DISPLACEMENT DIFFUSER
PERFORATED

D.T TYPE

BARCOL-AIR
AIR DISTRIBUTION

Displacement Diffuser
Perforated

✓ Supply

Applications

Displacement diffusers type DW, DR, DH and DK are designed to supply air (ΔT -2 to -6K compared to room temperature) direct into the working area. The principle of air diffusion makes sure that turbulence is reduced to a minimum. The supplied air spreads over the floor, and flows through the working area upwards to the ceiling by heat sources, such as people or devices, so that the area is completely ventilated.

The diffusers are used in laboratories, factories, terminal buildings, sport halls and big conference rooms.

Technical information

Features:
- Low air outlet velocity.
- Large surface with 32% free area.

Construction:
- Zinc-plated steel sheet, 32% perforated.
- Standard finish diffuser: RAL 9010, stove enamelled.
- Available as circular, semi-circular, quarter-circular and linear diffuser.

Delivery format:
- Diffusers are supplied as a single assembly, dispatched in PVC wrapping.

Mounting:
- The semi-circular, quarter-circular and linear diffusers must be placed on the floor against the wall.
- The circular diffuser can be placed freestanding in the room.
- Duct connection on the top side.

Air pattern

- Circular, semi-circular and quarter-circular diffuser: radial direction (see drawings).
- Linear diffuser: 3-sides (see drawing).

Standard types

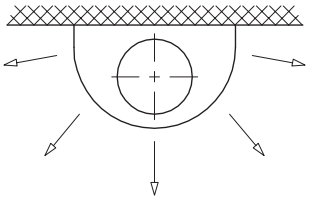
- DWTOOO4: Linear diffuser.
- DRTOOO4: Circular diffuser.
- DHTOOO4: Half-circular diffuser.
- DKTOOO4: Quarter-circular diffuser.

Specify as

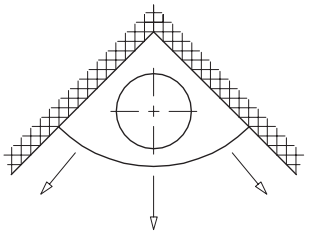
Example:
Linear displacement diffuser for mounting against the wall. The diffuser is delivered with a circular duct connection on the top side.

Finish: RAL 9010.

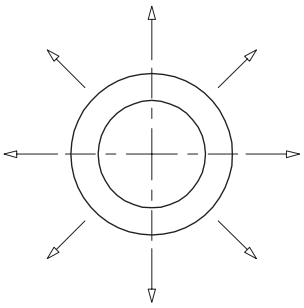
Barcol-Air type: DWTOOO4.



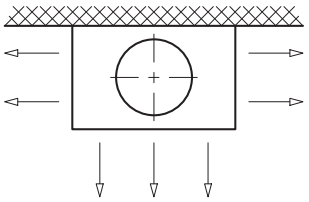
Air pattern type DHTOOO4



Air pattern type DKTOOO4



Air pattern type DRTOOO4



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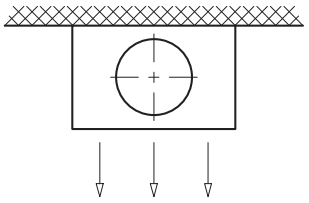

Air pattern type DWTAOO4

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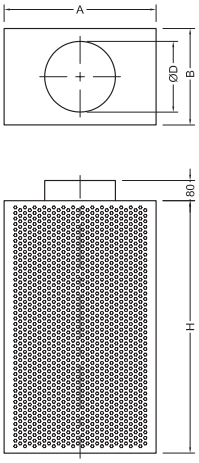
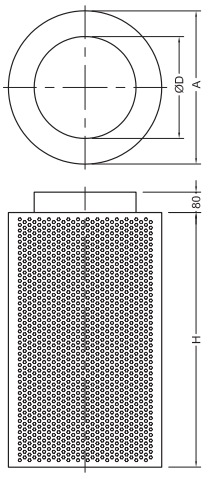
Dimensions





Type DWT / DWTA

Model	400	600	800	1000
A (mm)	402	602	802	1002
B (mm)	332	382	382	402
øD (mm)	224	280	280	315

