

02



Circular diffusers



Square diffusers

Circular diffusers, Square diffusers

Circular and square diffusers are designed for supply and extract air. Due to high induction (mixing of supply and room air) they are suitable for larger temperature differences between the supply and room air. Diffusers have high capacity and low sound power level.

VENTILATING GRILLES,
VENTILATING VALVES

CIRCULAR DIFFUSERS,
SQUARE DIFFUSERS

SWIRL DIFFUSERS,
VARIABLE SWIRL
DIFFUSERS

SLOT DIFFUSERS,
ROUND DUCT DIFFUSERS

AIR DISPLACEMENT
UNITS

SUPPLY AIR NOZZLES

EXTERNAL ELEMENTS

AIR FLOW
CONTROL UNITS

SOUND ATTENUATORS,
SOUND ATTENUATING
LOUVRES

Overview

■ Circular diffusers

Circular diffusers can be used for supply or extract air. Due to high induction (mixing of supply and room air) they are suitable for larger temperature differences between the supply and room air. Diffusers have high capacity and low sound power level.

Steel circular diffusers OD-1, OD-2

They consist of sheet steel, powder coated in RAL 9010. Upon customer's request, they can be coloured in any RAL colour.

Aluminium circular diffuser OD-3N

Diffuser rings are made of sheet aluminium and regulation mechanism consist of steel. Diffuser is powder coated in RAL 9010. Upon customer's request, they can be coloured in any RAL colour.

■ Square diffusers

Square diffusers are designed for supply and extract air. Due to high induction (mixing of supply and room air) they are suitable for larger temperature differentials between the supply and room air. Diffusers have high capacity and low sound power level.

Steel square diffusers KD-1, KD-2, KD-15, KD-16

They consist of sheet steel, powder coated in RAL 9010. Upon customer's request, they can be coloured in any RAL colour. Plenum box is made of galvanised sheet steel.

Steel circular diffusers OD-1, OD-2



OD-1

OD-2

Aluminium circular diffusers OD-3N



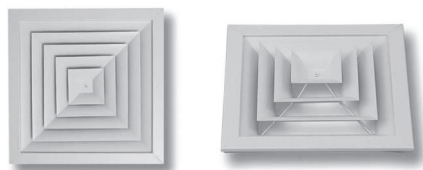
OD-3N

Circular diffuser OD-10



OD-10

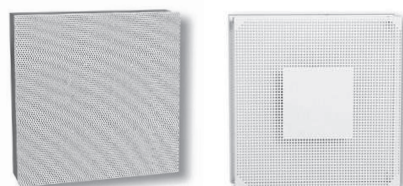
Square diffusers



KD-1

KD-2

Perforated square diffusers












KD-15

KD-16

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Legend of symbols

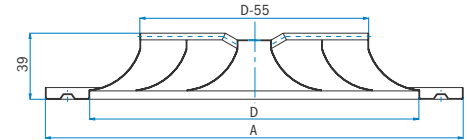
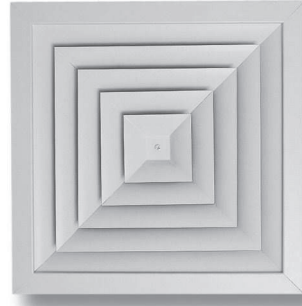
- | | | |
|--|---|---|
| Al Element is made of aluminium profiles, aluminium sheet or aluminium casting. |  Element is intended to be built in the wall. |  Element is suitable for the supply of cool air (cooling). |
| St Element is made of steel sheet. |  Element is intended to be built in the ceiling or in the wall. | M Element allows regulation by electric motor (Belimo electric motors). |
|  Element is powder painted in standard RAL 9010 colour. Other desired colour is to be specified in the order. |  Element for air conditioning of rooms with floor to ceiling heights room up to 4 m. | F Element is intended for air filtration. The filter of class ... is built in. |
|  Shady symbol means possibility of optional material, surface protection, motor version, ... |  Element for air conditioning of rooms with floor to ceiling heights from 6 to 15 m. | CD The possibility of the automatic selection and calculation of the technical characteristics of grilles and difusers in regard to the given conditions with the assistance of the Klima ADE program. |
|  Element is intended to be built in the floor. |  Element is suitable for the supply of warm air (heating). | INOX The element is made of stainless sheet steel AISI 304. |

Square diffusers

■ Square diffusers KD-1, KD-2

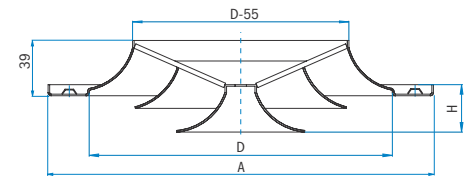
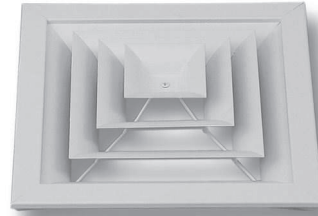
KD-1

- Fixed diffuser rings
- Central screw installation or fixing with peripheral screws
- Peripheral foamy sealing strip
- Registers F1



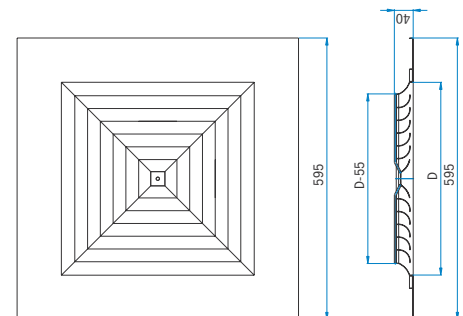
KD-2

- Fixed diffuser cone-form rings
- Central screw installation or fixing with peripheral screws
- Peripheral foamy sealing strip
- Registers F1



KD-1 in the plate

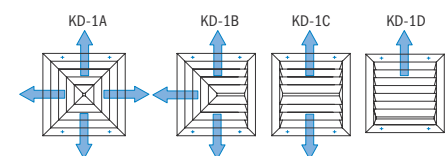
- KD-1 in the plate 595x595
- Sizes from 1 to 6 are available
- Installation with cross-bar or installation on the register fastened in the duct is possible
- Plenum boxes are equal to those for standard KD-1 corresponding nominal sizes
- Three mask types, depending to the air supply direction; two-, three- or four-way air supply



