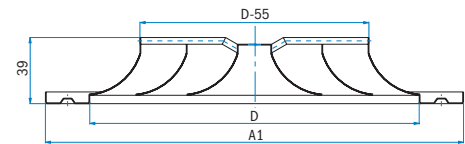


# Circular diffusers

## ■ Circular diffusers OD-1, OD-2

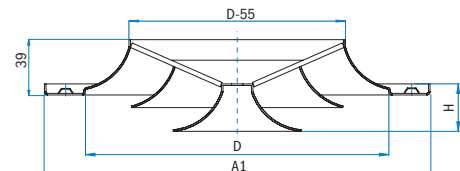
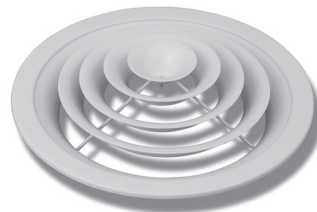
### OD-1

- Fixed diffuser rings
- Central screw installation or fixing with three peripheral screws
- Peripheral foamy sealing strip
- Registers J2, L2



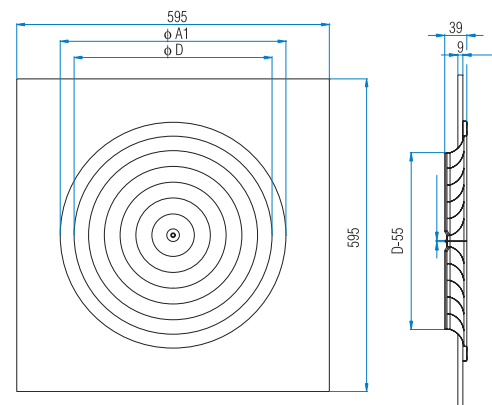
### OD-2

- Fixed diffuser cone-form rings
- Central screw installation or fastening with three peripheral screws
- Peripheral foamy sealing strip
- Registers J2, L2



### OD-1 in the plate

- OD-1 in the plate 595x595
- Sizes from 1 to 5 are available
- Only installation with cross-bar is possible
- Plenum boxes are equal to those for standard OD-1 corresponding nominal sizes



### OD-1 and OD-2 dimensions

Size	D (mm)	A1 (mm)	H (mm)	OD-1 A <sub>ef</sub> (m <sup>2</sup> )	OD-2 A <sub>ef</sub> (m <sup>2</sup> )
1	192	244	30	0.0085	0.0090
2	248	300	45	0.0157	0.0167
3	304	356	60	0.0257	0.0282
4	360	412	75	0.0381	0.0422
5	416	468	90	0.0536	0.0618
6	472	542	98	0.0730	0.0812
7	528	598	112	0.0955	0.1037
8	584	654	126	0.1150	0.1235

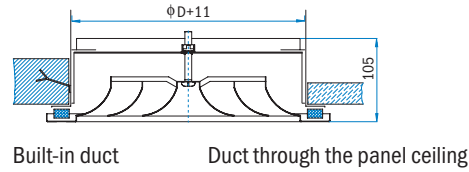
### Dimensions of volume control dampers L2, J2 for OD-1 and OD-2

Size	ΦD-52 (mm)	ΦD+11 (mm)
1	140	203
2	196	259
3	252	315
4	308	371
5	364	427
6	420	483
7	476	539
8	532	595

### Installation of circular diffusers OD-1, OD-2

#### Installation 7

- Installation with crossbar.  
Designation: **OD-1/7, OD-2/7**

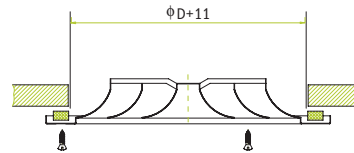


#### Installation 8

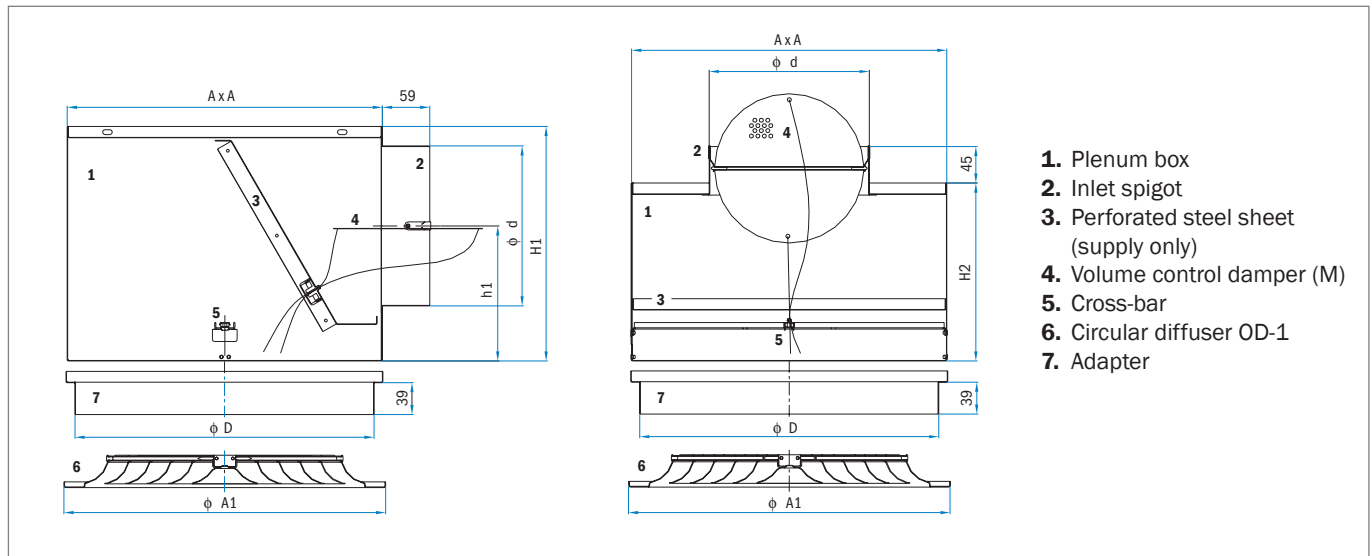
- Installation on register fastened in the duct.  
Register has three girders.  
Designation: **OD-1/8-(L2, J2), OD-2/8-(L2, J2)**

#### Installation X (without opening in the middle)

- Direct installation in the ceiling with three screws  
Designation: **OD-1/X, OD-2/X**

