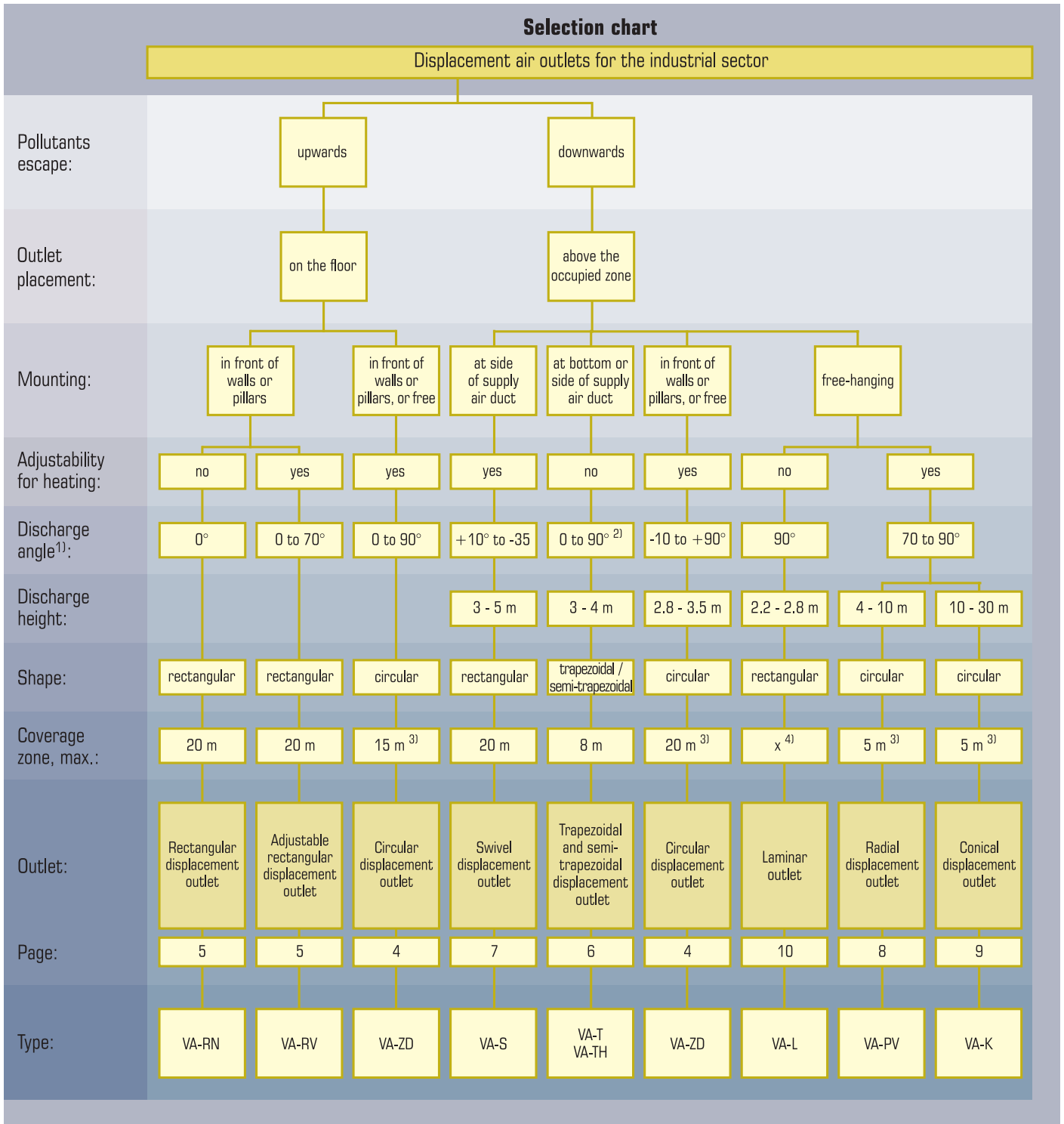




Displacement air outlets

Low-turbulence air flow
in the industrial sector

Displacement air outlets for the industrial sector

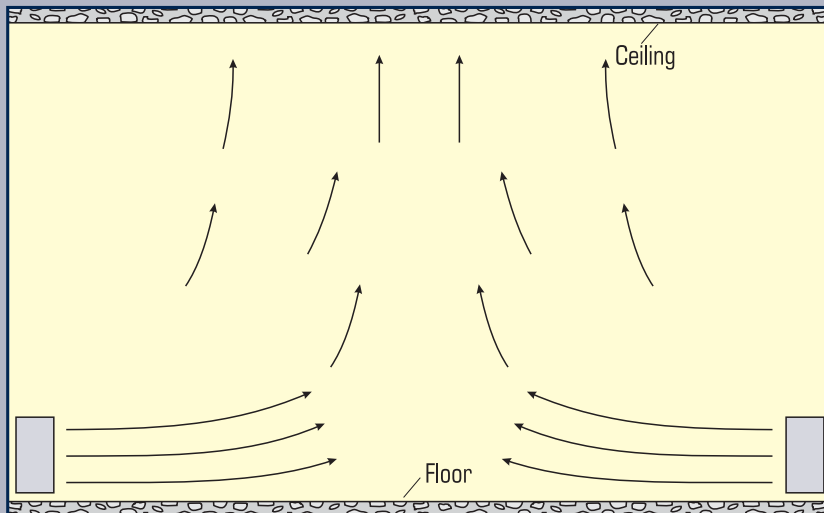


¹⁾ To horizontal (downwards +, upwards -)

²⁾ Discharge ranging from horizontal to vertical

³⁾ Coverage radius

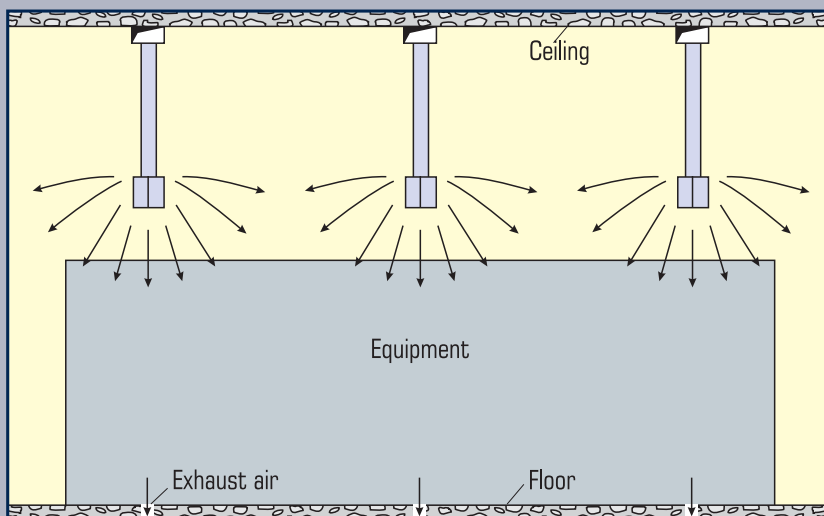
⁴⁾ Coverage zone only below the outlet



Displacement air outlets discharge supply air at low velocity and low momentum. They generate a large number of thin, adjacent air jets that have a much lower induction effect than is the case with turbulent mixing air flow.

The indoor air mixes less with the fresh supply air. The jet bundle displaces the pollutants and heat from the occupied zone to the exhaust air system. The result is high air quality with low concentration of pollutants and heat in the work zones.

The displacement air outlets are eminently suitable for production halls with significant pollutant emission or high specific heat loads.



KRANTZ KOMPONENTEN provides displacement air outlets for all kinds of applications:

- Efficient removal of heavy or light pollutants
- Adjustable outlets for both cooling and heating
- Air outlets for installation on the floor, in front of walls, or above the occupied zone
- Air outlets to ensure extensive room coverage or to protect individual work-places

Low-turbulence displacement air flow

Circular displacement outlet Type VA-ZD

For rooms where the supply air is discharged at individual points. Placement at about 3 m height or directly above the floor.

This air outlet is adjustable. The built-in air guiding device enables to steplessly alter the discharge direction from a slight upward incline to vertical downflow. The air outlet is therefore well suited for both cooling and heating. When cooling, the supply air is preferably discharged horizontally to slightly upwards; when heating, it is discharged downwards.

Outlet adjustment by hand or via built-in servomotor or thermal control unit (in response to temperature difference between supply air and indoor air).

Placement free-hanging or free-standing in room, or in front of a pillar or wall.

