



Air diffuser

ZMD



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ZMD air diffuser

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ZMD air diffuser

Description

The air diffuser type ZMD is an **air diffuser for universal use in all mounting situations**. Owing to its **infinitely variable adjustment from long-throw to wide-angle diffusion**, it is universally suited to ventilate all types of rooms, particularly high-ceiling halls, rooms with considerable heat generation, behind raster ceilings, etc.

Suitable for all air-conditioning systems. Installation is possible in any ceiling construction. The ZMD diffuser head **has several rows of apertures**, arranged in a specific relationship. The front apertures can be completely or partially closed by an adjusting disc. The air flow rate can be infinitely controlled by sliding the diffuser head in the special connection spigot. **The supply air comes out of the apertures of the diffuser head and enters the room in a star pattern**. Zones of low pressure are created between the separate air jets and are quickly filled with room air. This causes **the air to mix extremely efficiently and rapidly**. **This strong induction effect allows operation at high temperature differences without creating any draughts in the residential area**.

Advantages:

- high inductive effect
- individual reduction or extension of the supply air jet by means of adjustable disc
- flow rate control by moving the whole diffuser head
- better flow rate distribution possible due to high pressure drop
- stable single jets

Construction

Cover plate

- Sheet steel painted to RAL 9010 (standard, white))
- sheet steel painted to RAL 9005 (black)
- Sheet steel painted to a freely selectable RAL colour (-xxxx, always with 4 digits)

Nozzle head

- Polystyrene 475 K, colour similar to RAL 9010 (white), flame-resistant
- Polystyrene 475 K, colour similar to RAL 9005 (black), flame-resistant

Sheet metal parts

- Sheet steel painted to RAL 9010 (standard, white))
- sheet steel painted to RAL 9005 (black)
- Sheet steel painted to a freely selectable RAL colour (-xxxx, always with 4 digits)

Spigot for installation in ceilings (-D00 / -D01)

- Sheet steel painted to RAL 9010 (standard, white))
- sheet steel painted to RAL 9005 (black)

Spigot for installation in round ducts (-RA0 / -RA1 / -RB0 / -RB1 / -RC0 / -RC0)

- galvanised sheet steel

Spigot for duct installation (-K00 / -K01)

- galvanised sheet steel

Model

ZMD-...-D00	= connection spigot for installation in ceilings (without cover plate)
ZMD-...-D01	= connection spigot for installation in ceilings (with cover plate)
ZMD-...-K00	= connection spigot for installation in ducts (only possible without cover plate)
ZMD-...-K01	= connection spigot for installation in ducts with curved blade (only possible without cover plate)
ZMD-...-RA0	= connection spigot for installation in round ducts ø R220-280 mm (only possible without cover plate)
ZMD-...-RA1	= connection spigot for installation in round ducts ø R220-280 mm with curved blade (only possible without cover plate)
ZMD-...-RB0	= connection spigot for installation in round ducts ø R290-540 mm (only possible without cover plate)
ZMD-...-RB1	= connection spigot for installation in round ducts ø R290-540 mm with curved blade (only possible without cover plate)
ZMD-...-RC0	= connection spigot for installation in round ducts ø R550-2000 mm (only possible without cover plate)
ZMD-...-RC1	= connection spigot for installation in round ducts ø R550-2000 mm with curved blade (only possible without cover plate)

Accessories

Plug for air pattern adjustment (-X)

- Without plug (standard, -0)
- With plug, selectable number of plugs (-1-9)

Sheet steel collar ø 490 mm

- Without sheet metal collar (standard, -BK0)
- With sheet metal collar (-BK1)

Fastening

Screw mounting (standard, -SM)

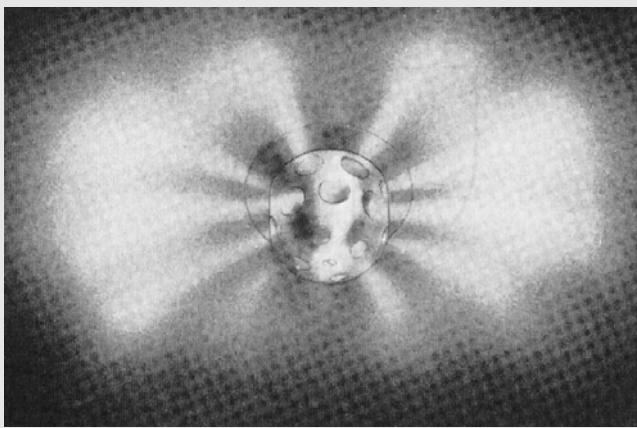
- Screws must be provided on site.

ZMD air diffuser

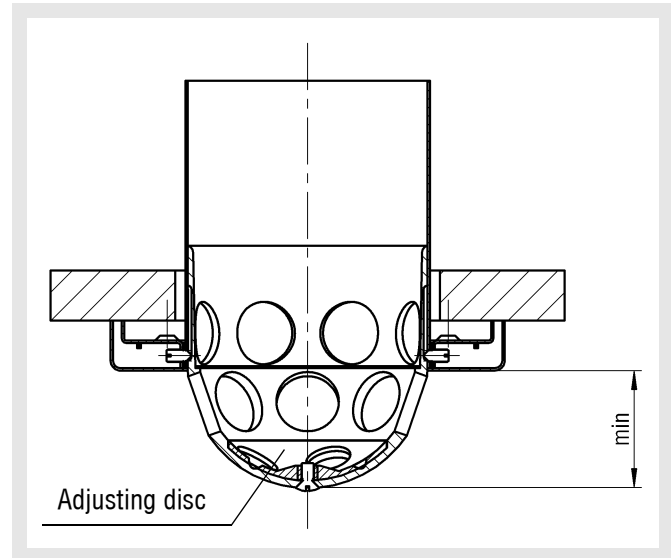
Models and dimensions

Air throw pattern

Wide angle setting



Minimum setting



Long throw setting

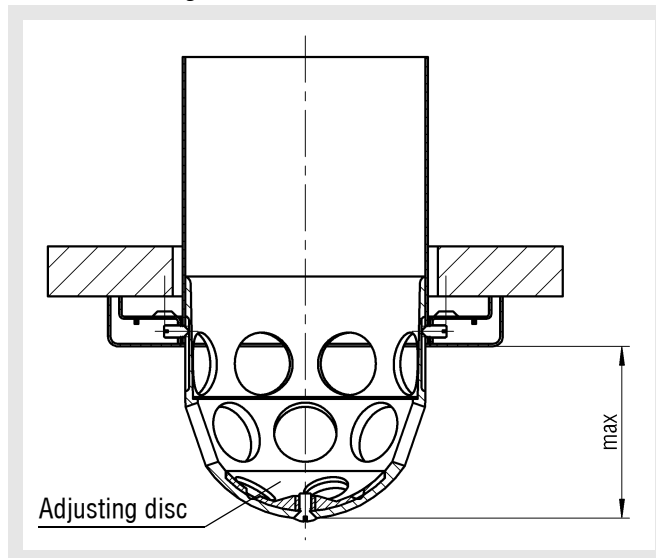


Standard setting: **maximum**

To reduce the flow rate, i.e., increase the pressure loss, by means of the nozzle, the diffuser head can be slid towards the rear, by loosening the slotted screws on the side, until the upper row is covered (minimum position). The volumetric flow can be determined, as shown in the pressure loss diagrams, by means of a static tube. Increase of noise due to the damping should be taken into consideration.

