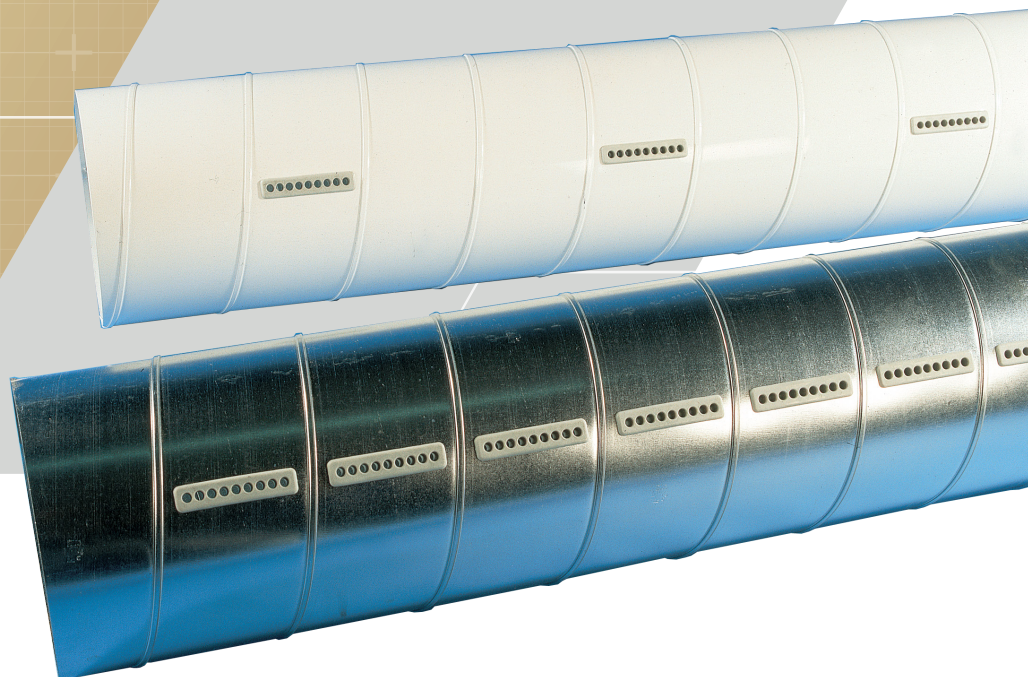


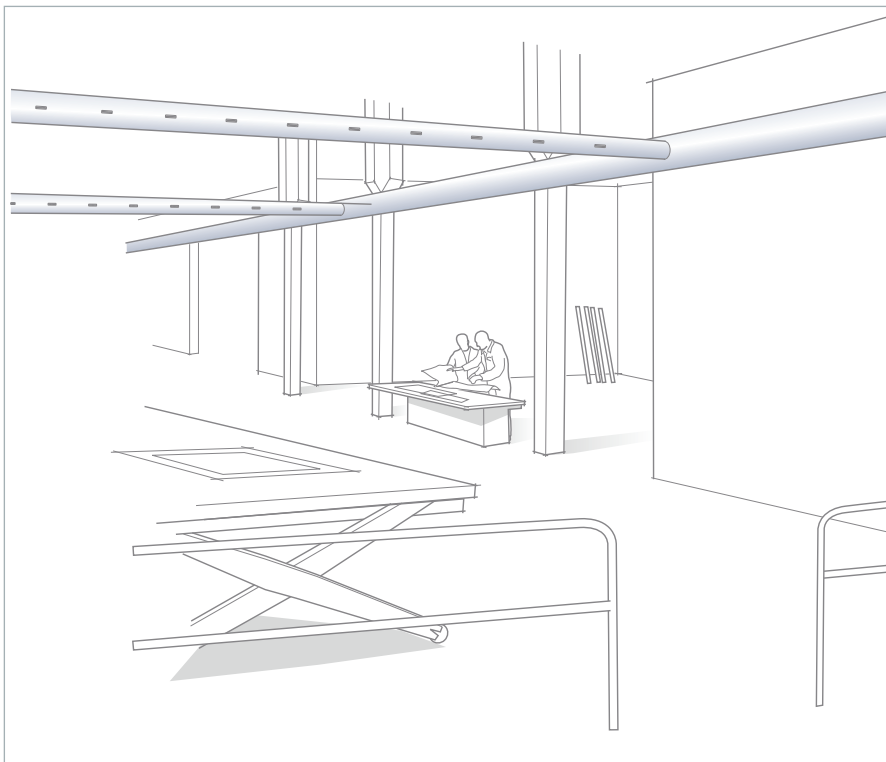
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Air distribution and exhaust system UNO