Features:

- Low-turbulence displacement flow
- Placement at about 3 m height or directly above the floor, anywhere in the room or in front of a pillar or wall
- Radial discharge
- Stepless alteration of discharge direction from nearly horizontal to vertical down-flow
- Adjustment by hand or via servomotor or thermal control unit
- Well suited for cooling and heating
- Connection to ducts to DIN 24145

Technical layout to DS 4059



Circular displacement outlet, type VA-ZD

Applications:

Foundries, press works, metal cutting plants, dye shops, galvanization shops, etc.

Volume flow rate range:	$\leq 2\,800\text{ l/s}$ $\leq 10\,000\text{ m}^3/\text{h}$
Sizes:	DN 250 to DN 630
Max. coverage zone:	20 m
Max. temperature difference supply air – indoor air ¹⁾ :	$\pm 10\text{ K}$

¹⁾ Indoor air in the occupied zone

Air jet pattern of VA-ZD
Cooling mode



Heating mode



Circular displacement outlet, type VA-ZD, in a production hall of VW at Emden / D



Circular displacement outlet, type VA-ZD, on the floor of the production hall of 'Stihl & Co.' at Wil / CH

Rectangular displacement outlet Types VA-RN and VA-RV

For rooms with high specific heat loads or light pollutants.

The air outlet is available in adjustable or non-adjustable design.

The non-adjustable type (VA-RN) discharges the supply air horizontally. If the supply air is colder than the indoor air, it flows in a layer close to the floor - due to gravity - and deep into the room.

The adjustable type (VA-RV) has a built-in air guiding device that enables to discharge the supply air towards the floor when heating in order to prevent an early upflow of the warmer supply air.

Placement on the floor, close to a wall or parapet. Several air outlets can be arranged in a row side by side.

Features:

- Low-turbulence displacement flow
- Installation on or directly above the floor
- Adjustable type (VA-RV) or non-adjustable type (VA-RN)
- Horizontal discharge; with the adjustable type (VA-RV) discharge towards the floor when heating
- Flat shape
- Rectangular spigot positioned on top

Applications:

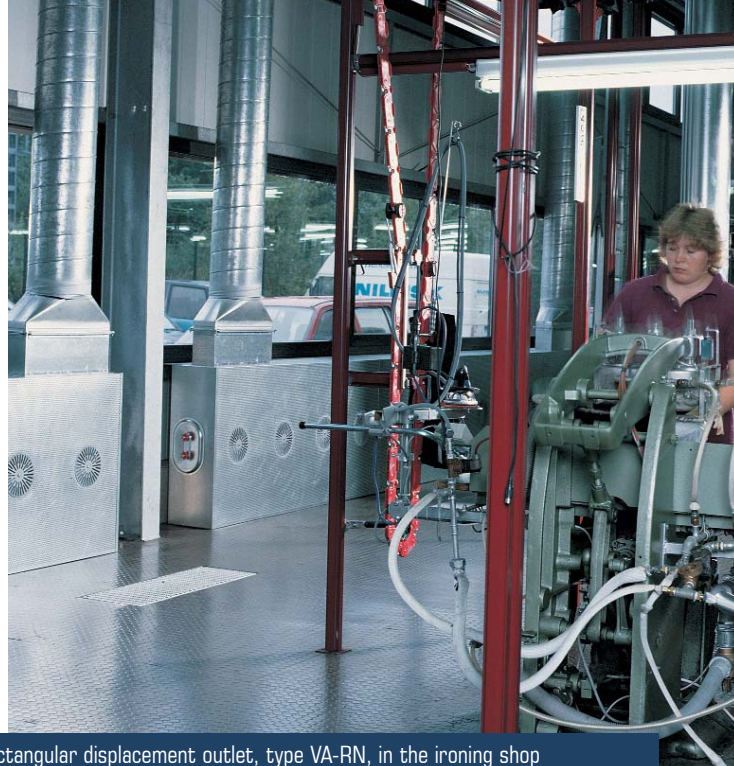
Printing shops, foundries, laundries, ironing shops, dye shops, etc.