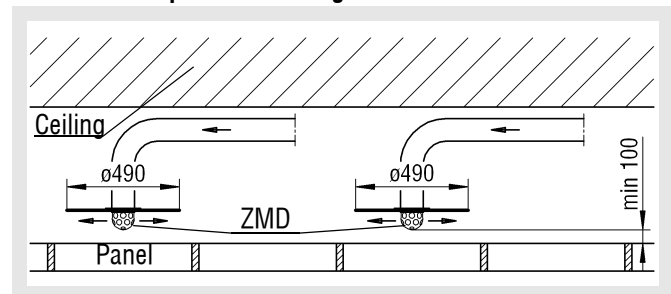
In the long throw position, the adjusting disc is open, and the baffle ring is removed. If draughts are created or if the values calculated in the diagram are too high, the air jet can be expanded by closing the adjusting disc. This will make the jet wider, i.e., the end velocity will be reduced. The wide angle setting is reached again when the disc is closed.

Maximum setting



For freely suspended ZMD nozzles, it is advantageous to place a sheet metal collar (-BK1) with a diameter of about 490 mm around the nozzle, as shown in the "Installation in panelled ceilings" example. The collar creates a Coanda effect which attracts the air jets and directs them horizontally into the room.

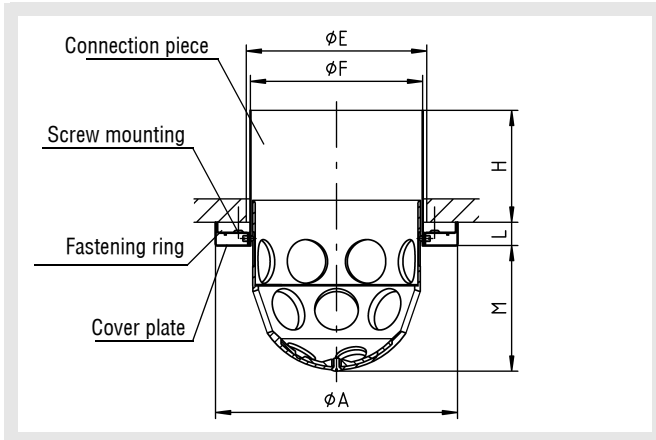
Installation in panelled ceiling



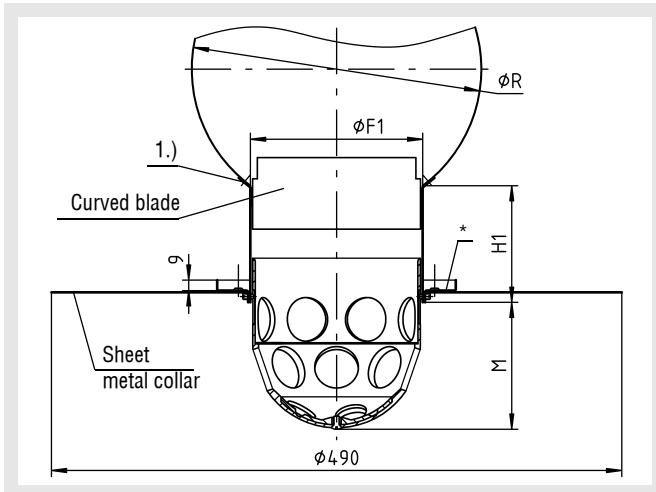
ZMD air diffuser

Dimensions

for installation in ceilings -D00 (with cover plate -D01)



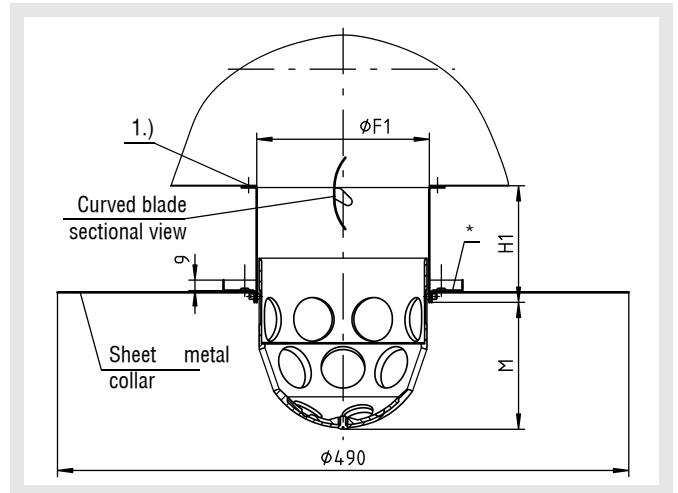
for installation in round ducts, -RA0 / -RB0 / -RC0 (with curved blade -RA1 / -RB1 / -RC1)



*Fastening ring fitted only if delivered with sheet metal collar
1.) Mounting holes without curved blade

- Model -RA0 or with curved blade -RA1, for $\phi R220-290$
- Model -RB0 or with curved blade -RB1, for $\phi R290-550$
- Model -RC0 or with curved blade -RC1, for $\phi R550-2000$

for installation in ducts -K00 (with curved blade -K01)



*Fastening ring fitted only if delivered with sheet metal collar
1.) On-site mounting holes

The sheet metal collar (-BK1) is delivered loose and can be fixed to the fastening ring with a self-tapping screw during on-site assembly. The sheet metal collar (-BK1) cannot be retrofitted, as the fastening ring is not included in the standard models for installation in round ducts (-RA0 / -RA1 / -RB0 / -RB1 / -RC0 / -RC1) and in ducts (-K00 / -K01).

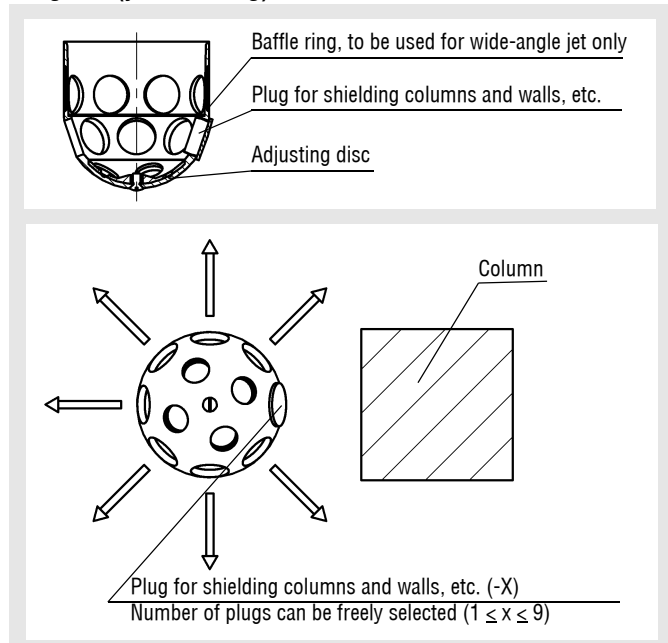
Available sizes

NW	ϕA	ϕE	ϕF	$\phi F1$	H	H1	L	M
100	156	106	99	100	96	90	20	55-85
150	208	155	148	150	96	100	20	80-125