TECHNICAL DATA

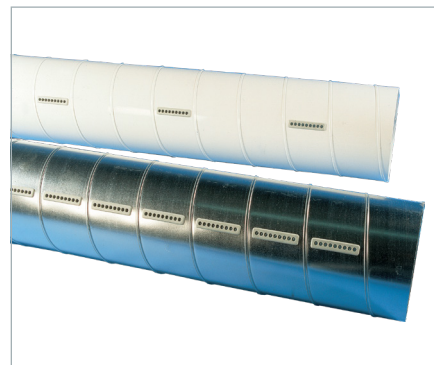
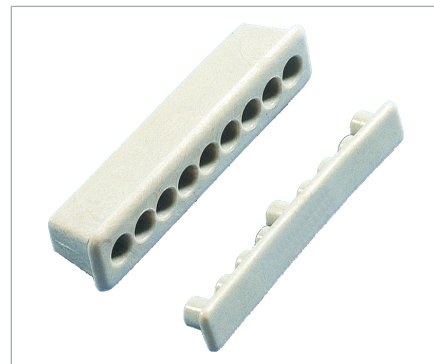




UNO AIR DISTRIBUTION AND EXHAUST SYSTEM

UNO is suitable for various kinds of air supply and exhaust systems. The UNO system is especially applicable where undertempered supply air is needed and where the supply air volume needs to be controlled.

The nozzles can be arranged in one or two rows, the angle between two nozzle rows is usually 180°.



SPECIFICATIONS

- Effective mixing technique, making air distribution in the room draughtless.
- Well suited for supplying air much cooler than room air and for VAV.
- Works quietly, allowing on-view installation

PRODUCT CODE EXAMPLE

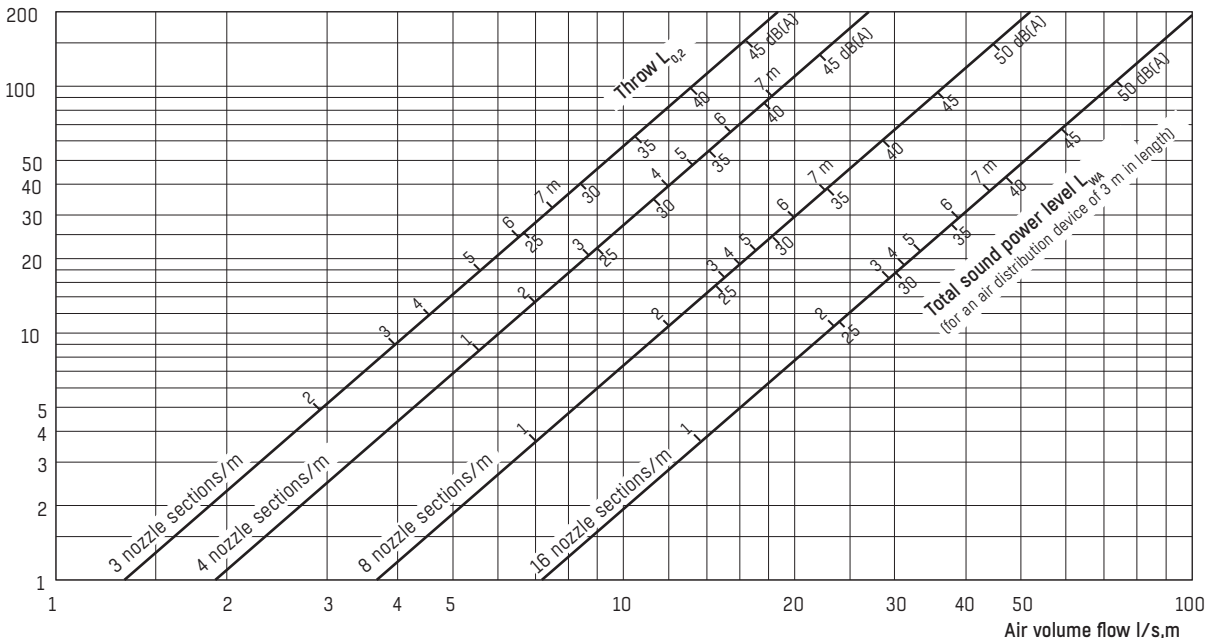
Air distribution and exhaust system
UNO-016-4-1

AIR FLOW, PRESSURE DROP, SOUND LEVEL

BASIC DATA FOR THE SELECTION

Before selecting UNO ducts for your system, first determine the following: internal and external loads, load zones, desired indoor climate, air volume flow and heating/cooling power to be transmitted, floor plan, arrangement of equipment, furnishings and supply/exhaust ducts.