Technical layout to DS 4009

Volume flow rate range:	$\leq 700 \text{ l/(s} \cdot \text{m)}$ $\leq 2\,500 \text{ m}^3/\text{(h} \cdot \text{m)}$
Lengths:	1.0 to 2.5 m
Coverage zone:	$\leq 20 \text{ m}$
Max. temperature difference	-8 K when cooling supply air – indoor air ¹⁾ : +6 K when heating ²⁾

¹⁾ Indoor air in the occupied zone

²⁾ Only for VA-RV



Rectangular displacement outlet, type VA-RN, in the ironing shop of 'Bianca Moden' at Ochtrup / D



Rectangular displacement outlet, type VA-RV

Air jet pattern of VA-RV
Cooling mode



Heating mode



Rectangular displacement outlet, type VA-RN, in the printing shop of 'Frankfurter Societät' at Mörfelden / D

Trapezoidal displacement outlet

Type VA-T

Semi-trapezoidal displacement outlet

Type VA-TH

For plants with airborne dust, aerosols or fibres, and permanent cooling.

The supply air is discharged out of the perforated casing surface in an umbrella shape, in directions ranging from horizontal to inclined and vertical (downwards). Wider trapezoidal displacement outlets are fitted with twist outlets that stabilize the jet bundle. A stable flow is generated which displaces the heavy particles towards the floor. So the solid particles remain in the indoor air for a short time only.

The air outlet is installed at the bottom or side of a supply air duct, as a rule several in a row. It can be placed flush with the ceiling or free-hanging.

With a covered discharge segment or in semi-trapezoidal design, the air outlet can also be placed in front of a wall.

Technical layout to DS 4010

Features:

- Low-turbulence displacement flow
- For applications with permanent cooling
- Discharge height: 3 to 4 m

Type VA-T

- Installation directly below a supply air duct, as a rule several in a row
- Umbrella-shaped discharge in directions ranging from horizontal to inclined and vertical (downwards)
- Can be placed in front of a wall if a lateral discharge segment is covered
- Air discharge element can be pulled down for cleaning
- With volume flow damper

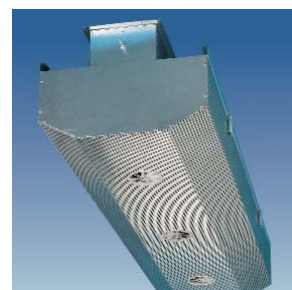
Type VA-TH

- Installation along a wall or pillar row; air supply via rectangular or circular spigot positioned on top or at rear
- Half-umbrella-shaped discharge in directions ranging from horizontal to inclined and vertical (downwards)

Applications:

Textile industry, paint shops, laboratories, printing shops, etc.

Trapezoidal displacement outlet, type VA-T



Semi-trapezoidal displacement outlet, type VA-TH



Semi-trapezoidal displacement outlet, type VA-TH, in the 'NDK' printing shop of the Axel Springer publishing house, Essen / D



Trapezoidal displacement outlet, type VA-T, in the weaving mill of 'Verseidag' at Viersen / D



Air jet pattern of VA-T



Air jet pattern with outlets placed in front of a wall

		Type VA-T	Type VA-TH
Volume flow	l/(s · m)	85 – 695	70 – 415
rate range:	m³/(h · m)	300 – 2500	250 – 1 500
Air outlet widths:	mm	140, 290 and 500	250 and 500
Air outlet lengths:	mm	800, 1 250, 1 600 and 1 800	1 200, 1 500 and 1 800
Coverage zone of supply air jets:	m	4 – 8	2 – 3
Temperature difference supply air – indoor air:	K	–3 to –8	–3 to –6

Swivel displacement outlet Type VA-S

For plants where the supply air ducts with the laterally built-on air outlets must be installed along walls, and where the air is to be supplied to the occupied zone with a large penetration depth.

The supply air is discharged by the perforated rectangular discharge surface; built-in twist outlets stabilize the supply air jet bundle. The air distribution element can be swivelled by 45°, so the air outlet is well suited for both cooling and heating. When cooling, the standard discharge direction is 10° upwards from horizontal; when heating, it is at a downward incline of up to 35° to horizontal.

Adjustment by hand or by servomotor.

The discharge height ranges between 3 and 5 m.

Features:

- Low-turbulence displacement flow
- Placement above the occupied zone, in front of walls or galleries
- Discharge height: 3 to 5 m
- Adjustment of discharge direction possible from +10° to -35° to horizontal, manually or with servomotor
- Placement at side of supply air duct, singly or several in a row

Applications:

Press works, printing shops, galvanization shops, vulcanization plants, etc.