ZMD air diffuser

Dimensions of accessories

Jet guide (jet shielding)

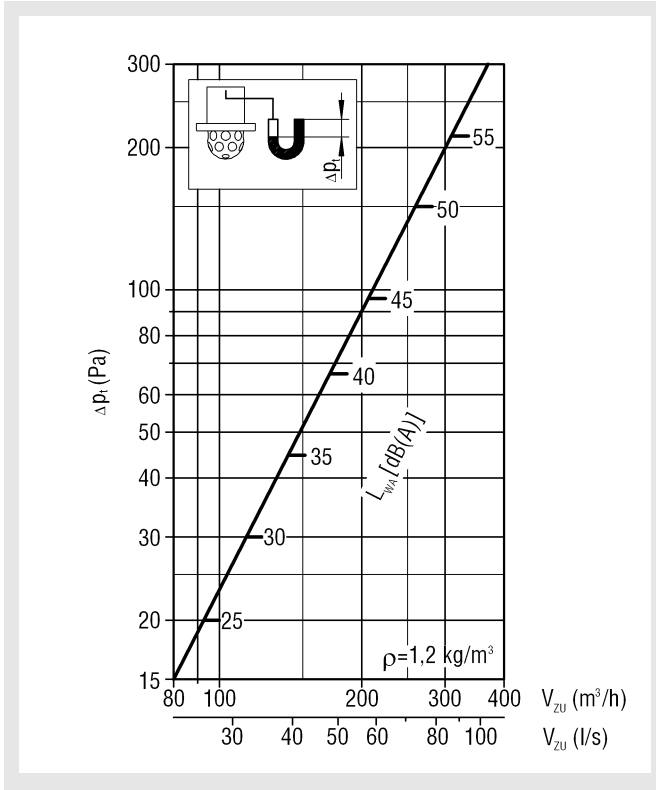


ZMD air diffuser

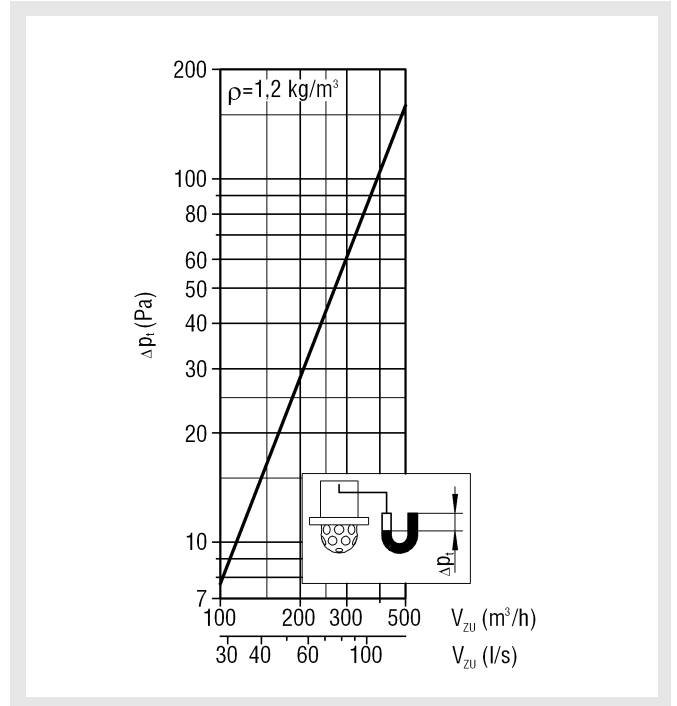
Technical data

Pressure loss and noise level

ZMD-100 wide-angle setting (max.)

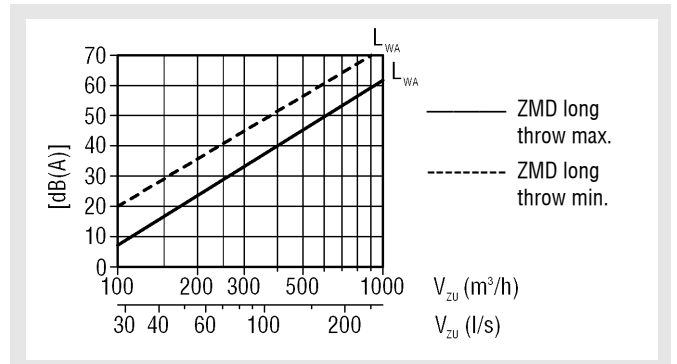


ZMD-150 long throw (min.)



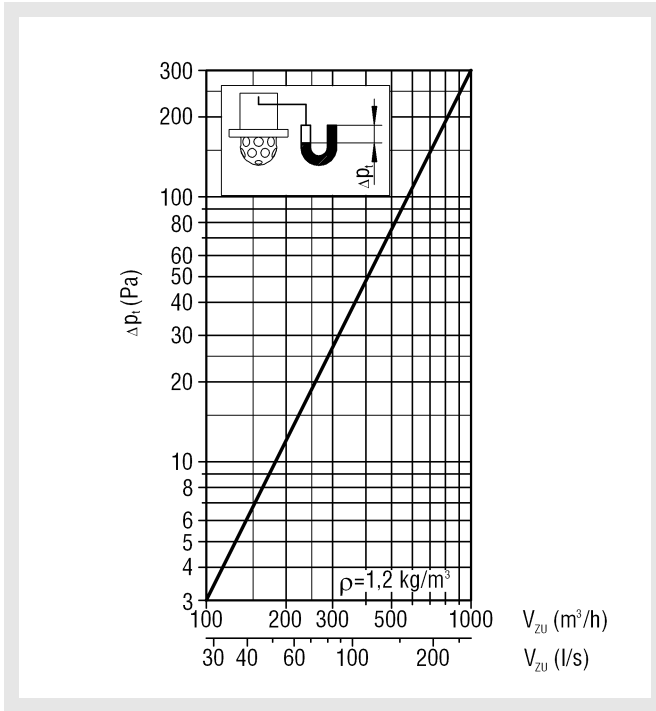
sound power level

ZMD-150



Total pressure loss

ZMD-150 long throw (max.)



The values apply to hose connections. They decrease by approximately 4 dB for pressure duct connections.