Dimensions table for KD-1 and KD-2:

Size	D (mm)	A (mm)	H (mm)	KD-1 A _{ef} (m ²)	KD-2 A _{ef} (m ²)
1	186	240	40	0.0104	0.0119
2	244	298	50	0.0185	0.0203
3	299	353	50	0.0279	0.0293
4	354	408	80	0.0440	0.0498
5	410	464	80	0.0628	0.0710
6	439	493	120	0.0728	0.0872
7	539	593	120	0.1175	0.1330
8	565	619	120	0.1280	0.1410

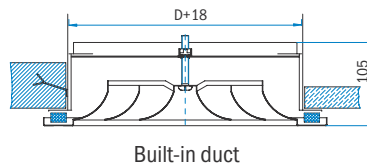
Types of diffuser faces



Installation of circular diffusers KD-1, KD-2

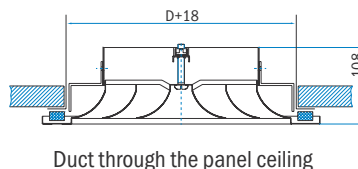
Installation 7

- Installation with crossbar
 Designation: **KD-1A/7, KD-2/7**

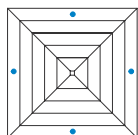
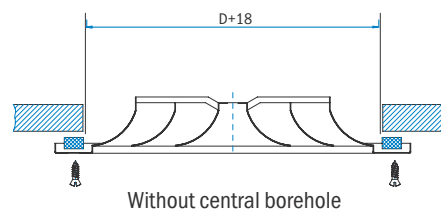


Installation 8

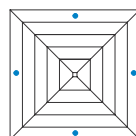
- Installation on register fastened in the duct
 Designation: **KD-1A/8-F1, KD-2/8-F1**



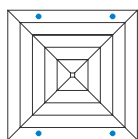
Direct installation in the ceiling with four screws



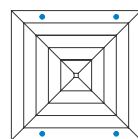
Installation V1X
 Designation: **KD-1A/V1X, KD-2/V1X**



Installation V1
 Designation: **KD-1A/V1, KD-2/V1**



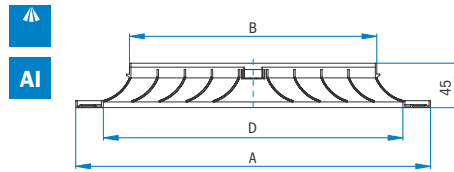
Installation V2X
 Designation: **KD-1A/V2X, KD-2/V2X**



Installation V2
 Designation: **KD-1A/V2, KD-2/V2**

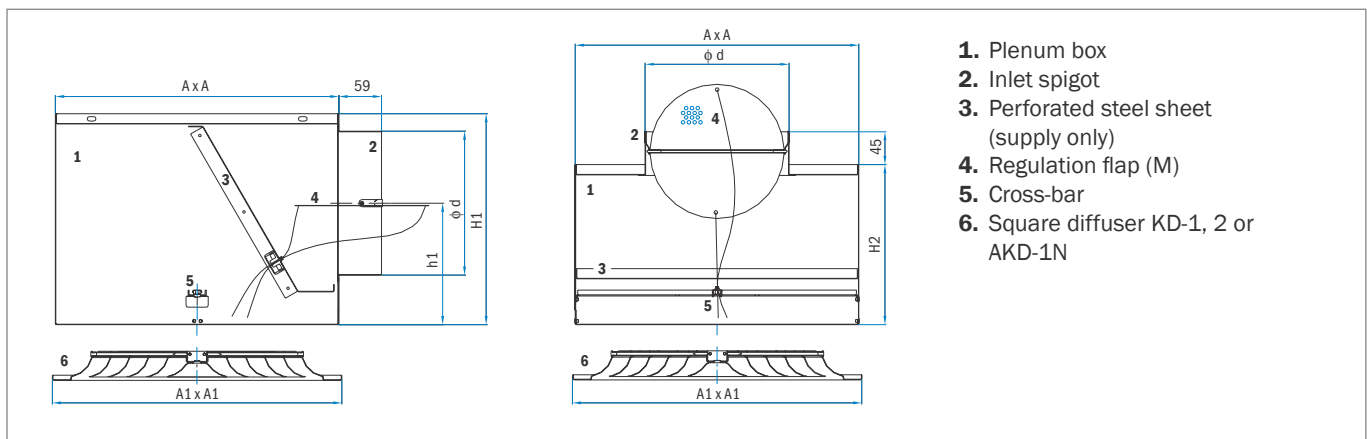
AKD-1N

- They are made of aluminium sections
- Fixed diffuser rings
- Central screw installation or fixing with peripheral screws
- Peripheral foamy sealing strip
- Registers F1



Size	D (mm)	A (mm)	B (mm)	AKD-1N A _{ef} (m ²)
1	188	244	135	0.010
2	244	300	191	0.015
3	300	356	247	0.025
4	356	412	303	0.042
5	412	468	359	0.060
6	442	498	389	0.070
7	542	598	489	0.115
8	567	623	514	0.125