Technical layout to DS 1276

Swivel displacement outlet, type VA-S



Air jet pattern of VA-S
Cooling mode



Heating mode



Volume flow rate range:	280 – 420 l/(s · m) 800 – 1 800 m³/(h · m)
Lengths:	1.2 m, 1.6 m, 2 m and 2.4 m
Max. coverage zone:	approx. 20 m
Max. temperature difference supply air – indoor air ¹⁾ :	± 8 K

¹⁾ Indoor air in the occupied zone



Swivel displacement outlet, type VA-S, in a production hall of the dairy 'Südmilch AG', Heilbronn / D

Radial displacement outlet

Type VA-PV

For plants where the supply air is to be discharged downwards at low turbulence from a height of 4 to 10 m.

The horizontal, circular, perforated frontal plate generates a low-turbulence downward air jet with a slight spread.

The air outlet is fitted with a core tube which is opened when heating so as to increase the penetration depth of the warm supply air jet. So the air outlet is well suited for both cooling and heating.

The valve disc at the entrance to the core tube is preferably adjusted by a built-in servomotor; manual adjustment is also possible.

The outlet is suitable for installation at 4 to 10 m height. The lower the installation height, the more effectively the occupied zone can be flushed with fresh supply air.

The air outlet is installed free-hanging from the ceiling.

Features:

- Low-turbulence displacement flow
- Placement above the occupied zone at 4 to 10 m height, free-hanging
- Downward discharge with a slight spread
- When heating, amplified jet momentum downwards thanks to core tube opening
- Well suited for cooling and heating
- Adjustment preferably with servomotor; manual adjustment as an option
- Connection to round ducts from the top

Applications:

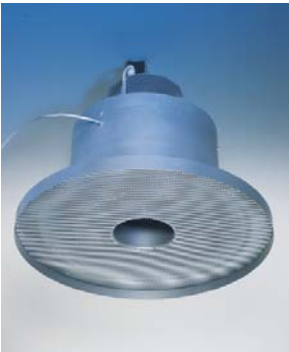
Welding shops, metal cutting plants, press works, aircraft painting hangars, etc.

Technical layout to DS 4061

Volume flow rate range:	280 – 2 200 l/s 1 000 – 8 000 m³/h
Sizes:	DN 315 to DN 710
Max. coverage zone:	5 m ¹⁾
Max. temperature difference supply air – indoor air ²⁾ :	–6 K when cooling +10 K when heating

- ¹⁾ Coverage radius
²⁾ Indoor air in the occupied zone

Radial displacement outlet, type VA-PV



Radial displacement outlet, type VA-PV, in the printing shop of 'Frankfurter Societät', Mörfelden / D



Air jet pattern of VA-PV
Cooling mode



Heating mode

Conical displacement outlet Type VA-K

For halls where the supply air is to be discharged at low turbulence from very great heights.

The supply air is discharged from the truncated cone-shaped perforated frontal plate at low turbulence in a radial pattern. The supply air spreads in an umbrella shape, in directions ranging from horizontal to inclined and vertical (downwards).

When cooling, a stable downflow is generated.

The air outlet is adjustable. When heating, both the core tube and the peripheral annular gap open, which increases the penetration depth of the warm supply air jet. Adjustment occurs via a built-in servomotor.

The discharge height is 10 to 30 m. The air outlet is installed free-hanging from the ceiling.

Features:

- Low-turbulence displacement flow
- Placement at 10 to 30 m height
- Umbrella-shaped radial supply air downflow
- When heating, increased penetration depth of warm supply air by opening of core tube and peripheral annular gap
- Well suited for cooling and heating
- Adjustment via built-in servomotor
- Connection from the top

Applications:

Very high halls, e.g. aircraft maintenance or painting hangars

Volume flow rate range:	2 200 – 2 800 l/s 8 000 – 10 000 m³/h
Size:	DN 1 500
Max. coverage zone:	5 m ¹⁾
Max. temperature difference supply air – indoor air:	–5 K when cooling +10 K when heating

¹⁾ Coverage radius

Technical layout to DS 4011



Conical displacement outlet, type VA-K, in the maintenance and painting hangar of 'Aircraft Services GmbH', Lemwerder / D

Conical displacement outlet, type VA-K



Air jet pattern of VA-K
Cooling mode



Heating mode

Laminar outlet Type VA-L

Used to decontaminate individual workplaces.

Placement above the workplace. The supply air is discharged vertically downwards from the perforated discharge surface at low velocity and extremely low turbulence. Air pollutants and contaminants are displaced from the work zone to the exhaust air intakes.