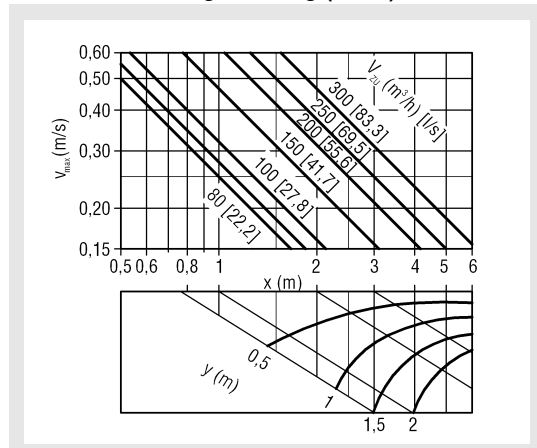
Relative difference in sound power level (RS)

Hz	125	250	500	1000	2000	4000
ZMD-150 >600m ³ /h	8	9	10	13	13	15
Long throw max. <600m ³ /h	8	11	15	19	21	30
ZMD-150 long throw min.	5	8	12	13	14	17

ZMD air diffuser

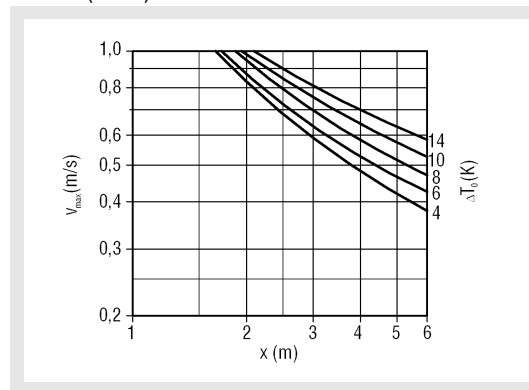
Maximum end velocity of jet

ZMD-100 wide-angle setting (max.)



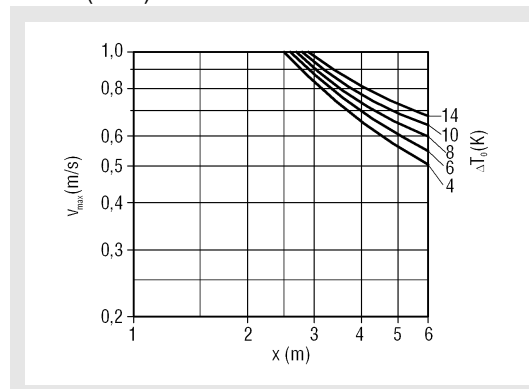
ZMD-150 in cooling mode

$V=200$ (m³/h)



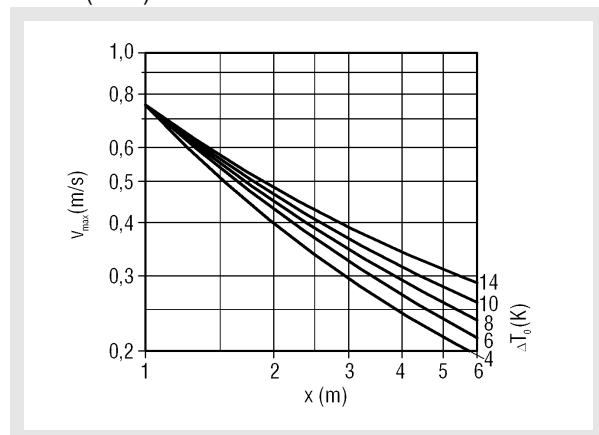
ZMD-150 in cooling mode

$V=300$ (m³/h)

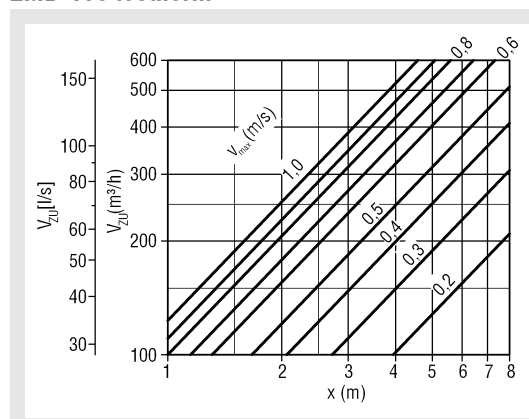


ZMD-150 in cooling mode

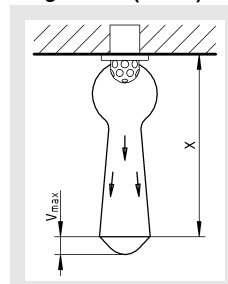
$V=100$ (m³/h)



ZMD-150 isotherm



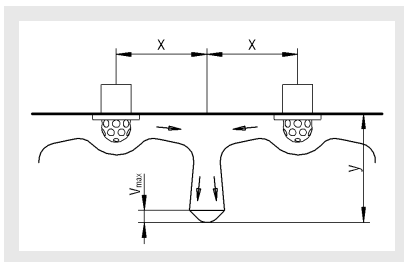
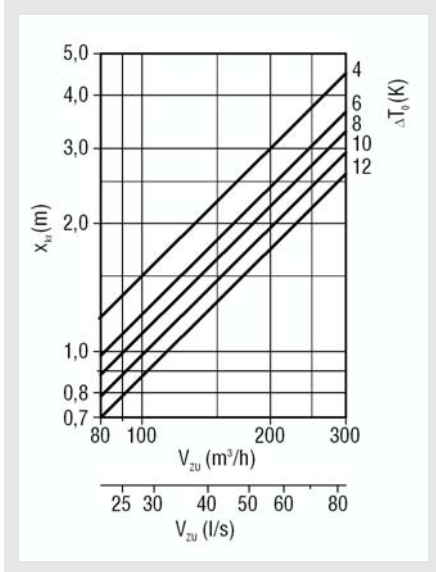
long throw (max.)



ZMD air diffuser

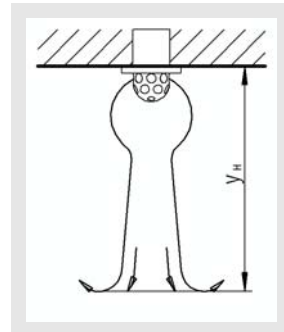
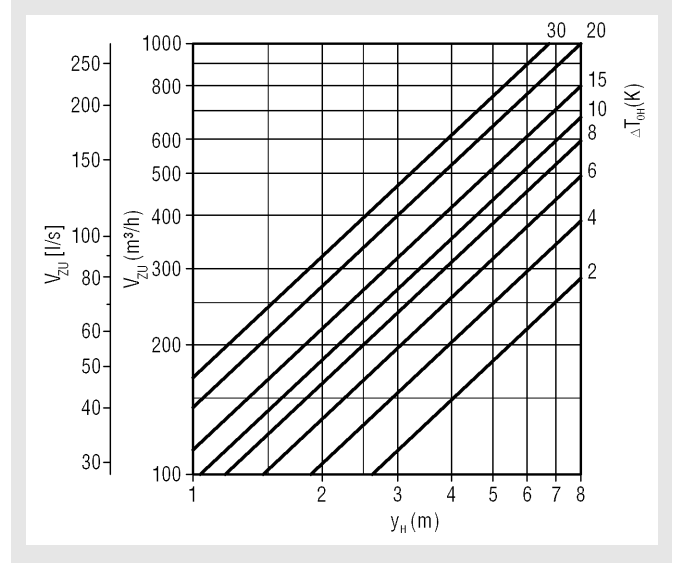
Critical throw

ZMD-100 wide-angle setting (max.)