Installation KD-1, KD-2 and AKD-1N with plenum box



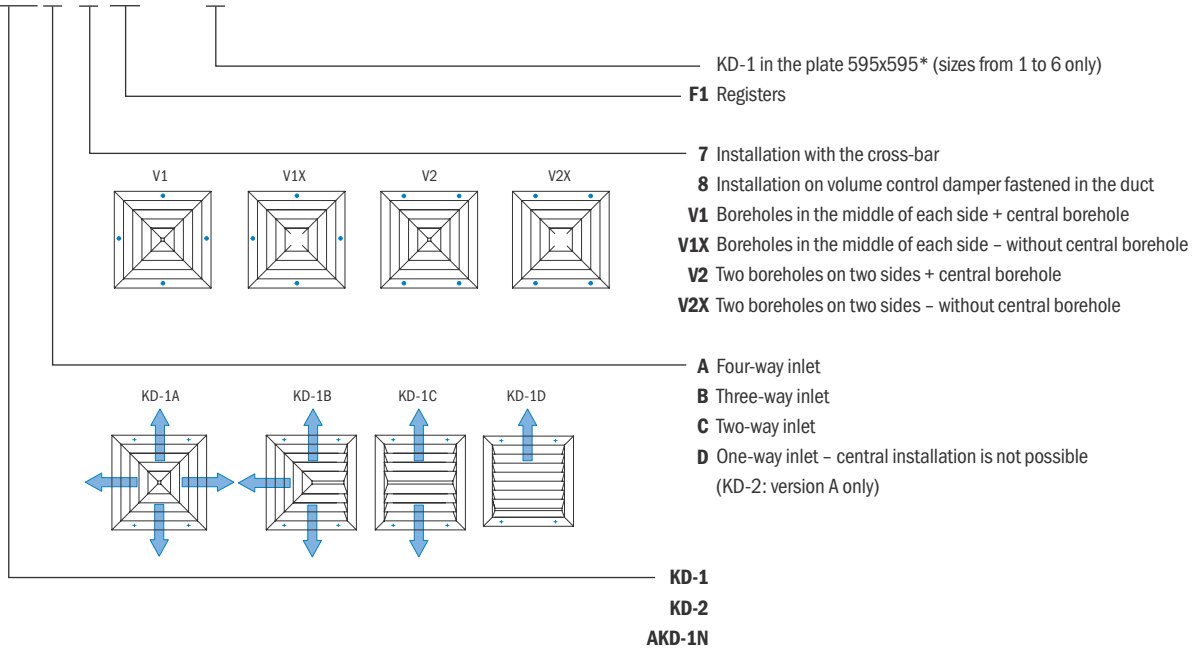
Size	A	A1	H1	h1	H2	Φd
1	230	240	185	112	200	98
2	280	298	210	125	200	123
3	325	353	240	137	200	158
4	390	408	290	167	240	198
5	390	464	290	167	240	198
6	590	493	325	177	240	248
7	590	593	390	210	300	313
8	590	619	390	210	300	313

Adapter is attached to the plenum boxes for sizes 5 and 6.



Ordering key

KD-1A/8-F1 Size 4 / 600

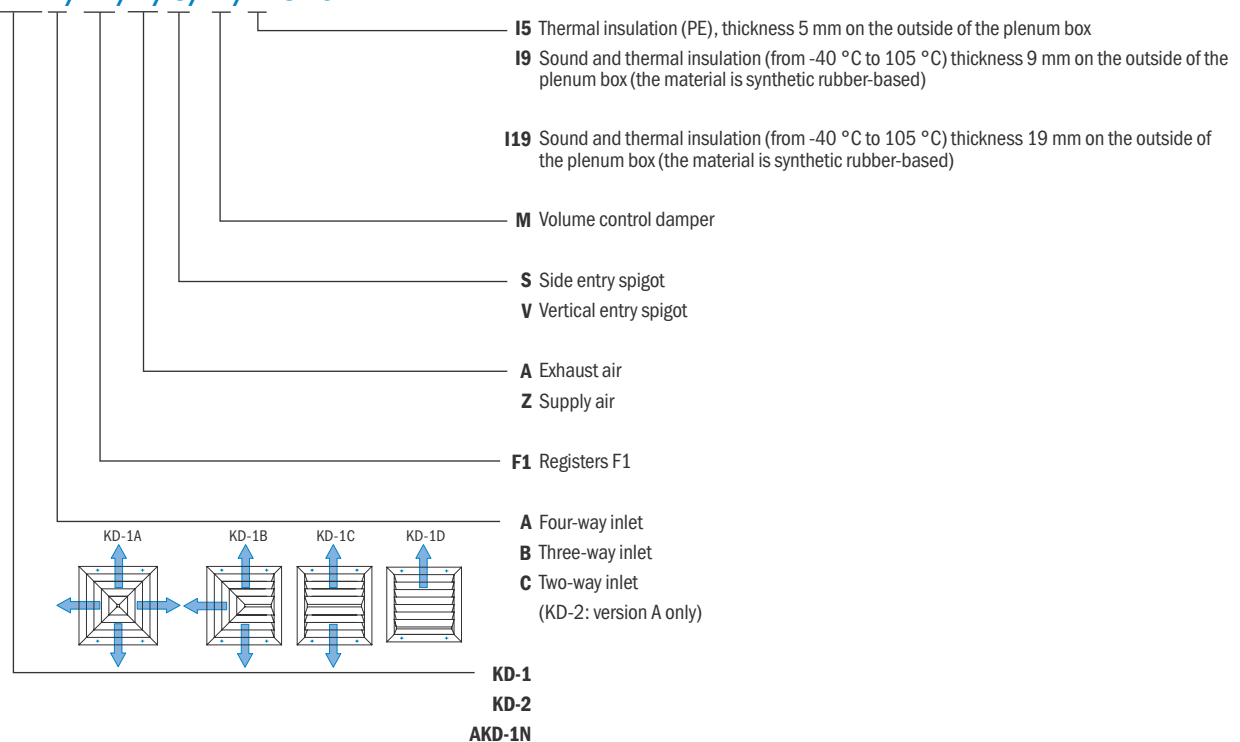


* Only installations number 7 and 8 are enabled if KD-1 version is installed into the plate.