The outlet dimensions are set in line with the workplace to protect.

The discharge height is preferably 2.2 to 2.8 m. The discharge velocity amounts to 0.15 - 0.4 m/s. The supply air should always be cooler than the indoor air.

Features:

- Placement above the workplace to protect
- Vertical supply air flow with extremely low turbulence
- Stable jet pattern already at air discharge velocities of 0.15 m/s
- Efficient and economical protection of individual workplaces against contaminants
- Also available with side shields to protect against cross convections
- Connection from the top or side

Applications:

Welding workplaces, filling points, sawing workplaces, sorting points, etc.

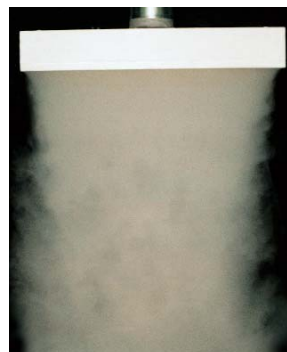
Volume flow rate range:	depending on size
Sizes:	correspond to workplaces
Coverage zone:	directly below the air outlet
Discharge velocity:	0.15 – 0.4 m/s
Temperature difference supply air – indoor air:	–1 to –3 K

Technical layout to DS 4056

Laminar outlet,
type VA-L



Laminar outlet, type VA-L, at a paint touch-up workplace



Air jet pattern of VA-L

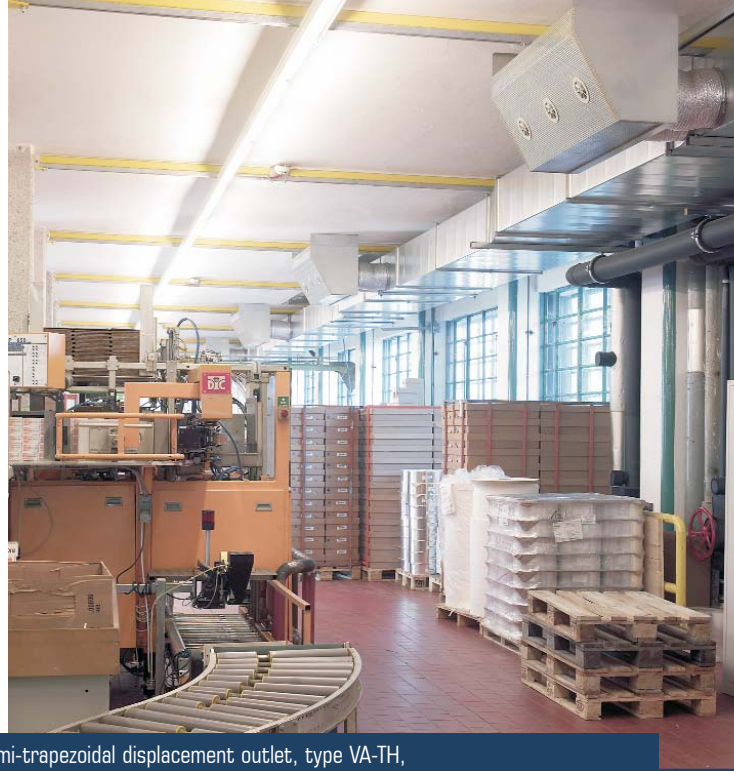


As supplied to: 'Hagen-Batterie', Soest / D
'ICI Lacke & Farben GmbH', Hilden / D

Some applications



Circular displacement outlet, type VA-ZD,
Tijl, Zwolle / NL



Semi-trapezoidal displacement outlet, type VA-TH,
at 'Austria Tabak AG', Linz / A



Rectangular displacement outlet and displacement
quadrant in the Axel Springer publishing house,
Essen-Kettwig / D



Rectangular displacement outlet, type VA-RN,
in the printing shop of 'Vorarlberger Medienhaus',
Schwarzach / A



Radial displacement outlet, type VA-PV,
at 'Scheyer Verpackungstechnik GmbH', Klaus / A



Trapezoidal displacement outlet, type VA-T,
at 'Wolford AG', Bregenz / A



Conical displacement outlet, type VA-K,
in an aircraft painting hangar of
'Deutsche Airbus', Hamburg / D



Circular displacement outlet, type VA-ZD,
at 'BMW AG', Leipzig / D
(Photographer: Martin Klindtworth)



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