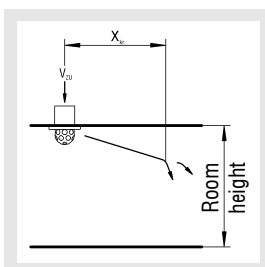
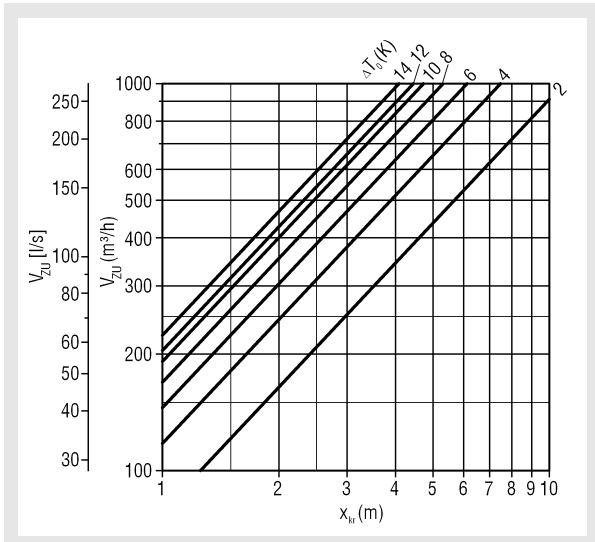


Maximum penetration

ZMD-150 (heating) long throw (max.)



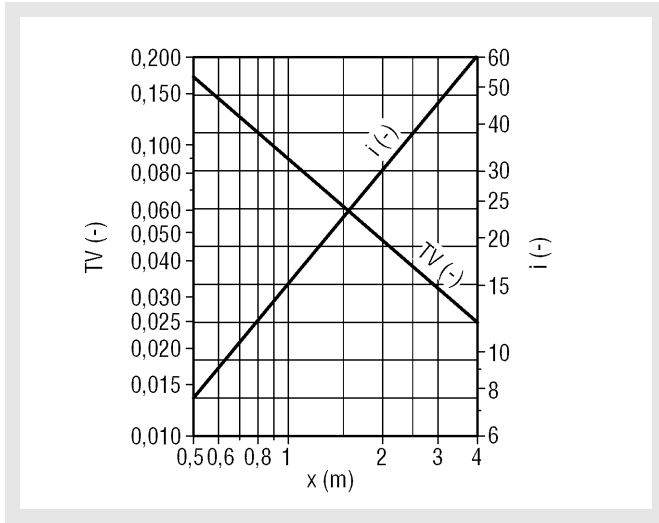
ZMD-150 wide-angle setting (max.)