Pressure loss Pa (nozzle pressure p_s)



The graph only indicates the required number of nozzles per duct metre, not the required duct size. Experience shows that in the case of comfort ventilation, the suitable air velocity at the duct inlet is 3 m/s; in industrial plants the inlet velocity can be as high as 5 m/s. Finally always check that the dynamic pressure ($p_d = \rho \times V^2/2$) is lower than the nozzle pressure.

Supply air: dynamic pressure must be lower than 0,7 x nozzle pressure ($p_d < 0,7 \times p_s$).

Exhaust air: dynamic pressure must not exceed nozzle pressure ($p_d \leq 1,0 \times p_s$).

READING THE UNO CHARACTERISTIC CURVE

The diagonal lines in the graph represent UNO ducts with different nozzle arrangements (e.g. 3, 4 or 8 nozzles per metre), the vertical axis is for nozzle pressure (p_s), and the horizontal axis for air volume flow (l/s,m), which is always determined first. The scales above the diagonal lines show the throw (m) (usually 0,7 x room depth). The total sound power level L_{WA} is given below each diagonal line for nozzle section. The values refer to an air distribution device of 3 m in length. The combined effect of multiple UNO devices can be calculated by logarithmic addition of the sound power levels of separate devices.

Example: There are two UNO-020-8-1 air distribution devices of 3 m in length, the air volume flow being 16 l/s,m. By applying the rule of addition, the total sound power level of the two nozzle sections amounts to:

$$L_{WA, tot} = L_{WA, 3m} + 10 \log n, \text{ so } L_{WA, tot} \approx 30 \text{ dB } (27 \text{ dB} + 10 \log 2).$$

To select the right UNO product for your system, start by determining the air volume flow, e.g. 16 l/s,m. Then draw a straight, vertical line from the point 16 of the horizontal axis to the diagonal line representing UNO duct with 16 nozzles per metre. Check the corresponding nozzle pressure given on the vertical axis; in this case it is 5 Pa, which is too low for the system to work. Draw the line further up to the diagonal line representing UNO duct with 8 nozzles per metre, which is the suitable duct for most applications since it covers an air volume flow range of 14...27 l/s,m. For higher air volume flow rates the most suitable UNO duct is that with 16 nozzles per metre (nozzles in 2 rows).

APPLICATION AND FUNCTION

CONTROLLED AIR DISTRIBUTION

The small air jets from UNO nozzles mix effectively with a large mass of room air, giving an excellent induction ratio. Air is supplied along the entire length of the UNO duct, which means that the air flowing up to the nozzles also distributes evenly.

The pictures below show how the air jets from UNO nozzles quickly and effectively mix with room air, resulting in a circulating flow of mixed air in the room. The small air jets spread rapidly, and gradually the air velocity decreases.

Since the UNO system distributes air evenly and makes large masses of air move, the breath of air that sweeps the occupied zone is slow and extremely steady. And where the air flow is steady, the adverse effects of barriers, thermal forces, etc. are minor and local.

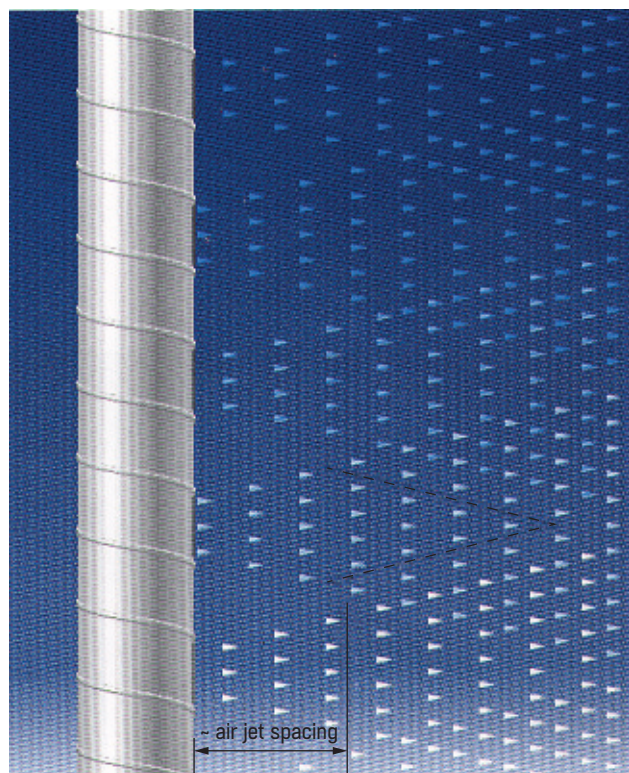


Figure 1: UNO air jets

IDEAL FOR VAV CONTROL

Since it was launched at the end of the 1970s, the UNO nozzle duct has gained a reputation among ventilation system designers and users for being a reliable product for various kinds of air supply and exhaust systems.