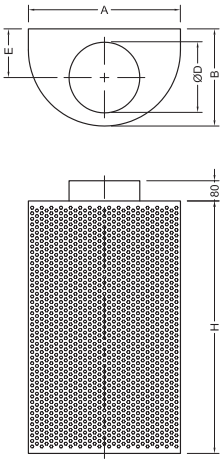
H* (mm)
750
1000
1250
1500

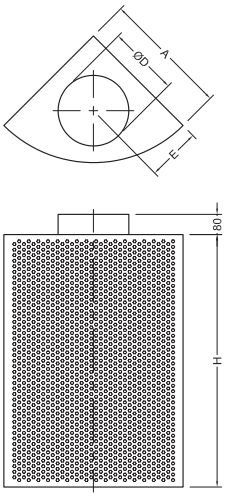
H (mm) - actual height H+3 mm*

Type DRT

Model	400	600	800	1000
A (mm)	402	602	802	1002
øD (mm)	315	400	450	500

H* (mm)
750
1000
1250
1500





Type DHT

Model	600	800	1000	1200
A (mm)	602	802	1002	1202
B (mm)	385	400	500	600
øD (mm)	280	315	355	400
E (mm)	193	202	252	302

H* (mm)
750
1000
1250
1500

H (mm) - actual height H+3 mm*

Type DKT

Model	800	1000	1200	1400
A (mm)	404	502	602	704
øD	224	280	280	315
E (mm)	169	210	251	293

H* (mm)
750
1000
1250
1500

Notes on dimensions:
1. Dimensions in mm

Design characteristics

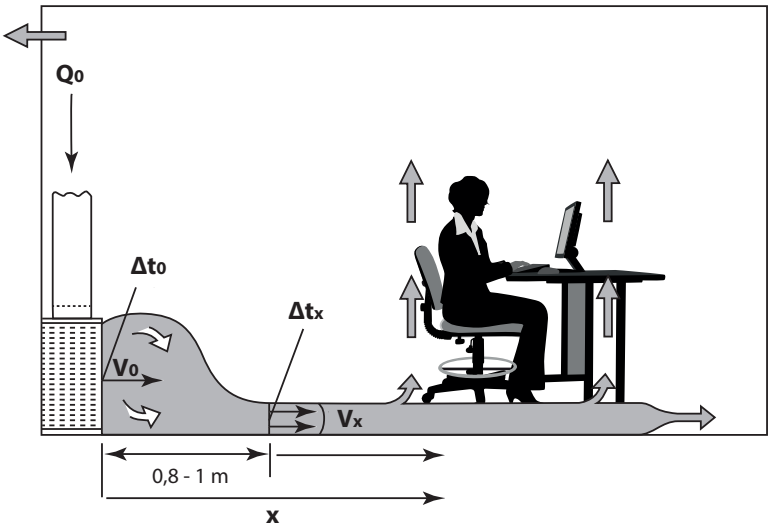
Table 1: Recommended air volume Q_0 (m^3/h) voor DWT, DWTA en DRT

DWTOOO4				
Model	H (mm)	V_0 (m/s)		
		0,15 - 0,18	0,18 - 0,22	0,22 - 0,25
400	750	160 - 200	200 - 240	240 - 380
	1000	220 - 270	270 - 320	320 - 370
	1250	280 - 330	330 - 390	390 - 450
	1500	330 - 380	380 - 470	470 - 540
600	750	240 - 300	300 - 360	360 - 420
	1000	320 - 400	400 - 480	480 - 550
	1250	400 - 490	490 - 600	600 - 680
	1500	490 - 590	590 - 710	710 - 810
800	750	320 - 390	390 - 480	480 - 540
	1000	430 - 530	530 - 640	640 - 720
	1250	540 - 650	650 - 600	600 - 900
	1500	650 - 780	780 - 950	950 - 1080
1000	750	400 - 490	490 - 600	600 - 680
	1000	540 - 650	650 - 800	800 - 900
	1250	670 - 800	800 - 1000	1000 - 1130
	1500	800 - 980	980 - 1190	1190 - 1350