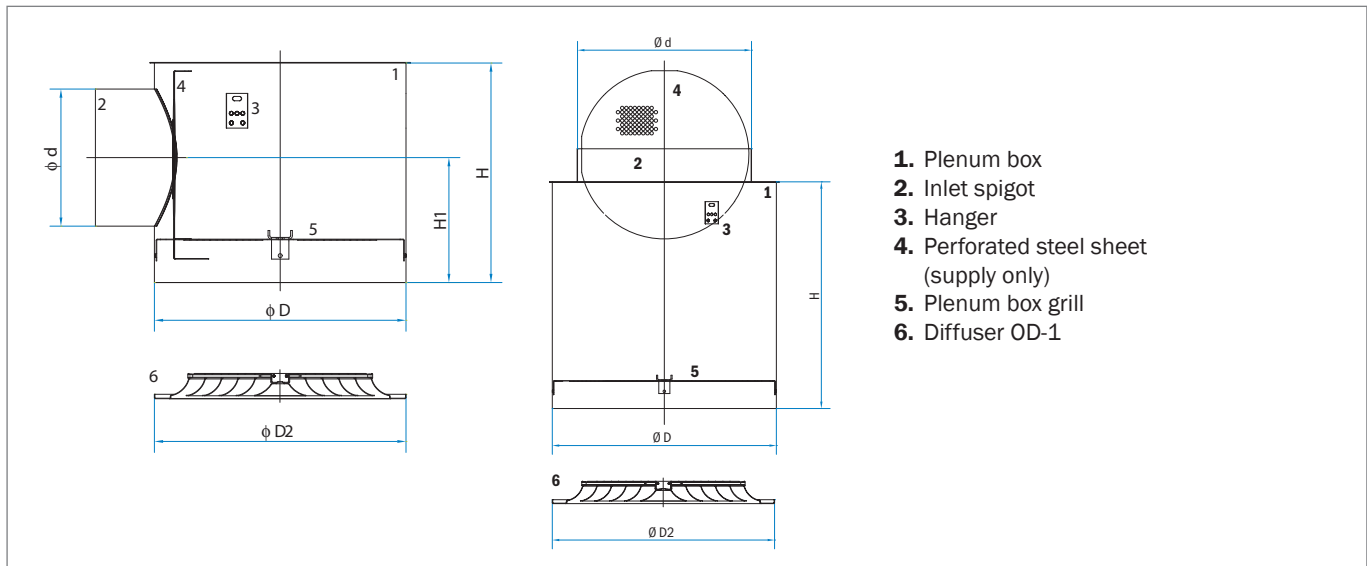


### Installation of OD-1 and OD-2 with plenum box



Size	A	$\phi A1$	H1	h1	H2	$\phi D$	$\phi d$
1	280	244	210	125	200	204	123
2	325	300	240	137	200	260	158
3	390	356	290	167	240	319	198
4	390	412	290	167	240	370	198
5	590	468	325	177	240	430	248
6	590	542	325	177	240	488	248
7	590	598	325	177	240	540	248
8	815	654	450	250	300	596	313

**Round diffuser OD-1 (side and vertical air supply)**

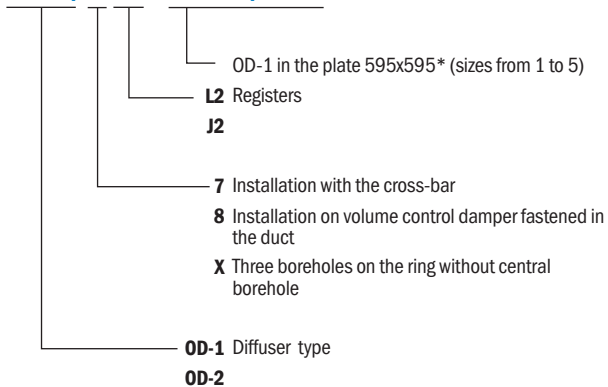


1. Plenum box
2. Inlet spigot
3. Hanger
4. Perforated steel sheet (supply only)
5. Plenum box grill
6. Diffuser OD-1

Size	$\phi D$	$\phi d$	H	H1	H2
1	204	123	210	125.5	210
2	260	158	245	143	245
3	319	198	285	163	280
4	370	198	285	163	280
5	430	248	335	188	330
6	488	248	335	188	330
7	540	248	335	188	330
8	596	313	400	220.5	395

**Ordering key**

**OD-1/7-J2 Size 2 / 600**

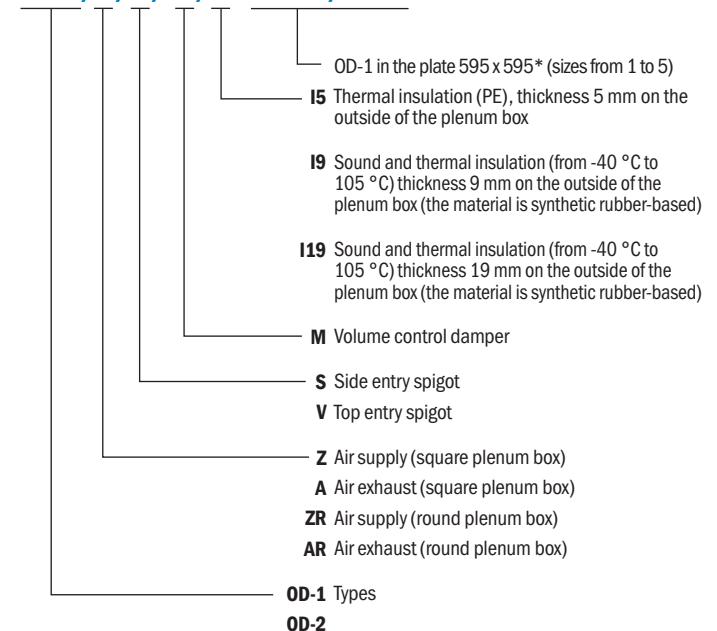


\* Only installation number 7 is enabled if OD-1 version is installed into the plate.