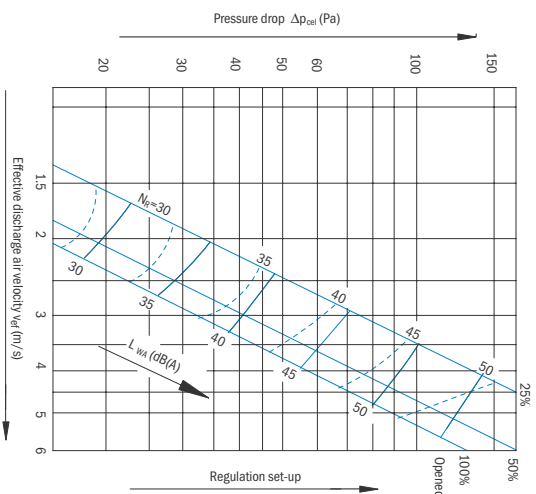
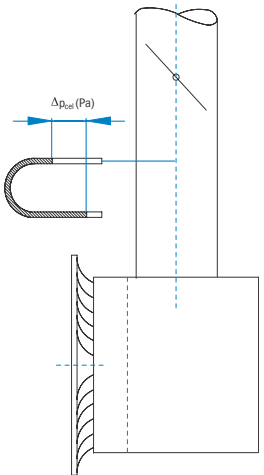
Ordering key

KD-1, KD-2, AKD-1N with plenum box

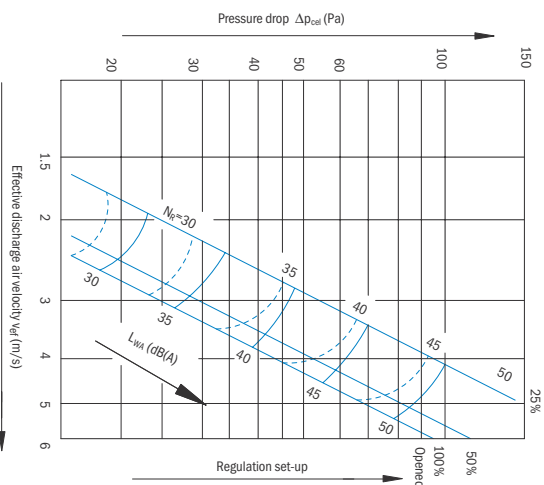
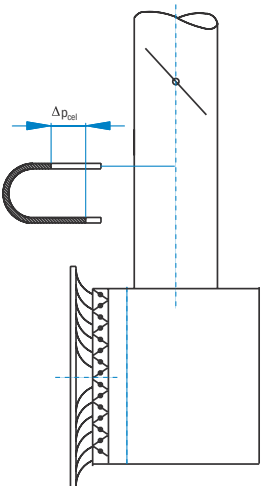
KD-1A/F1/A/S/M/I Size 4



Pressure drop and room attenuation diagram – with plenum box



Pressure drop and room attenuation diagram – with plenum box and control damper M (valid for the F1 register)

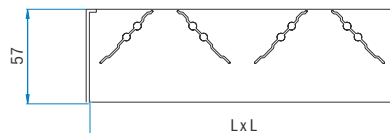


Registers

When adjusting the system, desired operating conditions are obtained by the means of ventilation elements control. Registers are installed for additional air volume control, thus influencing air velocity and throw distance as well. Registers are made of galvanised sheet steel.

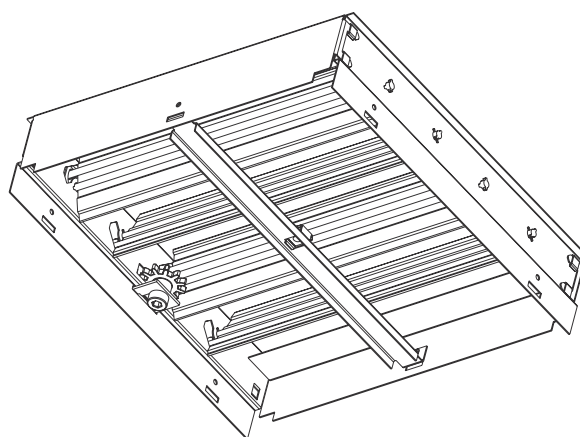
F1

Register F1 is equipped with wide counter-directional blades, which can be moved by the screwdriver via the cogwheel. It is designed to control the air flow volume. The blades are made of PVC – black colour.



