be operated from the occupied zone.

2 Placement on the floor

This arrangement is best suited either for removing high specific heat loads ($q_v > 120 \text{ W/m}^2$) or where light pollutants are released. The direction of the supply air jets supports the buoyancy forces and helps convey the light pollutants away to the return air ducts. The air outlet can be placed either directly on the floor or on a customer supplied base having a maximum height of 0.5 m. For this arrangement the outlet has a finely perforated cylinder and the maximum air flow rate is 30% less than for placement at 3 m height. The air discharge direction is usually adjusted manually, using a control lever positioned on the outlet surface. Yet if self-adjustment is preferred, it is advisable to use a thermal control unit.



PRODUCT
CALCULATION
SOFTWARE

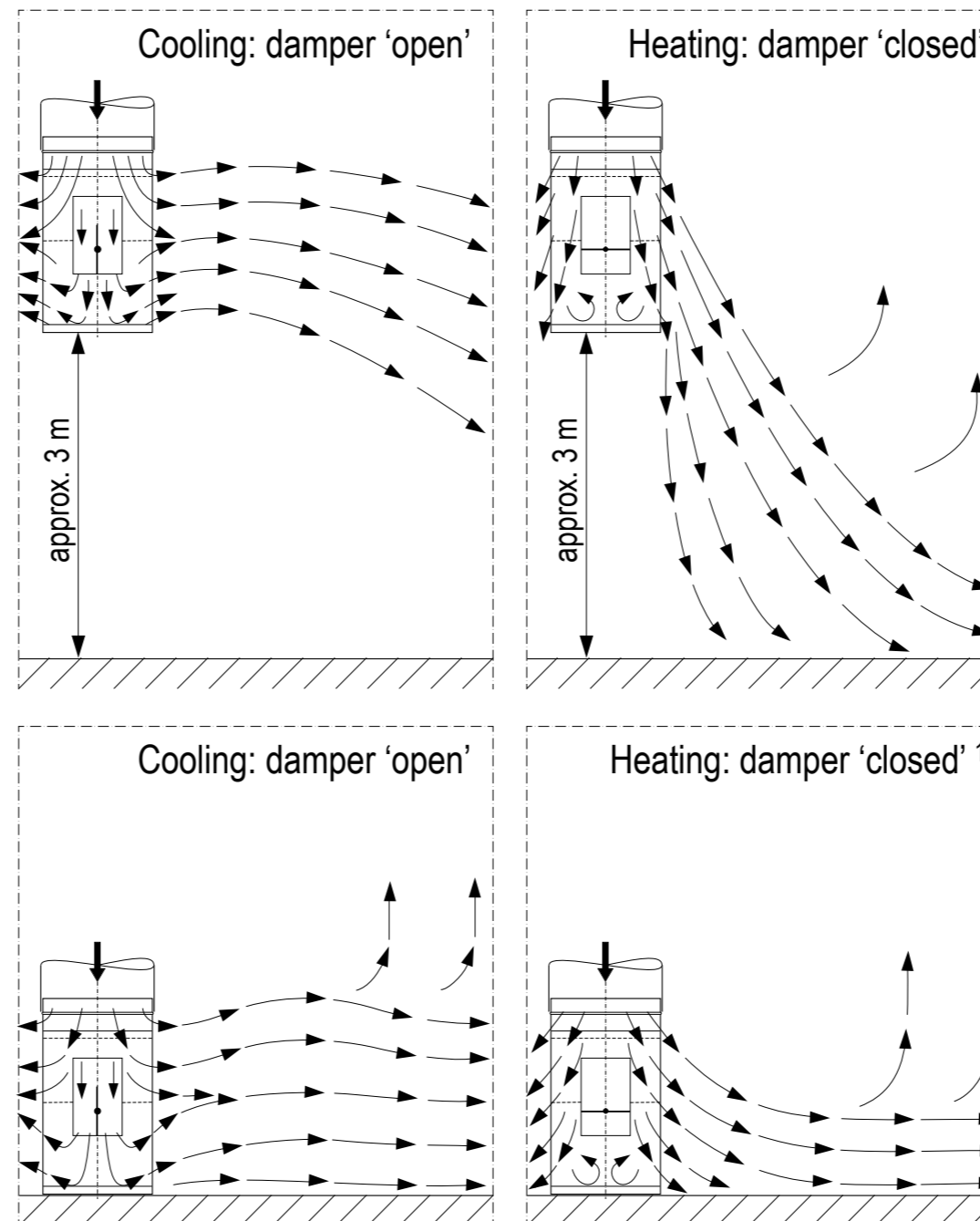


INSTALLATION

DISPERZIJA ZRAČNOG MLAZA

Cooling mode: With the adjustable damper open, a partial volume of air gets through the deflection tube to the outlet bottom where it is deflected before being discharged slightly upwards. This lifts the complete air stream and increases the height of the supply air layer. Whether the outlet is placed above the occupied zone or on the floor, an even low-turbulence displacement flow builds up around the air outlet, with a large penetration depth into the occupied zone.

Heating mode: In low-turbulence displacement ventilation, if the supply air temperature is above the room temperature (when heating), the discharge flow is affected by more or less strong buoyancy forces; as the supply air starts moving upwards too early it cannot achieve the required penetration depth. The case is different with the Klimaoprema circular displacement outlet! Its built-in air deflection device enables to offset the buoyancy forces: with the damper closed, the outlet generates a radial downflow which counters the buoyancy forces of the warm supply air that can thus penetrate deep into the room.



▼ DIFFUSER

▼ ORDERING KEY

PRODUCT CALCULATION SOFTWARE

PRODUCT OVERVIEW



▼ DIFFUSER

▼ ORDERING KEY



PRODUCT
CALCULATION
SOFTWARE



Ordering key SD-H

(1) Diffuser (2) Size (3) Actuator (4) RAL (5) Accessories

SD-H - **250x750** - **M24** - **RAL** - **H**

(1) Diffuser **SD-H**

(2) Size: **Ød x H**

(3) Actuator:
M24 - electric actuator AC/DC 24 V
M230 - electric actuator AC230 V

(4) **RAL**

(5) **O** - none
H - fasteners for wall mounting




ORDERING KEYS



AIR DISTRIBUTION

Projektiranje, proizvodnja i održavanje opreme za klimatizaciju, ventilaciju i čiste prostore.
Design, production and service of Ventilation, Air-Conditioning and Cleanroom equipment.

-  Gradna 78A, 10430 Samobor, Croatia
-  +385 (0)1 33 62 513
-  info@klimaoprema.com
-  www.klimaoprema.com