**Ordering key**

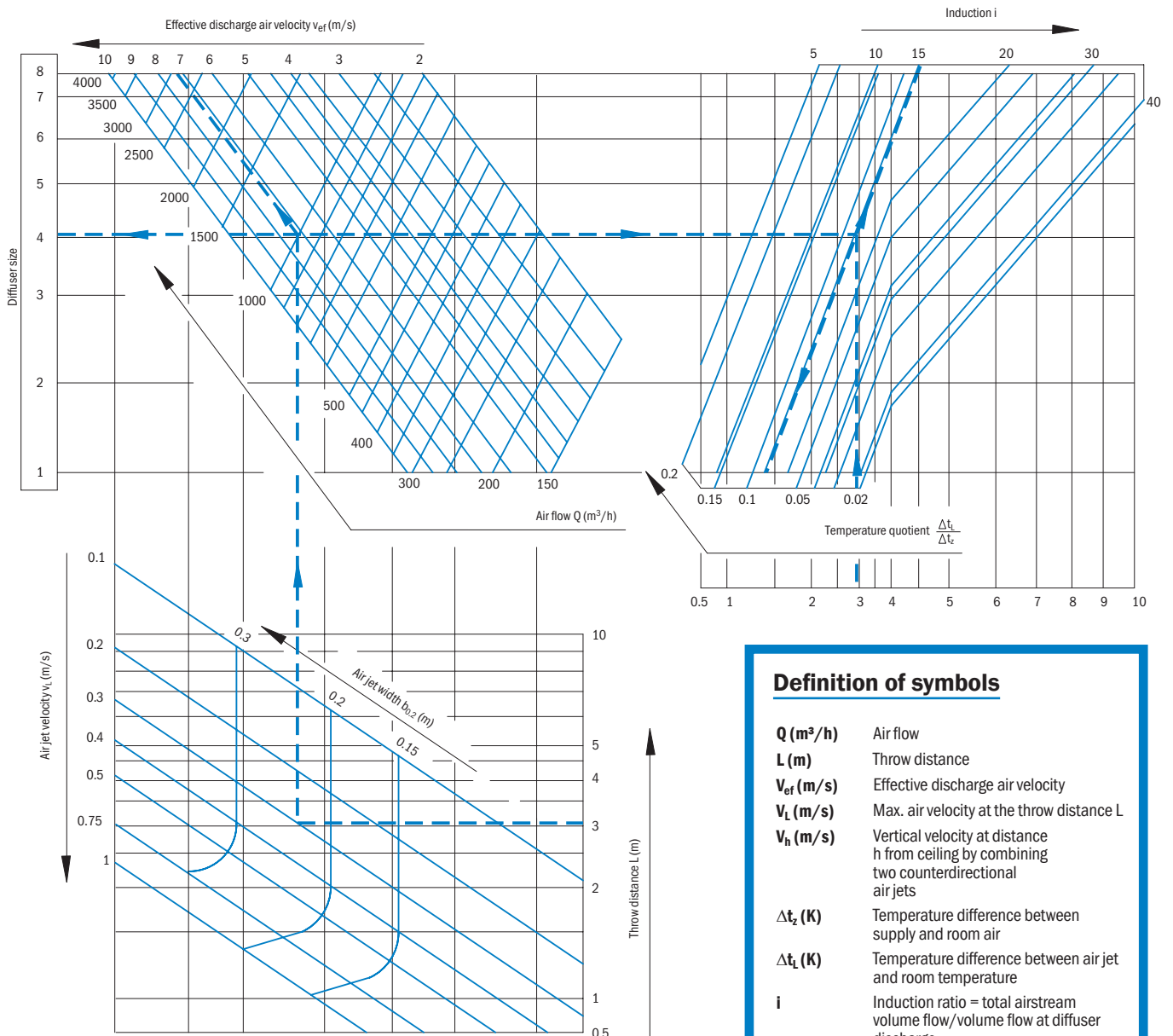
for OD-1, OD-2 with plenum box

**OD-1/Z/S/M/I Size 2 / 600**



\*Only central installation can be used when installing on a plenum box.

Diagram for determining the size, induction and temperature of the air jet flow of the circular diffusers OD-1



### Definition of symbols

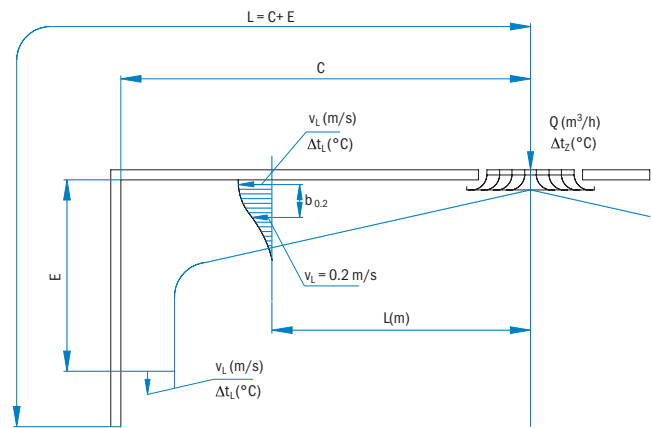
<b>Q (m<sup>3</sup>/h)</b>	Air flow
<b>L (m)</b>	Throw distance
<b><math>v_{ef}</math> (m/s)</b>	Effective discharge air velocity
<b><math>v_L</math> (m/s)</b>	Max. air velocity at the throw distance L
<b><math>v_h</math> (m/s)</b>	Vertical velocity at distance h from ceiling by combining two counterdirectional air jets
<b><math>\Delta t_r</math> (K)</b>	Temperature difference between supply and room air
<b><math>\Delta t_t</math> (K)</b>	Temperature difference between air jet and room temperature
<b>i</b>	Induction ratio = total airstream volume flow/volume flow at diffuser discharge
<b><math>b_{0.2}</math> (m)</b>	Width of the air jet is measured at a distance from ceiling where air flow velocity is 0.2 m/s