Dimensions table for registers to fit KD-1 and KD-2

Size	L (mm)
1	140
2	196
3	252
4	308
5	364
6	394
7	494
8	519



Fast selection diagram for square diffuser KD-1A

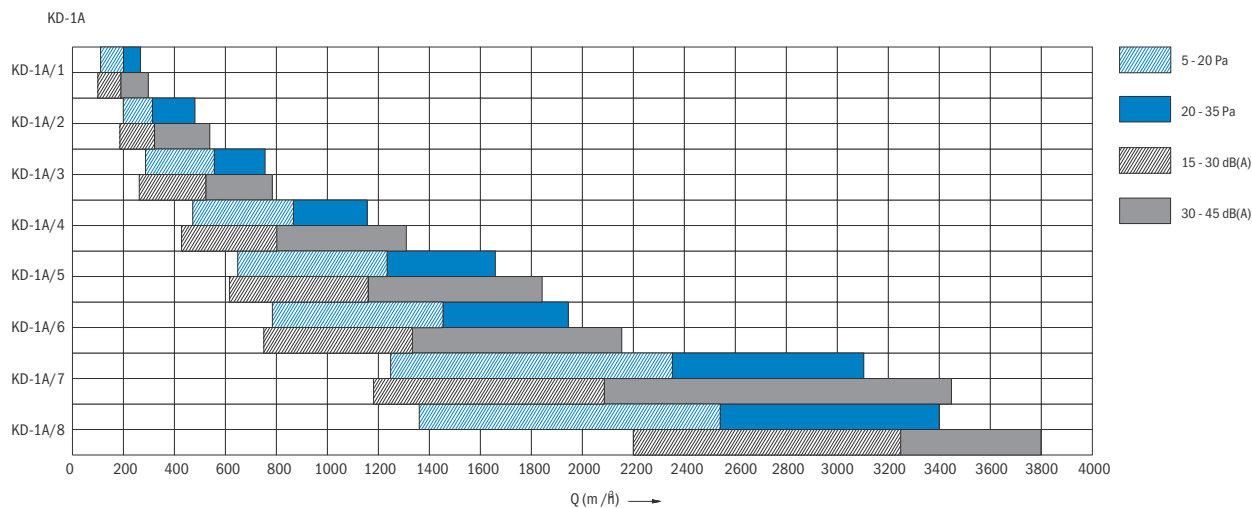
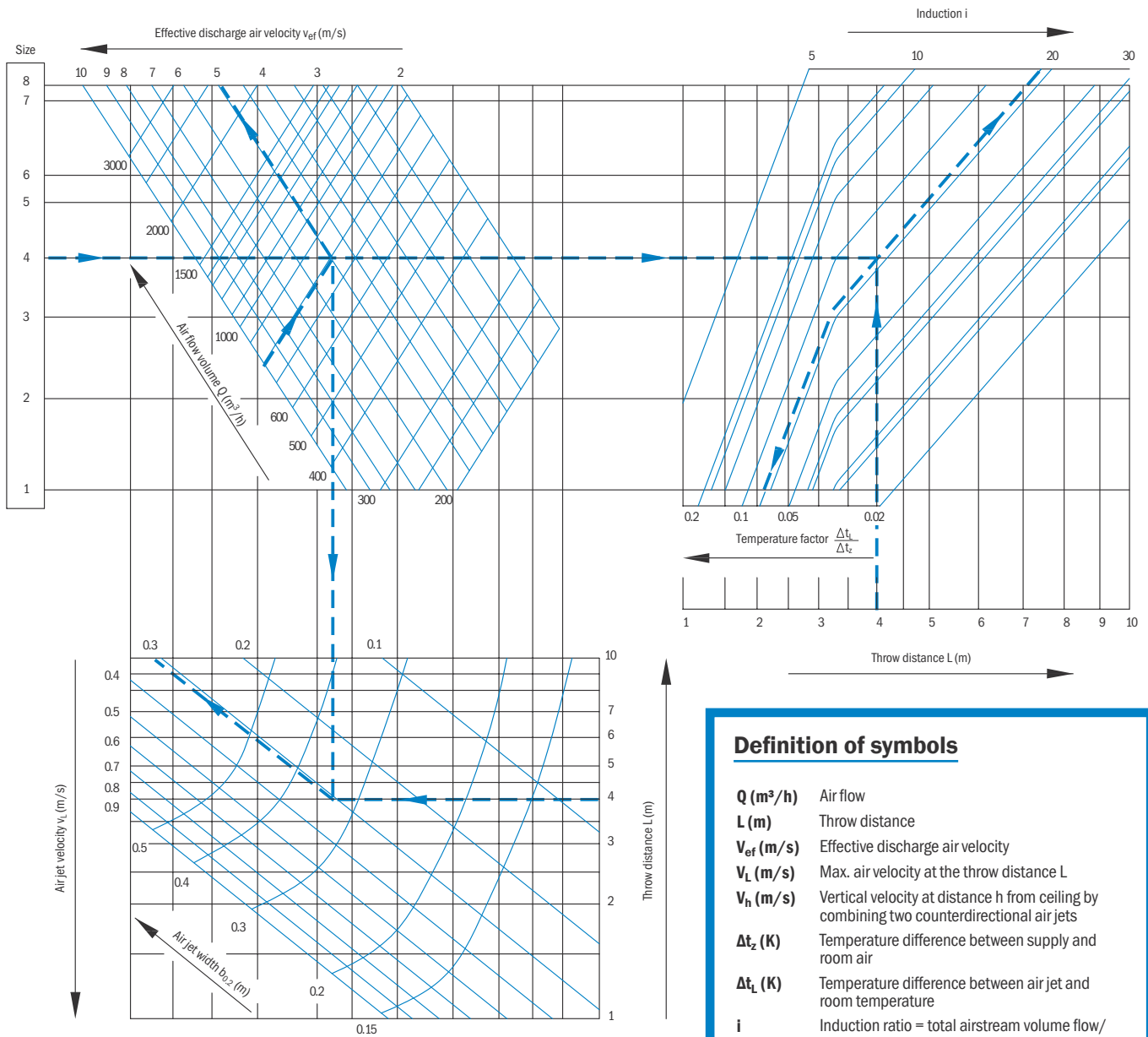


Diagram for determining the size, induction and temperature of the air jet flow of the square diffuser KD-1A



Definition of symbols

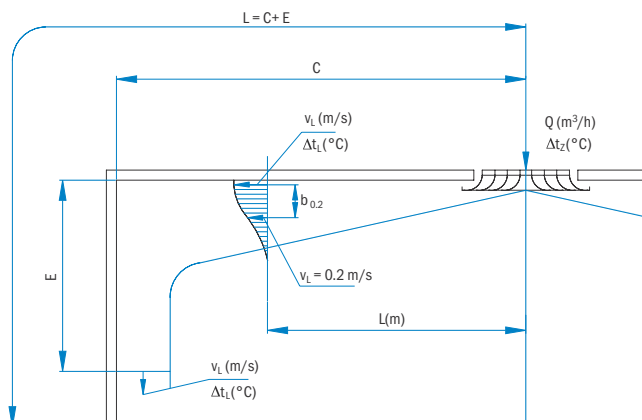
- Q (m³/h)** Air flow
- L (m)** Throw distance
- v_{ef} (m/s)** Effective discharge air velocity
- v_L (m/s)** Max. air velocity at the throw distance L
- v_h (m/s)** Vertical velocity at distance h from ceiling by combining two counterdirectional air jets
- Δt_z (K)** Temperature difference between supply and room air
- Δt_L (K)** Temperature difference between air jet and room temperature
- i** Induction ratio = total airstream volume flow/volume flow at diffuser discharge
- b_{0.2} (m)** Width of the air jet is measured at a distance from ceiling where air flow velocity is 0.2 m/s

Example:

Given:
Air flow volume: Q = 790 m³/h, L = 4 m
Temperature difference: Δt_z = 5 °C

Solution:
From the diagram select the diffuser KD-1 size 4.