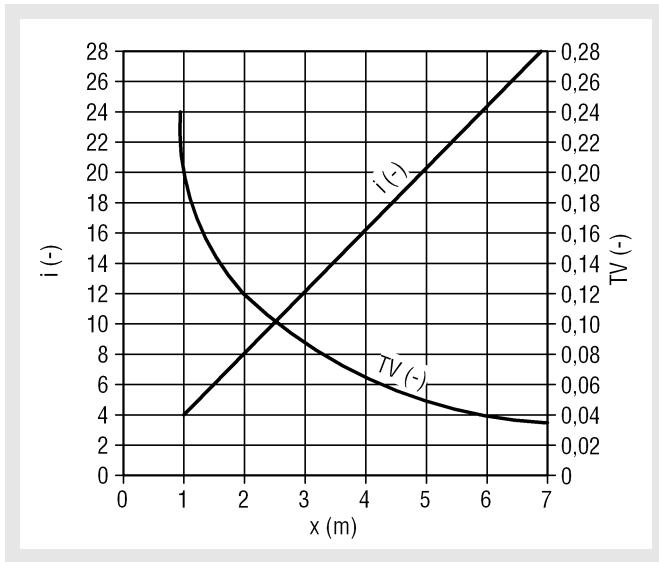
ZMD air diffuser

Temperature and induction ratios

ZMD-100



ZMD-150

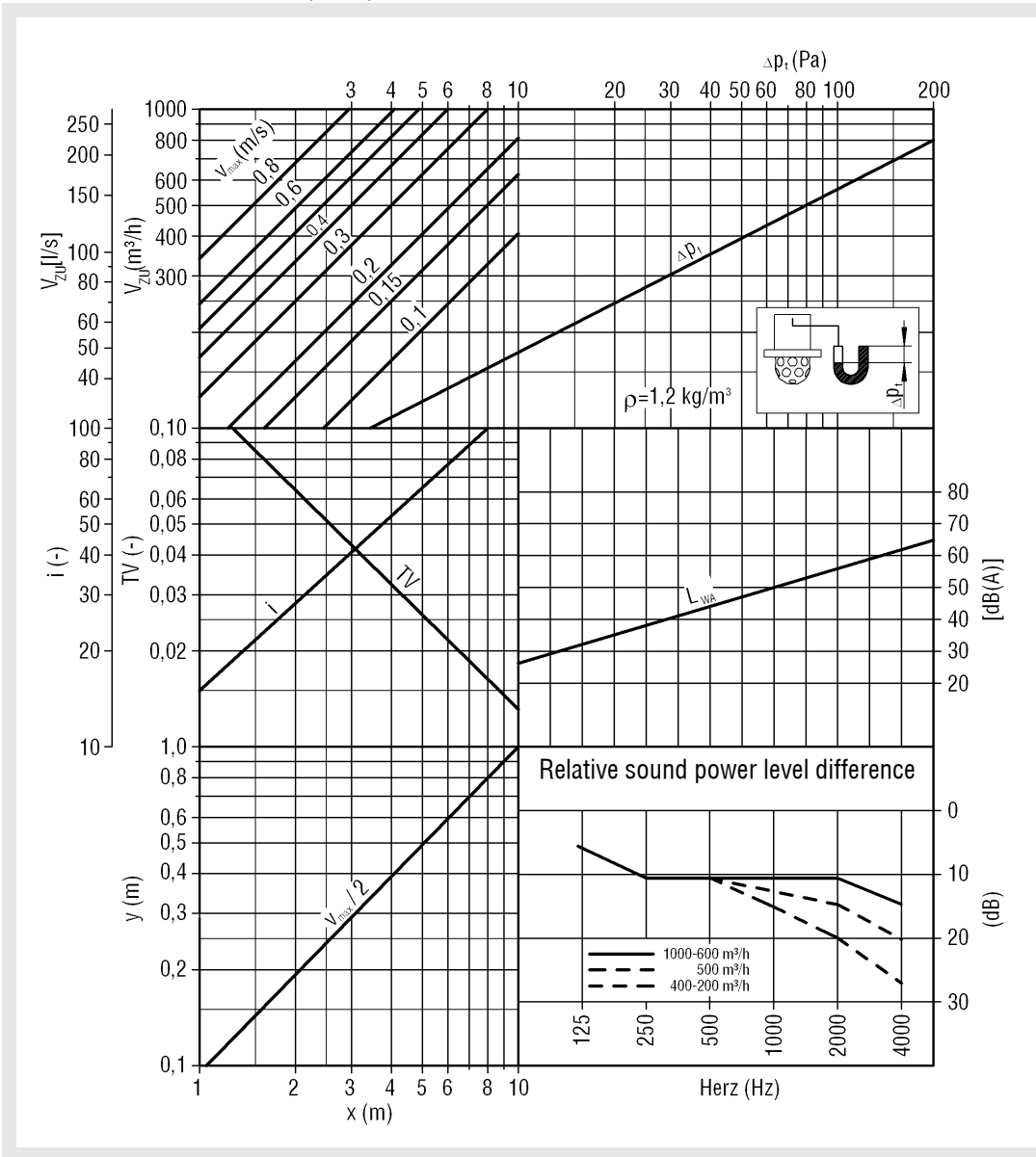


ZMD air diffuser

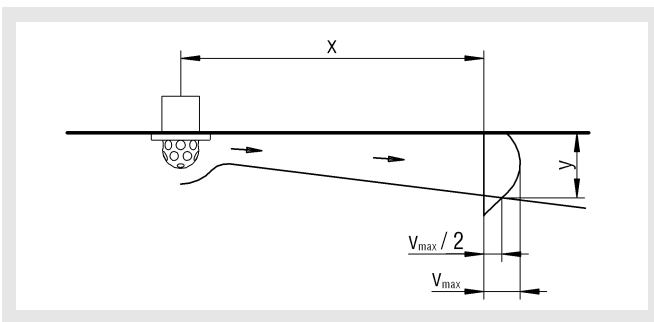
Further data

Selection diagram:

ZMD-150 wide-angle setting (max.)

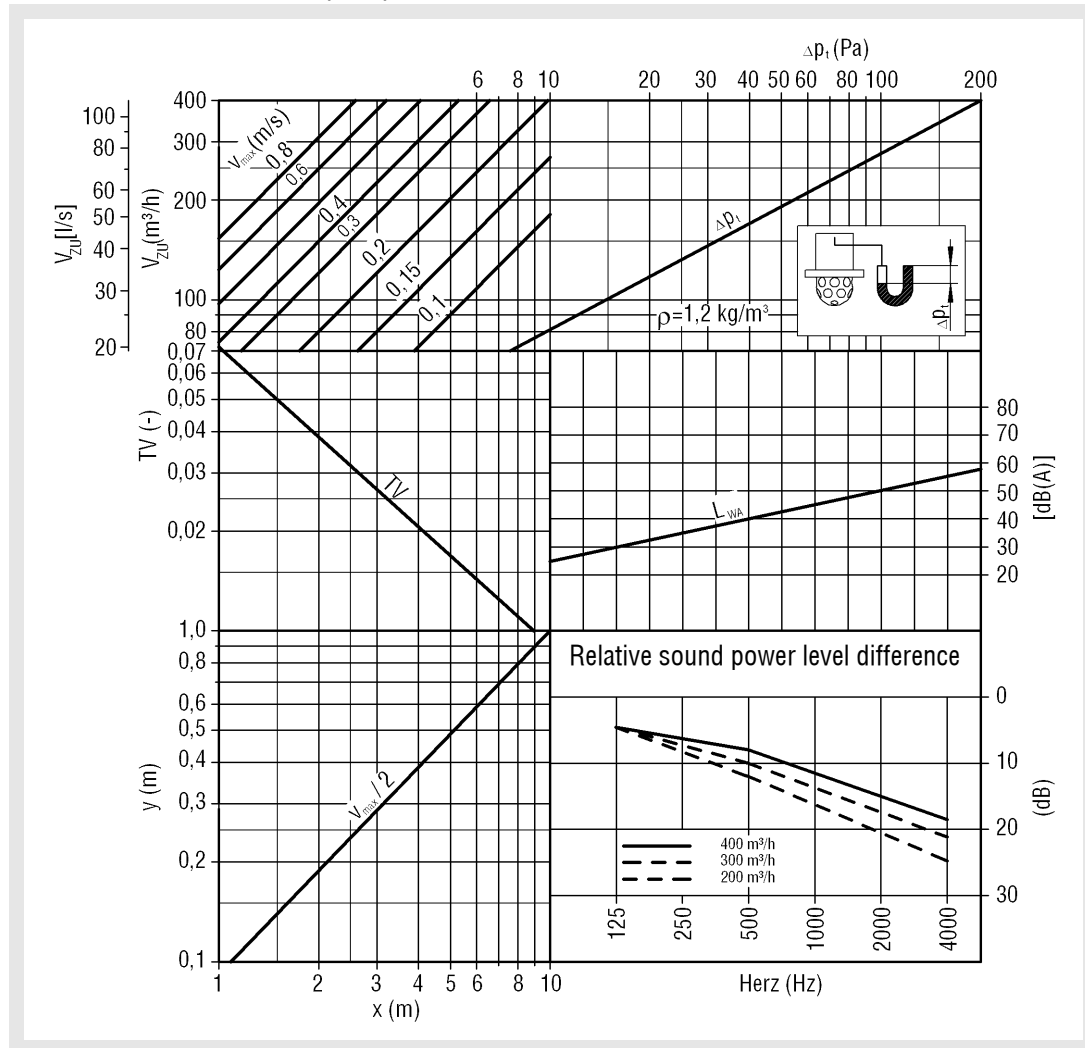


Read temperature ratio TV for determining the temperature ΔT_x in the diagram.
For the jet throw $x + \text{jet throw } y$, the value x from the diagram must be used.

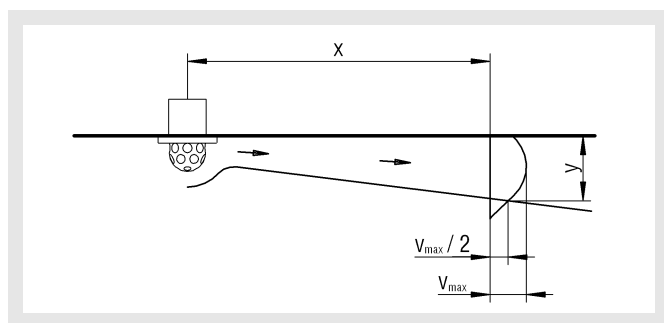


ZMD air diffuser

**Selection diagram:
ZMD-150 wide-angle setting (min.)**



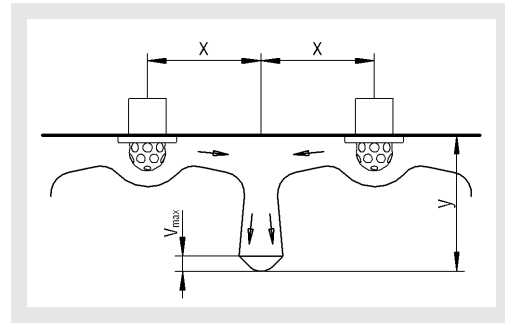
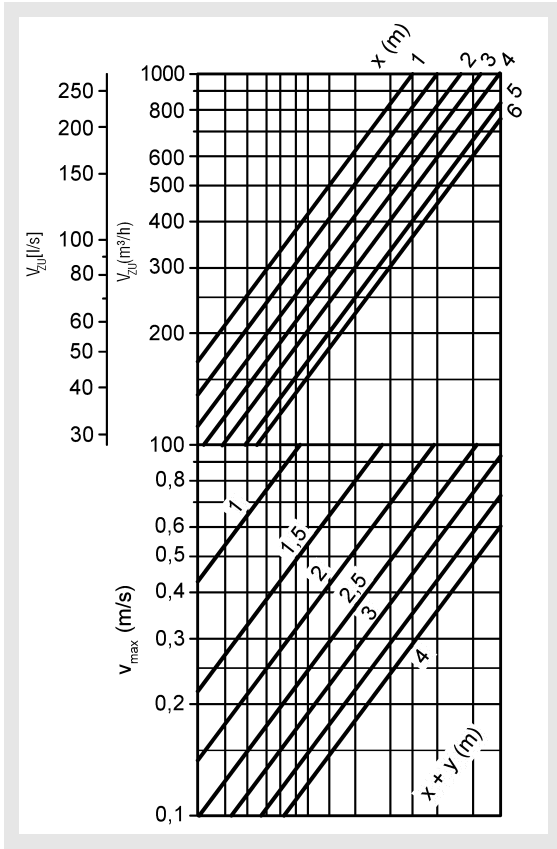
Read temperature ratio TV for determining the temperature ΔT_x in the diagram.
For the jet throw x + jet throw y , the value x from the diagram must be used.