**Example**

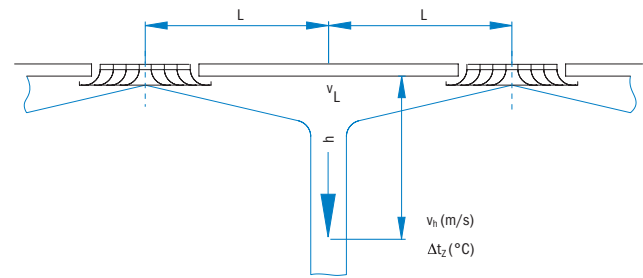
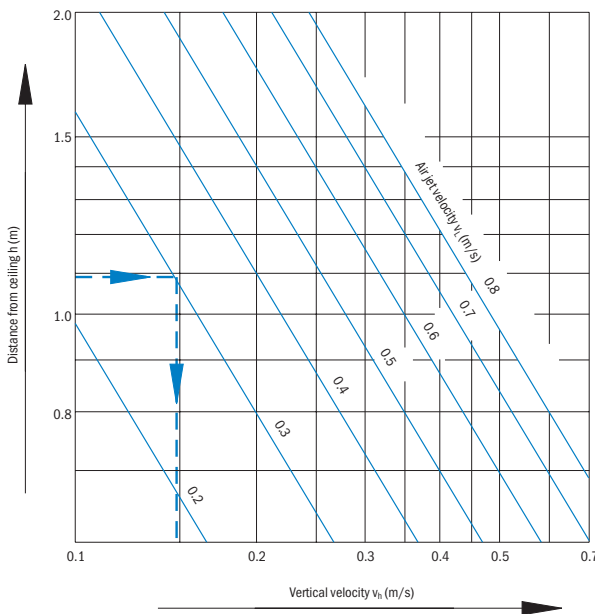
**Given:**  
 Air flow:  $Q = 1000 \text{ m}^3/\text{h}$ ,  $L = 3 \text{ m}$   
 Air jet velocity:  $V_L = 0.3 \text{ m/s}$   
 Temperature difference:  $\Delta t_2 = 5 \text{ }^\circ\text{C}$

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

effective outlet velocity  $v_{ef} = 7.2 \text{ m/s}$   
 temperature quotient  $\Delta t_1 / \Delta t_2 = 0.08$   
 temperature difference  $\Delta t_1 = 0.08 \times 5 = 0.4 \text{ }^\circ\text{C}$   
 induction  $i = 16$   
 width of the air jet  $b_{0.2} = 0.22 \text{ m}$



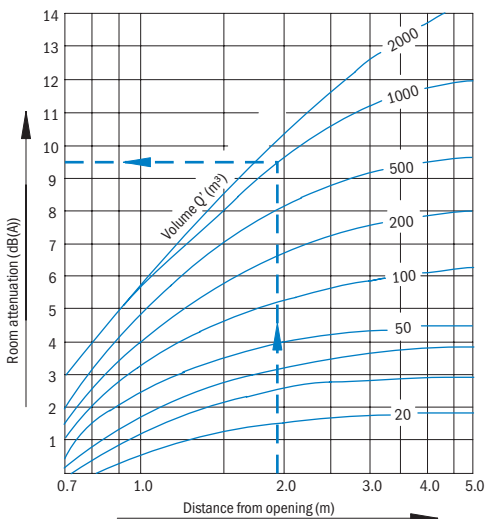
**Diagram for determination of vertical velocity**



Max temperature quotient  $\Delta t_1 / \Delta t_2$  determined using the diagram 1 for temperature quotient:

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

**Room attenuation diagram**



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

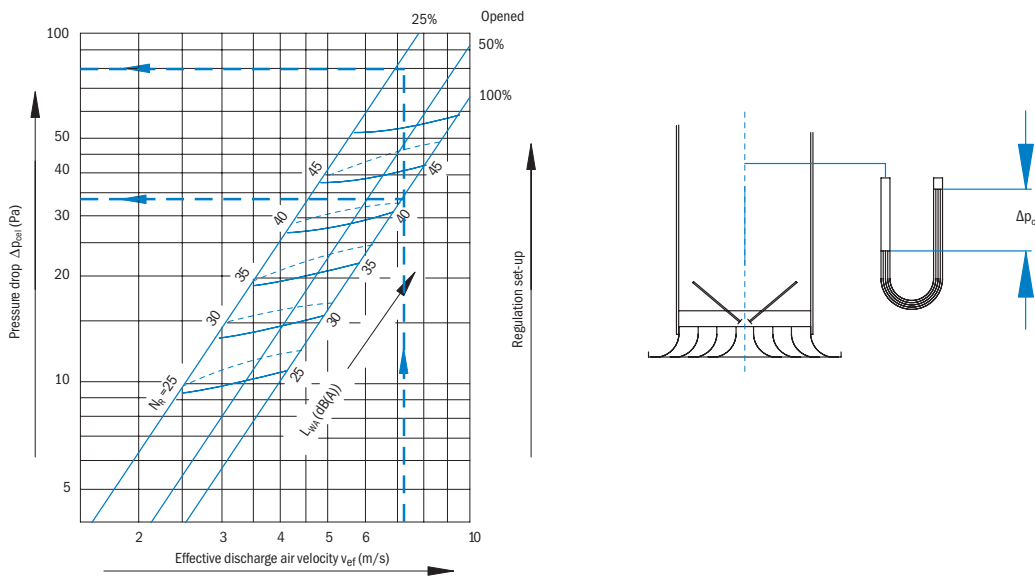
The following data are necessary to calculate the volume  $Q'$ .