Air jet velocity: v_L = 0.31 m/s
effective outlet velocity v_{ef} = 5 m/s
temperature quotient Δt_L/Δt_z = 0.080
temperature difference Δt_L = 0.080 x 5 = 0.4 °C
induction i = 18
width of the air jet b_{0.2} = 0.33 m



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LOUVERES

Diagram for determining the size, induction and temperature of the air jet flow of the square diffuser KD-1B

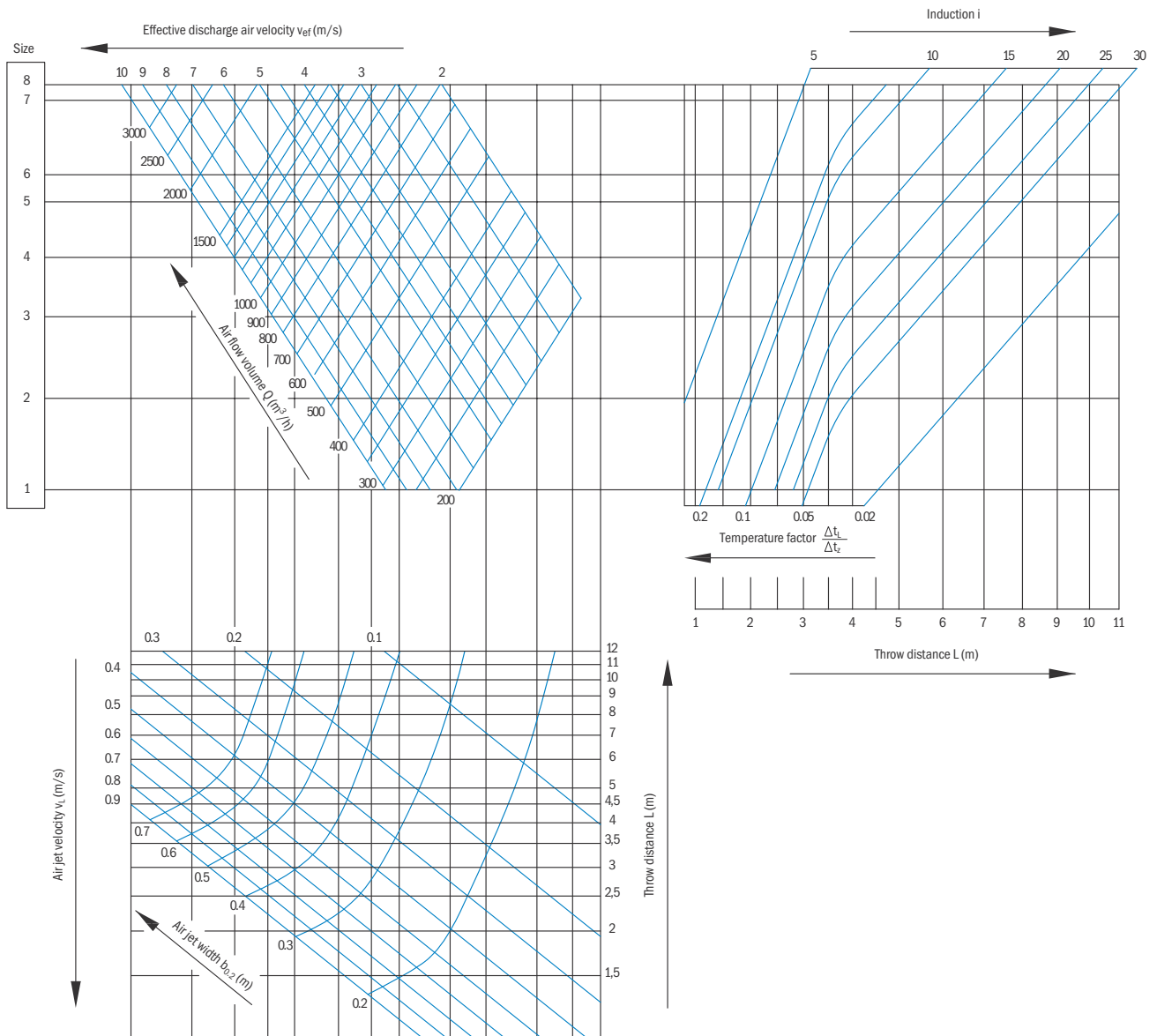
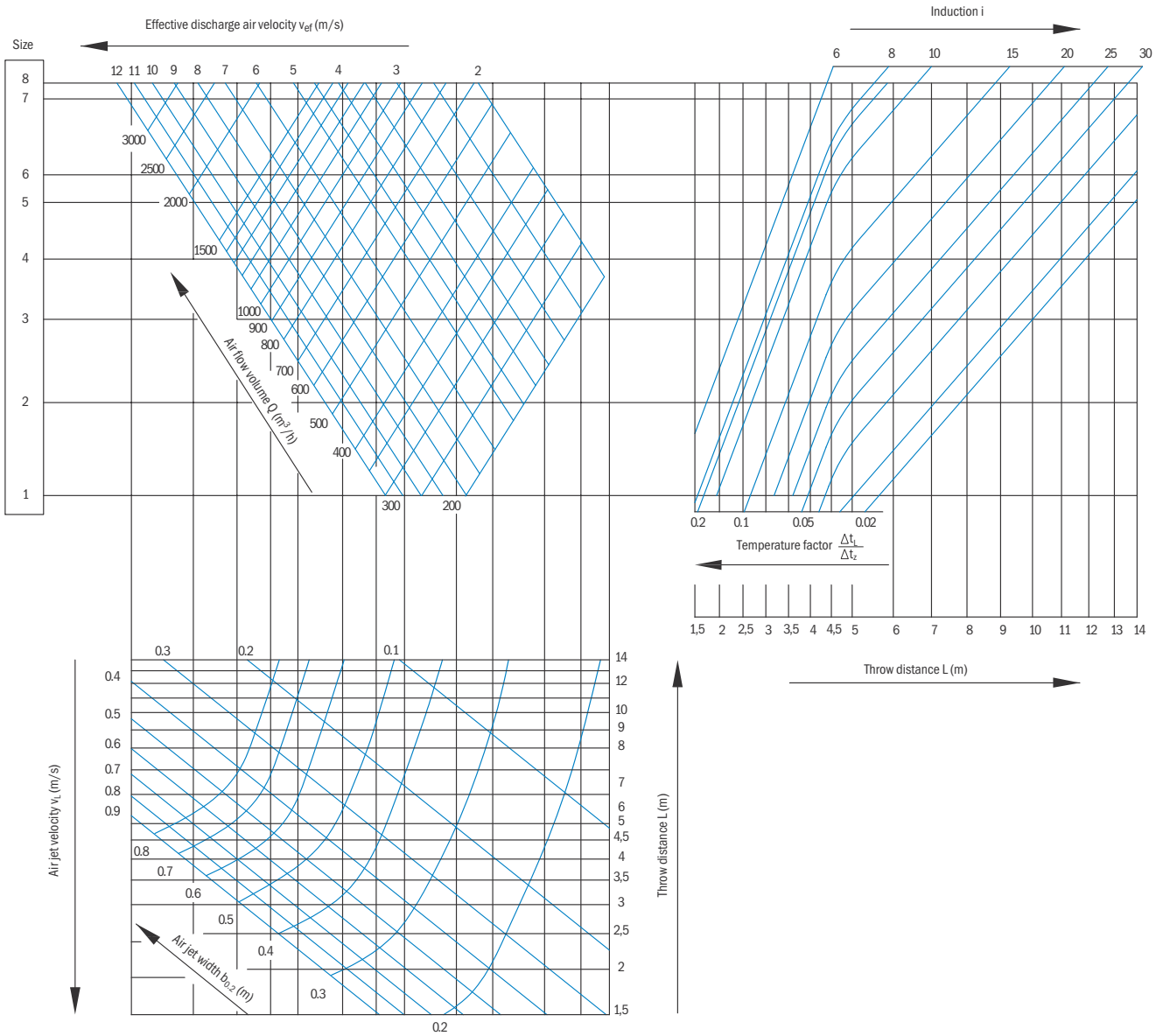