ZMD air diffuser

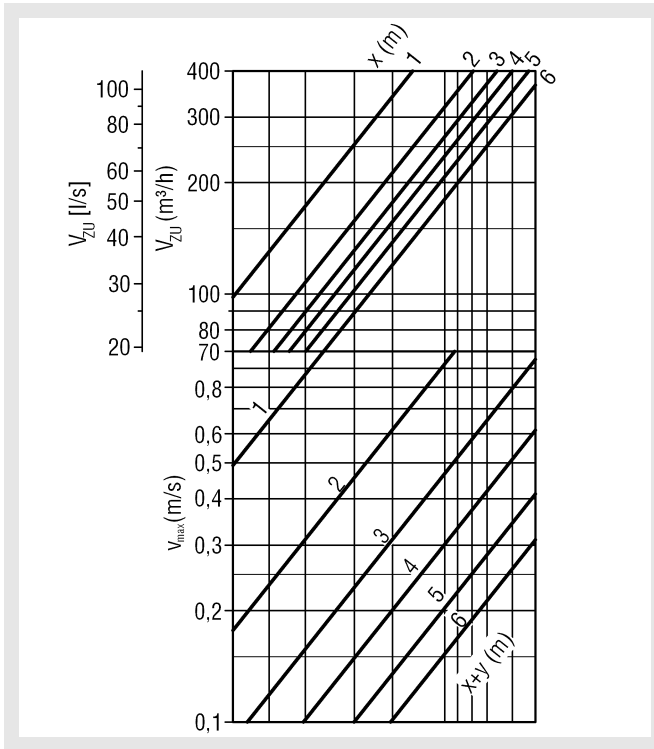
ZMD-150 wide-angle setting (max.)

Two opposite jets



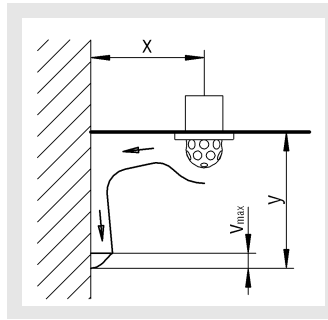
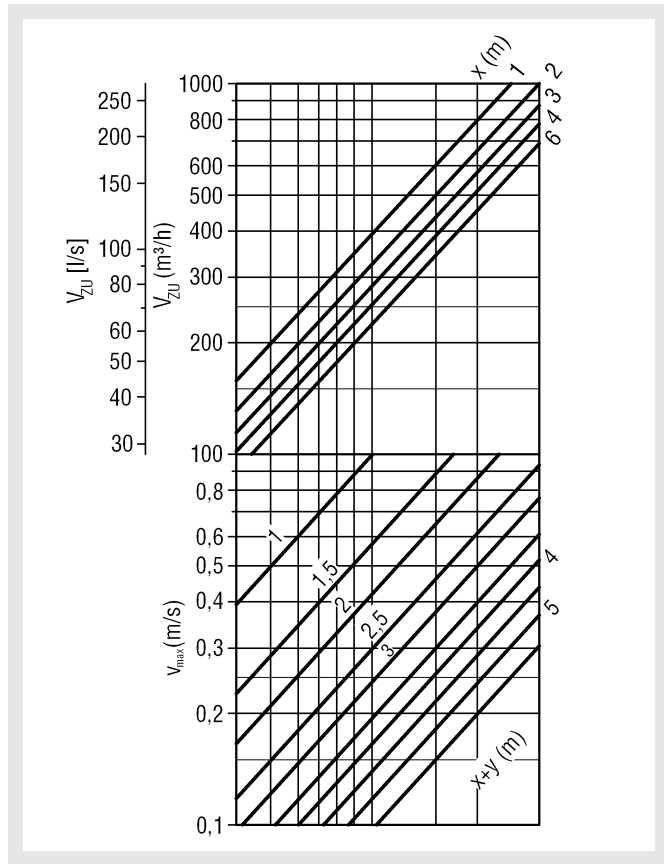
ZMD-150 wide-angle setting (min.)