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

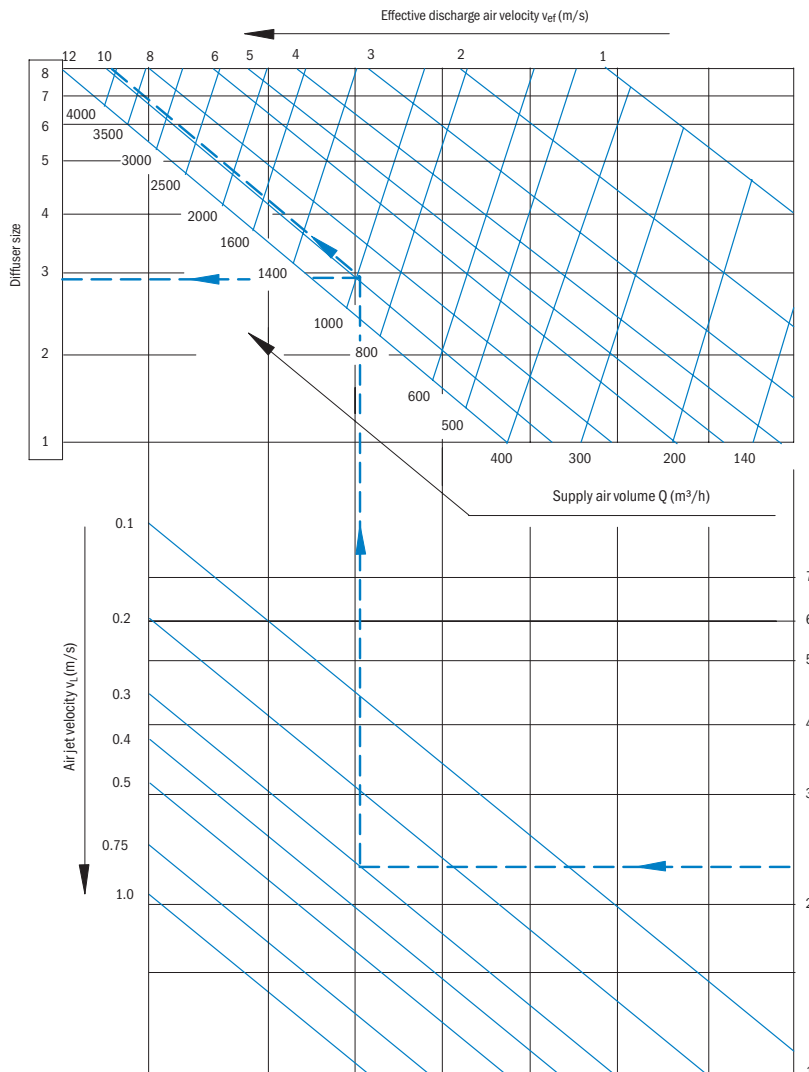
**Definition of symbols**

- $\Delta p_{\text{cel}}$  (Pa) Pressure drop
- $L_{\text{WA}}$  (dB(A)) Sound power level
- $N_R$  Max. value according to ISO

**Pressure drop diagram** (Valid for volume control damper J2)



**Sizing diagram for circular diffusers OD-2**



**Definition of symbols**

<b>Q (m<sup>3</sup>/h)</b>	Air flow
<b>L (m)</b>	Throw distance
<b>v<sub>ef</sub> (m/s)</b>	Effective discharge air velocity
<b>v<sub>L</sub> (m/s)</b>	Max. air velocity at the throw distance L
<b>v<sub>h</sub> (m/s)</b>	Vertical velocity at distance h from ceiling by combining two counterdirectional air jets
<b>Δt<sub>z</sub> (K)</b>	Temperature difference between supply and room air
<b>Δt<sub>i</sub> (K)</b>	Temperature difference between air jet and room temperature
<b>i</b>	Induction ratio = total air stream volume flow/volume flow at diffuser discharge
<b>b<sub>0.2</sub> (m)</b>	Width of the air jet is measured at a distance from ceiling where air flow velocity is 0.2 m/s
<b>Δp<sub>cel</sub> (Pa)</b>	Pressure drop
<b>L<sub>WA</sub> (dB(A))</b>	Sound power level
<b>N<sub>R</sub></b>	Border value according to ISO

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

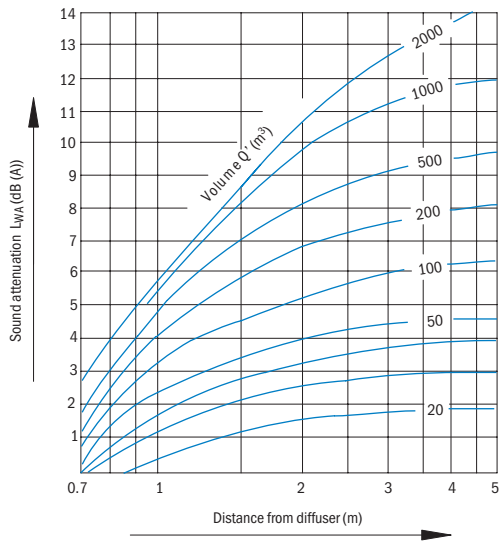
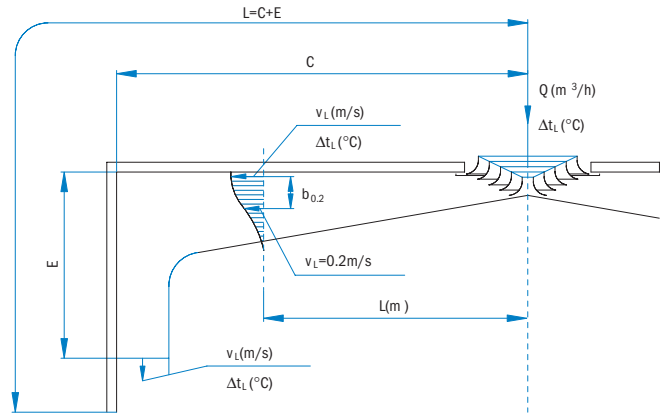
AIR FLOW  
CONTROL UNITS

SOUND ATTENUATORS,  
SOUND ATTENUATING  
LOUVRES

**Example**

**Given:**  
 Air flow volume:  $Q = 1000 \text{ m}^3/\text{h}$ ,  $L = 2.4 \text{ m}$   
 Air jet velocity:  $V_L = 0.3 \text{ m/s}$   
 Temperature difference:  $\Delta t_z = 5 \text{ }^\circ\text{C}$

**Solution:**  
 From the diagram select the diffuser OD-2 size 3.  
 Effective discharge velocity  $v_{ef} = 9.8 \text{ m/s}$



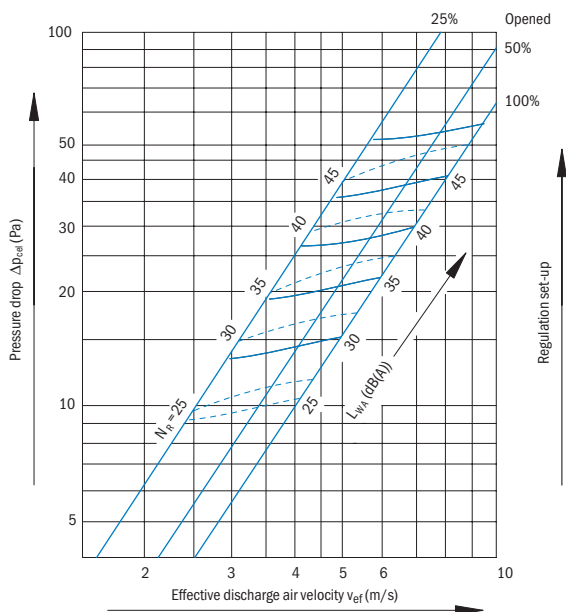
**Diagram for approximate determination of room attenuation**

$Q'$  (m<sup>3</sup>)    Calculated volume, depending on room reflectance  
 $Q$  (m<sup>3</sup>)    Actual room volume

The following data are necessary to calculate the volume  $Q'$ .