Diagram for determining the size, induction and temperature of the air jet flow of the square diffuser KD-1C



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LOUVRES

Diagram for determining the size, induction and temperature of the air jet flow of the square diffuser KD-1D

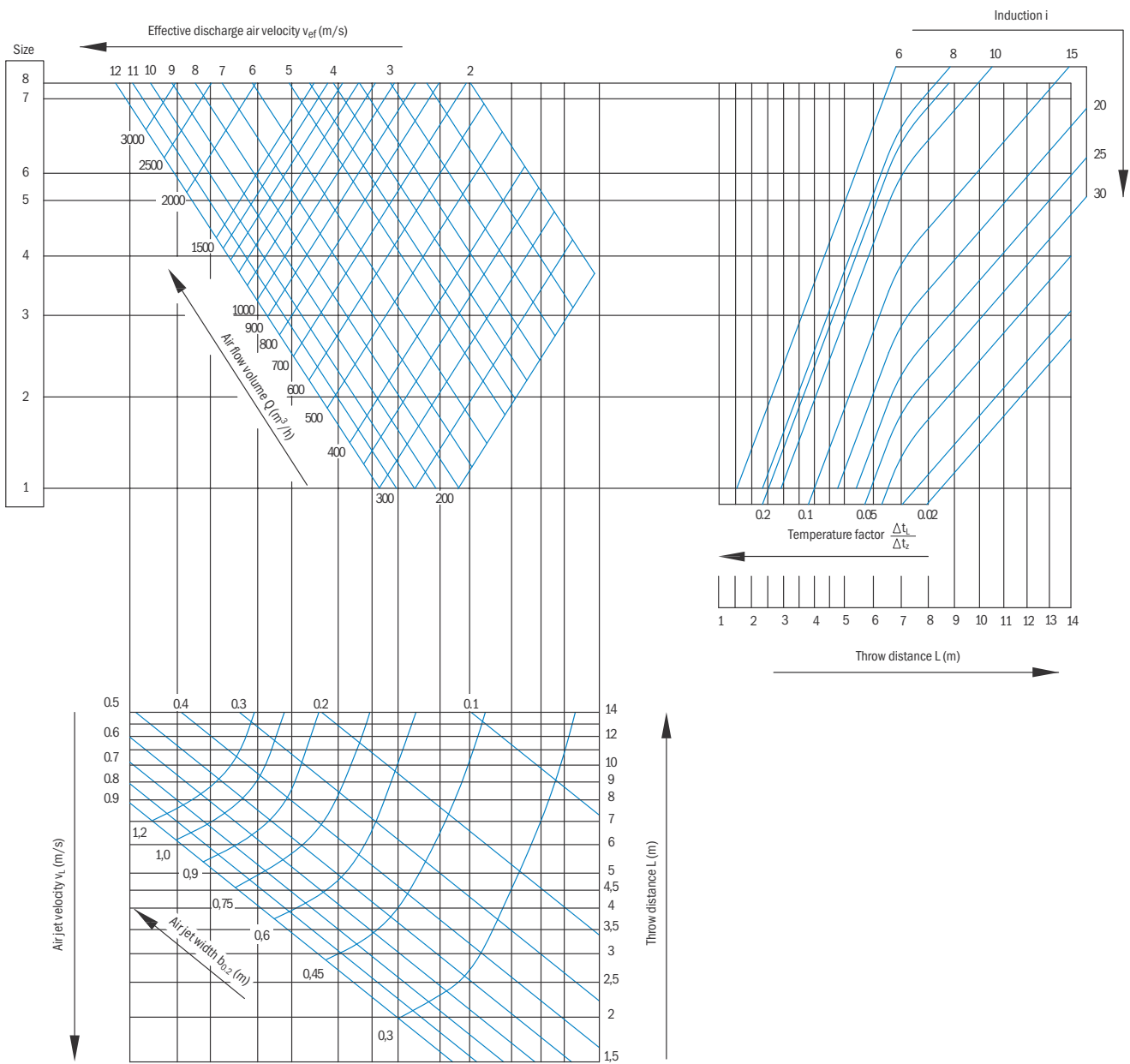
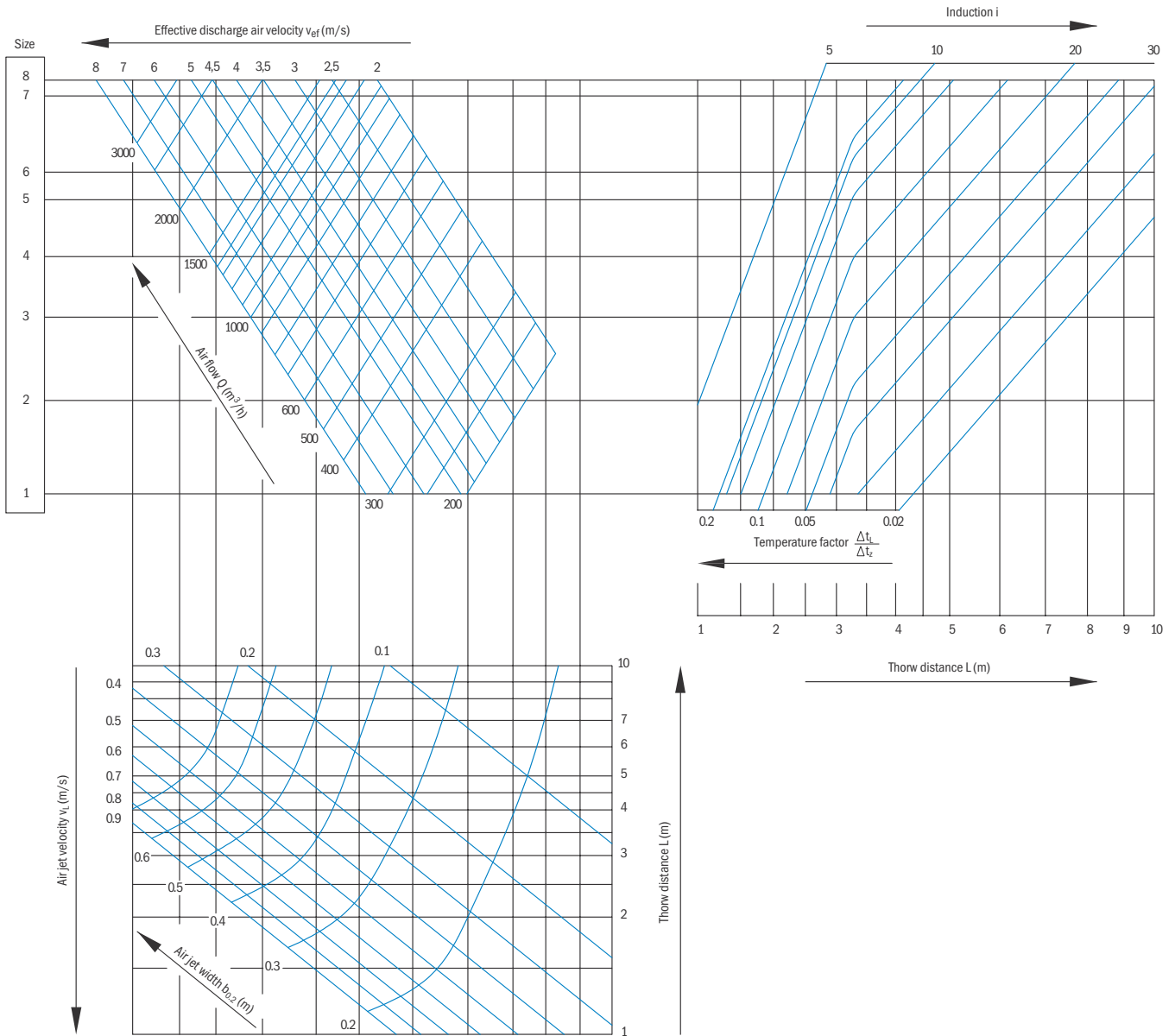