Two opposite jets

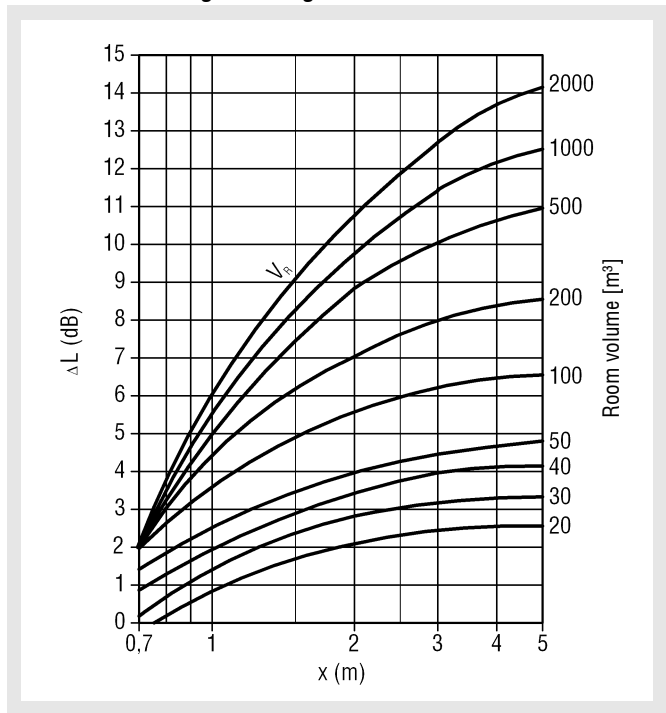


ZMD air diffuser

ZMD-150 wide-angle setting (max.)
with wall effect

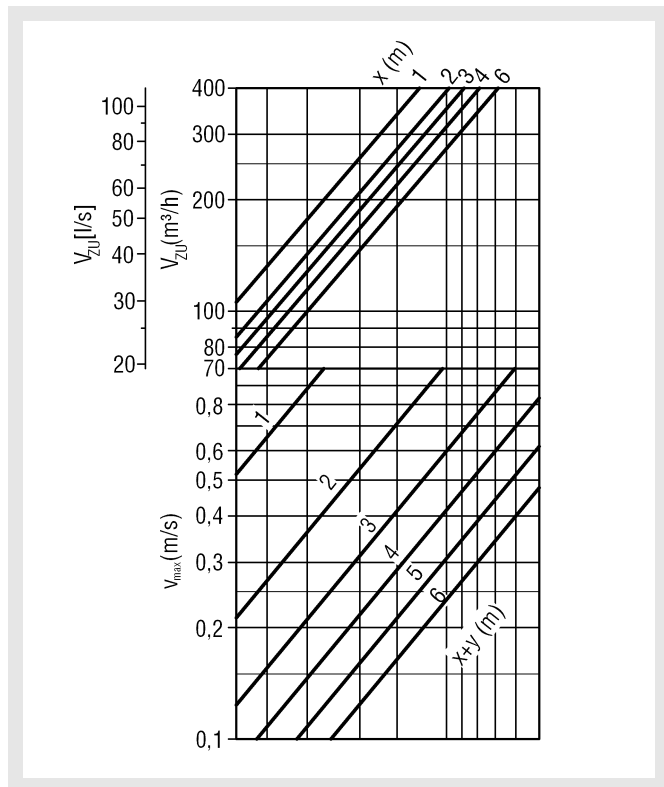


Acoustic data ZMD-150 wide-angle setting



For V_R , the following values must be used:
sound-attenuated room = $V_R \times 2$, normal room = V_R and hard room = $V_R \times 0.5$

ZMD-150 wide-angle setting (min.)
with wall effect



ZMD air diffuser

Legend

V_{ZU}	(m ³ /h) [l/s]	= Supply air volume
V_R	(m ³)	= Room volume
v_{max}	(m/s)	= Maximum end velocity of jet
A_{stirn}	(m ²)	= Face area
x	(m)	= horizontal throw
y	(m)	= vertical throw
x_{kr}	(m)	= Critical throw
ρ	(kg/m ³)	= Density
Δp_t	(Pa)	= Pressure loss
L_{WA}	[dB(A)]	= A-weighted sound power level
ΔT_0	(K)	= Temperature difference between supply air temperature and room temperature ($\Delta T_0 = t_{ZU} - t_R$)
ΔT_{OH}	(K)	= Temperature difference between air supply and room temperature in heating mode ($\Delta T_{OH} = t_{ZUH} - t_{RH}$)
ΔT_x	(K)	= Temperature difference at point x
t_{zu}	(K)	= Supply air temperature
t_R	(K)	= Room temperature
i	(-)	= Induction ratio ($i = V_x / V_{ZU}$)
TV	(-)	= Temperature ratio ($TV = \Delta T_x / \Delta T_0$)
RH	(mm)	= Room height
NW	(mm)	= Nominal width
ΔL	(dB)	= Room attenuation
y_H	(m)	= Penetration depth in heating mode
$x+y$	(m)	= Horizontal + vertical throw
V_x	(m ³ /h) [l/s]	= Total air jet volume at point x

ZMD air diffuser

ZMD order code

01	02	03	04	05	06	07	08
Type	Nominal width	Nozzle head colour	Mounting	Model	Sheet metal collar	Paint	Shielding plug
Example							
ZMD	-100	-9010	-SM	-D01	-BK0	-9010	-0

All fields must be filled when ordering.

Sample

ZMD-100-9010-SM-D01-BK0-9010-0

Air diffuser type ZMD | nominal width 100 | nozzle head colour RAL 9010 (white) | with screw mounting | connection spigot for installation in ceilings with cover plate | without sheet metal collar | sheet metal parts painted to RAL colour 9010 (white) | without shielding plug

Order details

01 - Type

ZMD = Air diffuser type ZMD

02 - Nominal width

100 = Nominal width 100 mm

150 = Nominal width 150 mm

03 - Nozzle head colour

9005 = RAL colour 9005 (polystyrene, black)

9010 = RAL colour 9010 (polystyrene, white)(standard)

04 - Mounting

SM = Screw mounting (standard)

05 - Model

D00 = connection spigot for installation in ceilings (without cover plate)

D01 = connection spigot for installation in ceilings (with cover plate)

K00 = connection spigot for installation in ducts (only possible without cover plate)

K01 = connection spigot for installation in ducts with curved blades (only possible without cover plate)

RA0 = connection spigot for installation in round ducts øR220-280 mm (only possible without cover plate)

RA1 = connection spigot for installation in round ducts ø R220-280 with curved blades (only possible without cover plate)

RB0 = connection spigot for installation in round ducts øR290-540 mm (only possible without cover plate)

RB1 = connection spigot for installation in round ducts ø R290-540 with curved blades (only possible without cover plate)

RC0 = connection spigot for installation in round ducts øR550-2000 mm (only possible without cover plate)

RC1 = connection spigot for installation in round ducts ø R550-2000 with curved blades (only possible without cover plate)

06 - Sheet metal collar

BK0 = without sheet metal collar (standard)

BK1 = with sheet metal collar (not possible for ceiling installation -D00 / -D01)

07 - Paint

9005 = fastening / cover plate, sheet metal cover and connection spigot painted to RAL colour 9005 (black)

9010 = fastening / cover plate, sheet metal cover and connection spigot painted to RAL colour 9010 (standard, white)

xxxx = fastening / cover plate, sheet metal cover and connection spigot painted to a RAL colour of your choice (always with 4 digits)

08 - Shielding plug

X = Selectable number of plugs (0-9), without plug as standard

ZMD air diffuser

Specification texts

Air diffuser with high inductive effect, flame-resistant. Consisting of a plastic (polystyrene 4754) nozzle head with radially arranged apertures with integrated adjusting disc and connection spigot.

Product: SCHAKO type **ZMD-100/-150**

Model:

ZMD-...-D00	= connection spigot for installation in ceilings (without cover plate)
ZMD-...-D01	= connection spigot for installation in ceilings (with cover plate)
ZMD-...-K00	= connection spigot for installation in ducts (only possible without cover plate)
ZMD-...-K01	= connection spigot for installation in ducts with curved blade (only possible without cover plate)
ZMD-...-RA0	= connection spigot for installation in round ducts \varnothing R220-280 mm (only possible without cover plate)
ZMD-...-RA1	= connection spigot for installation in round ducts \varnothing R220-280 mm with curved blade (only possible without cover plate)
ZMD-...-RB0	= connection spigot for installation in round ducts \varnothing R290-540 mm (only possible without cover plate)
ZMD-...-RB1	= connection spigot for installation in round ducts \varnothing R290-540 mm with curved blade (only possible without cover plate)
ZMD-...-RC0	= connection spigot for installation in round ducts \varnothing R550-2000 mm (only possible without cover plate)
ZMD-...-RC1	= for installation in round ducts \varnothing R550-2000 mm with curved blade (only possible without cover plate)

Fastening:

- Screw mounting (-SM)
 - Screws must be provided on site.

Accessories:

- Plug for air pattern adjustment (-X)
- Sheet metal collar \varnothing 490mm (-BK1) (not possible for ceiling installation -D00 / -D01)