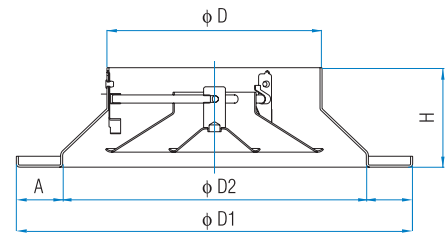
1. Normal rooms  $Q' = Q$
2. Rooms with highly reflective walls  $Q' = 0.5Q$
3. Rooms with absorption walls  $Q' = 2Q$

**Pressure drop diagram (Valid for register J2)**



## ■ Circular diffusers OD-3N

- Dismountable and height adjustable diffuser core (two positions).
- Installation with a mounting base collar.
- Two designs:
  - aluminium sheet, painted in white RAL 9010,
  - aluminium sheet, eloxal treated in natural aluminium colour.



### Application

The diffuser core has two setting positions. In the upper position, the jet is directed downwards, for warm air heating application; in the lower position, the jet is directed horizontally, for cooling applications.

For duct cleaning, only the diffuser core is to be dismantled.

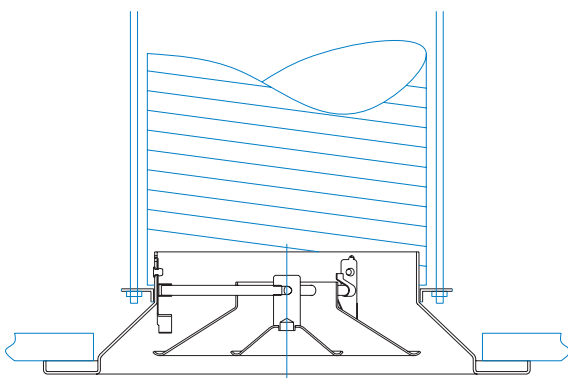
OD-3N has a capacity to supply large volumes of air.

Table of dimensions:

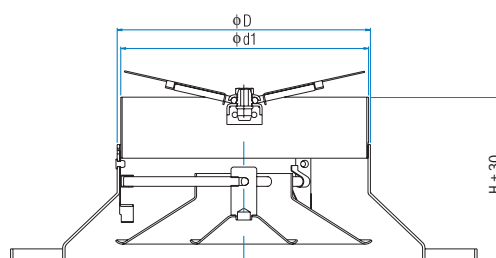
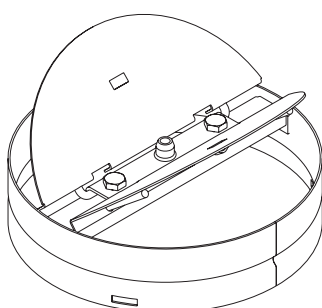
Size	$\phi D$	$\phi D1$	$\phi D2$	A	H
100	98	225	165	30	67
160	158	291	223	34	73
200	198	378	302	38	77
250	248	454	368	43	86
315	313	537	441	48	94
355	353	624	518	53	98
400	398	704	588	58	125
450	448	788	662	63	133
500	498	872	736	68	145
630	628	1063	927	68	162
710	708	1180	1044	68	172
800	798	1323	1177	73	198
900	898	1470	1324	73	211

### Mounting

- Direct mounting on a circular duct or hose without additional adjustment fittings.



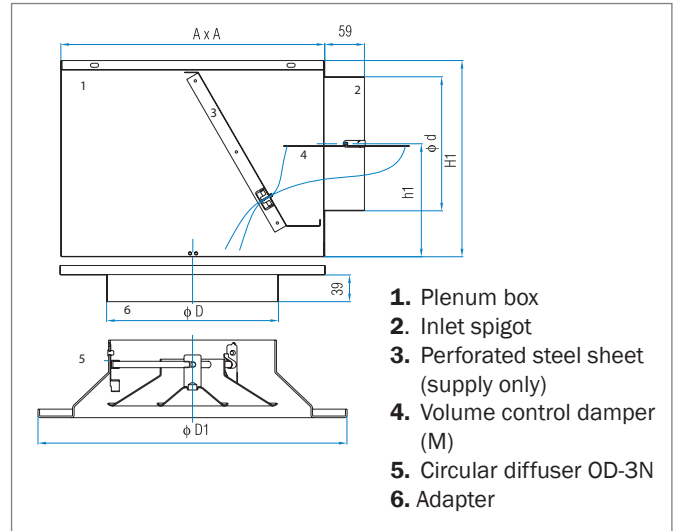
- Mounting on a circular duct – adjustment with a J2 adjustment fitting (for sizes 160 to 500).





**Mounting with a connection plenum box (for sizes up to 500):**

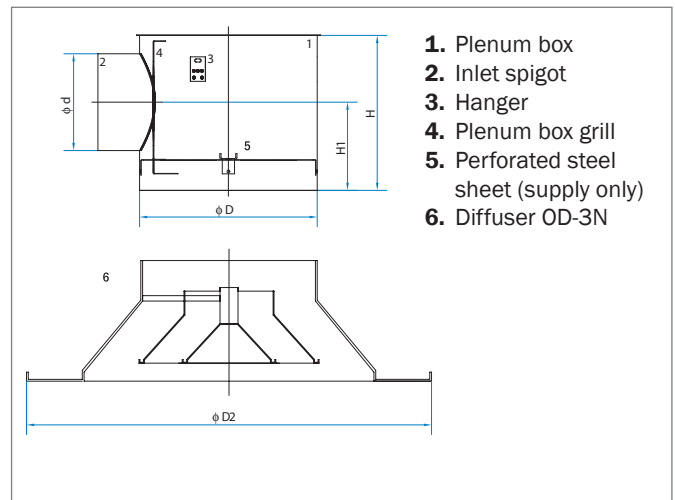
Size	A	H1	h1	Φd	ΦD	ΦD1	Φd1	H+30
100	230	185	112	98	103	225	—	97
160 200	280	210	125	123	163	291	154	103
					204	378	194	107
250	390	290	167	198	254	454	244	116
315 355	590	325	177	248	319	537	309	124
					358	624	349	128
400	590	390	210	313	404	704	394	155
450					454	788	444	163
500					504	872	494	175



1. Plenum box
2. Inlet spigot
3. Perforated steel sheet (supply only)
4. Volume control damper (M)
5. Circular diffuser OD-3N
6. Adapter