Diagram for determining the size, induction and temperature of the air jet flow of the square diffuser KD-2



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UNITS

SUPPLY AIR NOZZLES

EXTERNAL ELEMENTS

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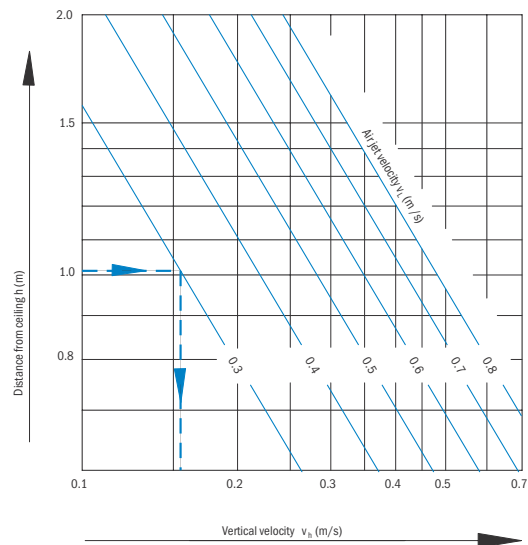
SOUND ATTENUATORS,
SOUND ATTENUATING
LOUVRES

Example

Max temperature quotient $\Delta t_h / \Delta t_z$ determined using the diagram 1 for temperature quotient:

$$L_{\text{diagram}} = L + h$$

Diagram for determination of vertical velocity

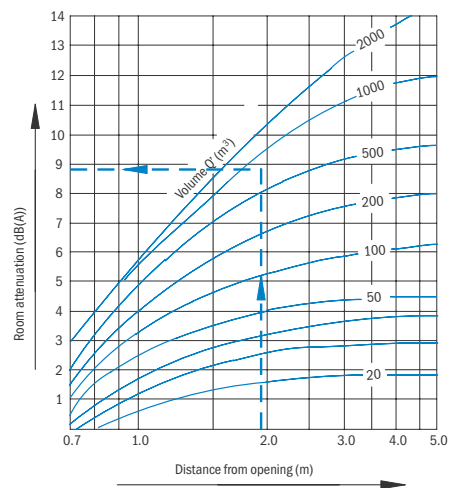


Q' (m³) calculated volume, depending on room reflectance
 Q (m³) actual room volume

The following data are necessary to calculate the volume Q' :

1. Normal rooms $Q' = Q$
2. Rooms with highly reflective walls $Q' = 0.5Q$
3. Rooms with absorption walls $Q' = 2Q$

Room attenuation diagram



Definition of symbols

Δp_t (Pa) Pressure drop
 L_{WA} (dB(A)) Sound power level
 N_R Max. value according to ISO

Pressure drop and room attenuation diagram – directly connected to the duct (valid for the F1 register)