The UNO system is especially applicable where undertempered supply air is needed and where the supply air volume needs to be controlled. The system is dimensioned so that at the max. air volume flow the nozzle pressure is 40...50 Pa and that the air volume flow is reducible down to approx. 40 % of the maximum. The same applies to systems where the air volume is constant. For comfort ventilation, the UNO system should be dimensioned so as to keep the air flow velocity at the inlet of the ducts at 3 m/s or below. In industrial plants this rate must be ≤ 5 m/s.

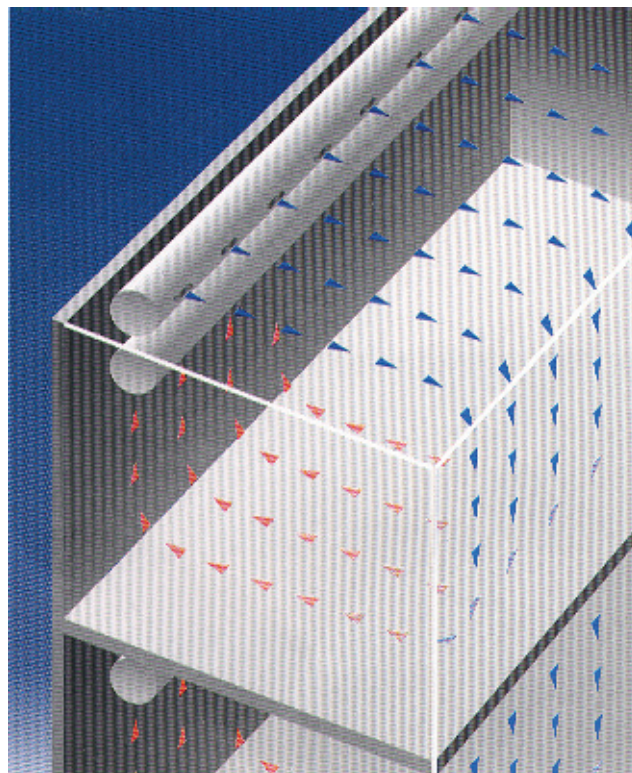


Figure 2: UNO circulating flow

ACCESSORIES, MATERIAL AND PRODUCT CODE

ACCESSORIES AND MATERIALS

UNO accessories include nozzle section covers, control devices, fixing and other accessories.

The standard material is galvanized steel sheet. Nozzles are made of grey PVC plastic.

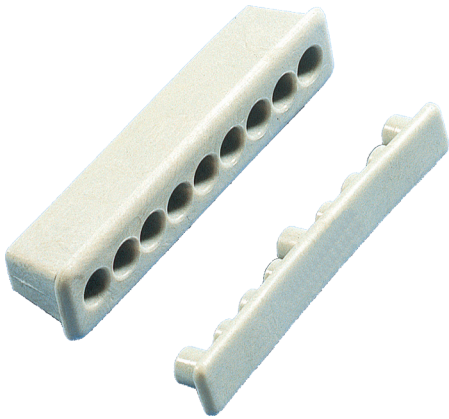


Figure 3: UNO nozzle section and section cover

DEFINITIONS

q_v	air volume flow	l/s, m
p_s	nozzle pressure	Pa
p_d	dynamic pressure	Pa
L_{WA}	total sound power level (A-weighted)	dB(A)
$L_{0,2}$	throw	m
v	air velocity in duct	m/s
n	number of sound sources of the same size	-

PRODUCT DATA

The nozzles can be arranged in one or two rows; the angle between two nozzle rows is usually 180° (in theory, all angles between 1° and 180° are possible).

PRODUCT CODE

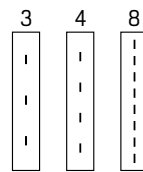
Air distribution and exhaust system

UNO-aaa-b-c

Diameter (aaa)

012, 016, 020, 025, 031, 040, 050

Nozzles/row/m (b)



Nozzle rows (c)



The angle between nozzle rows (from 1° to 180°) must be specified when ordering.

EXCELLENCE IN SOLUTIONS

FläktGroup is the European market leader for smart and energy efficient Indoor Air and Critical Air solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than a century of accumulated industry experience. The widest product range in the market, and strong market presence in 65 countries worldwide, guarantee that we are always by your side, ready to deliver Excellence in Solutions.

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