**Swirl diffusers OD-3N (air inlet on the side):**

Size	Φ D	Φ D2	Φ d	H	H1
100	103	225	98	185	113
160	163	291	123	210	125.5
200	204	378	123	210	125.5
250	254	454	198	285	163
315	319	537	248	335	188
355	358	624	248	335	188
400	404	704	313	400	220.5
450	454	788	313	400	220.5
500	504	872	313	400	220.5



1. Plenum box
2. Inlet spigot
3. Hanger
4. Plenum box grill
5. Perforated steel sheet (supply only)
6. Diffuser OD-3N

**Ordering key**

**OD-3N/J2/K/M/I Size 160**

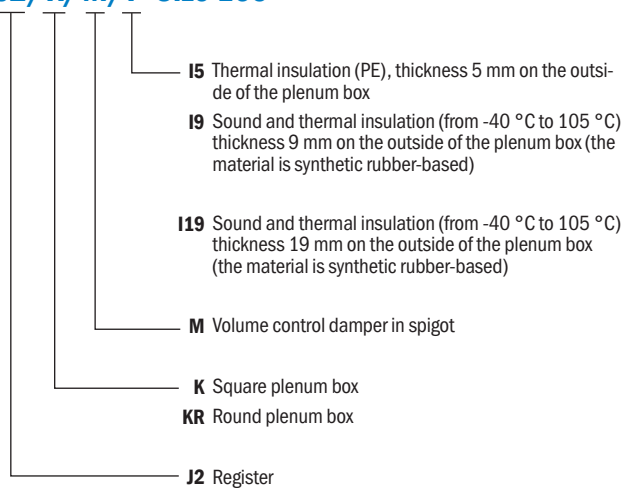
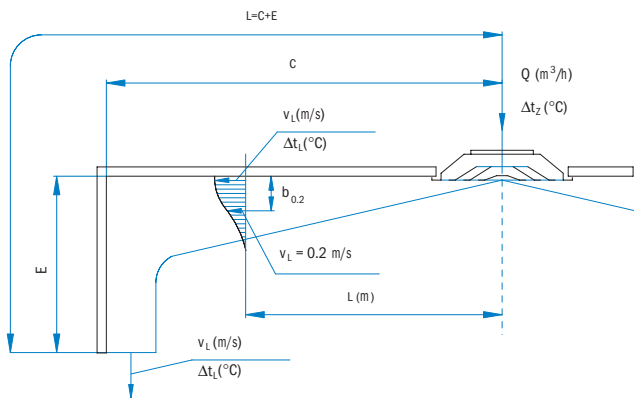
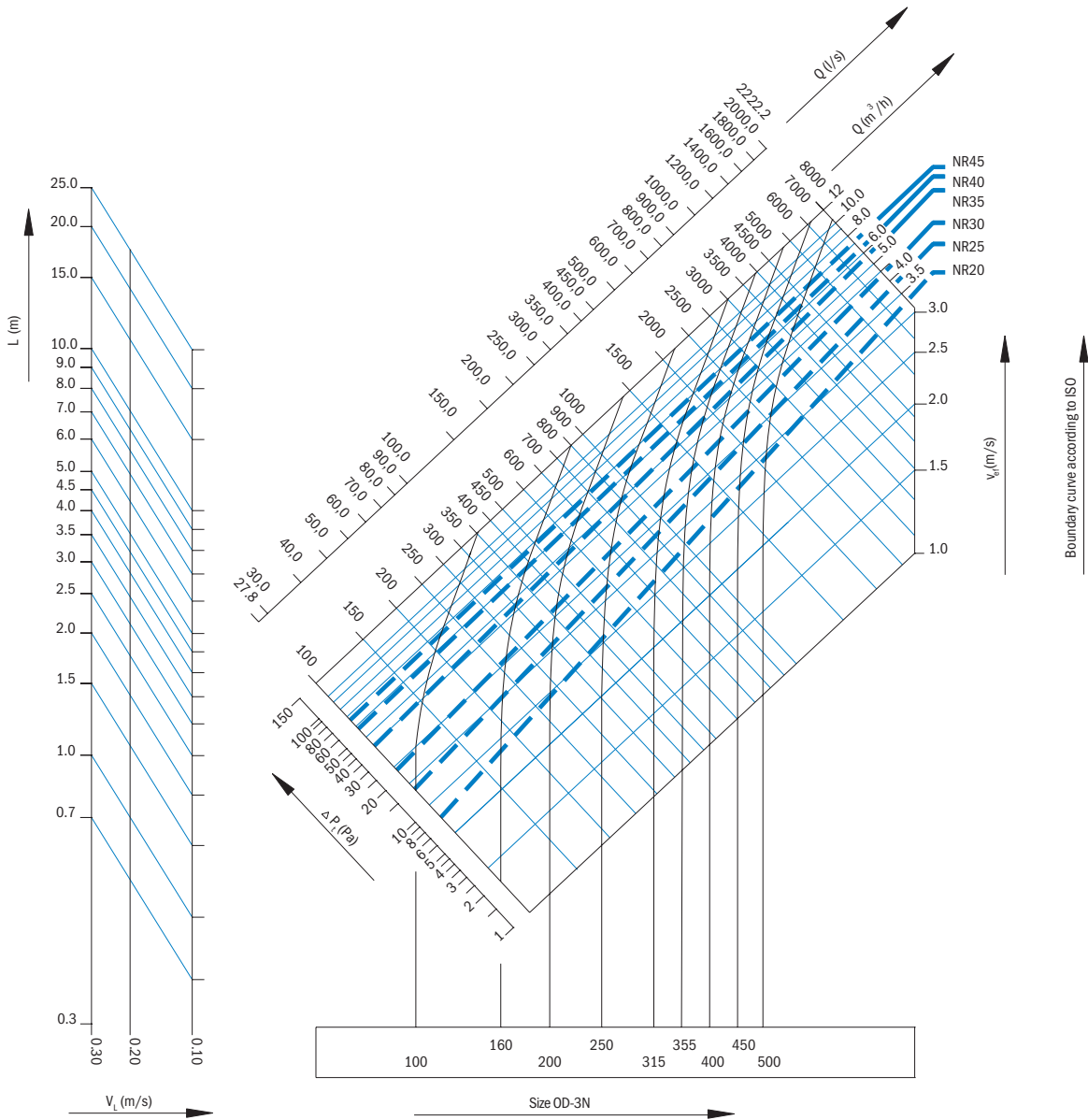


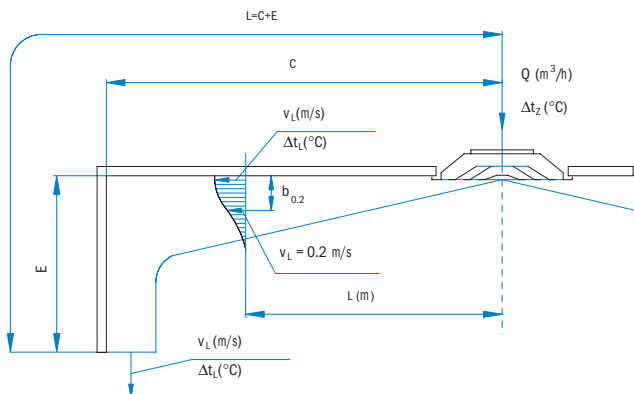
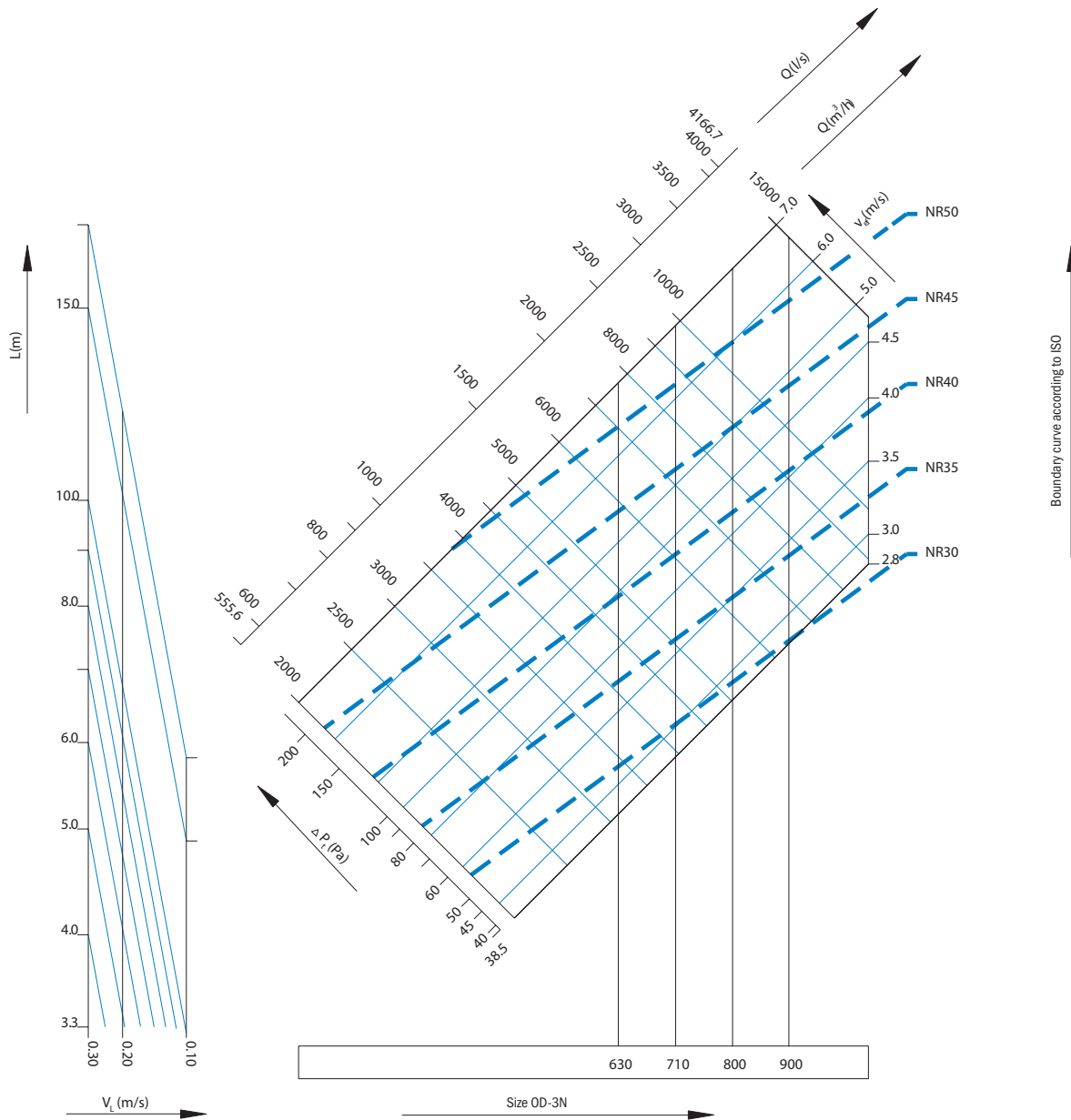
Diagram for the determination of technical characteristics at horizontal jets (sizes 100 to 500)



### Definition of symbols

<b>Q (l/s)</b>	Volume flow rate
<b>Q (m³/h)</b>	Volume flow rate
<b>L (m)</b>	Distance L
<b>V<sub>eff</sub> (m/s)</b>	Effective velocity
<b>V<sub>L</sub> (m/s)</b>	Air jet maximum velocity at throw distance L
<b>Δp<sub>t</sub> (Pa)</b>	Pressure drop
<b>N<sub>R</sub></b>	Boundary curve according to ISO

Diagram for the determination of technical characteristics at horizontal jets (sizes 630 to 900)



Definition of symbols	
<b>Q (l/s)</b>	Volume flow rate
<b>Q (m³/h)</b>	Volume flow rate
<b>L (m)</b>	Distance L
<b><math>v_{er}</math> (m/s)</b>	Effective velocity
<b><math>v_L</math> (m/s)</b>	Air jet maximum velocity at throw distance L
<b><math>\Delta p_t</math> (Pa)</b>	Pressure drop
<b><math>N_R</math></b>	Boundary curve according to ISO

## 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.

### J2

Register J2 has two separately adjustable deflector flaps. It is used to deflect and control air flow from the duct. Central installation of circular diffuser on built-in crossbar is also possible.

### L2

Element without regulation facilities is designed for the central installation of circular diffuser. Crossbar is a component part of L2. Picture shows L2/8 – angle irons for duct installation.