DRT				
Model	H (mm)	V_0 (m/s)		
		0,15 - 0,18	0,18 - 0,22	0,22 - 0,25
400	750	500 - 600	600 - 750	750 - 880
	1000	680 - 850	850 - 1000	1000 - 1150
	1250	850 - 1000	1000 - 1250	1250 - 1450
	1500	1000 - 1220	1220 - 1500	1500 - 1700
600	750	750 - 920	920 - 1110	1110 - 1280
	1000	1000 - 1220	1220 - 1490	1490 - 1700
	1250	1290 - 1520	1520 - 1780	1780 - 2110
	1500	1520 - 1820	1820 - 2250	2250 - 2550
800	750	1000 - 1200	1200 - 1490	1490 - 1700
	1000	1350 - 1630	1630 - 2000	2000 - 2250
	1250	1700 - 2050	2050 - 2500	2500 - 2800
	1500	2050 - 2450	2450 - 3000	3000 - 3900
1000	750	1250 - 1500	1500 - 1750	1750 - 2100
	1000	1700 - 2050	2050 - 2500	2500 - 2800
	1250	2100 - 2550	2550 - 3100	3100 - 3500
	1500	2550 - 3000	3000 - 3700	3700 - 4250

DWTAOO4				
Model	H (mm)	V_0 (m/s)		
		0,15 - 0,18	0,18 - 0,22	0,22 - 0,25
400	750	60 - 80	80 - 90	90 - 140
	1000	80 - 100	100 - 120	120 - 140
	1250	110 - 120	120 - 150	150 - 170
	1500	120 - 140	140 - 180	180 - 200
600	750	110 - 130	130 - 150	150 - 180
	1000	140 - 180	180 - 210	210 - 240
	1250	180 - 220	220 - 260	260 - 300
	1500	220 - 260	260 - 310	310 - 360
800	750	160 - 200	200 - 250	250 - 280
	1000	220 - 270	270 - 330	330 - 370
	1250	280 - 330	330 - 310	310 - 460
	1500	330 - 400	400 - 490	490 - 550
1000	750	220 - 270	270 - 330	330 - 380
	1000	300 - 360	360 - 440	440 - 500
	1250	370 - 440	440 - 550	550 - 630
	1500	440 - 540	540 - 660	660 - 750

Example



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Design characteristics

Table 2: Recommended air volume Q_0 (m^3/h) voor DHT en DKT

DHT				
Model	H (mm)	V_0 (m/s)		
		0,15 - 0,18	0,18 - 0,22	0,22 - 0,25
600	750	370 - 450	450 - 550	550 - 650
	1000	500 - 600	600 - 750	750 - 850
	1250	600 - 750	750 - 930	930 - 1050
	1500	750 - 900	900 - 1130	1130 - 1250
800	750	500 - 600	600 - 750	750 - 850
	1000	680 - 800	800 - 1000	1000 - 1150
	1250	850 - 1000	1000 - 1250	1250 - 1400
	1500	1000 - 1200	1200 - 1500	1500 - 1700
1000	750	650 - 750	750 - 950	950 - 1050
	1000	850 - 1030	1030 - 1250	1250 - 1400
	1250	1050 - 1250	1250 - 1550	1550 - 1750
	1500	1250 - 1500	1500 - 1850	1850 - 2130
1200	750	800 - 950	950 - 1100	1100 - 1250
	1000	1000 - 1200	1200 - 1480	1480 - 1700
	1250	1250 - 1500	1500 - 1850	1850 - 2120
	1500	1500 - 1800	1800 - 2250	2250 - 2550

DKT				
Model	H (mm)	V_0 (m/s)		
		0,15 - 0,18	0,18 - 0,22	0,22 - 0,25
800	750	250 - 300	300 - 380	380 - 430
	1000	350 - 410	410 - 500	500 - 560
	1250	420 - 500	500 - 620	620 - 700
	1500	500 - 600	600 - 740	740 - 840
1000	750	320 - 380	380 - 450	450 - 520
	1000	430 - 500	500 - 630	630 - 700
	1250	520 - 630	630 - 760	760 - 880
	1500	630 - 760	760 - 930	930 - 1050
1200	750	380 - 450	450 - 560	560 - 600
	1000	500 - 600	600 - 750	750 - 840
	1250	640 - 760	760 - 930	930 - 1050
	1500	760 - 820	820 - 1100	1100 - 1280
1400	750	440 - 530	530 - 650	650 - 750
	1000	600 - 700	700 - 850	850 - 980
	1250	730 - 880	880 - 1080	1080 - 1240
	1500	880 - 1050	1050 - 1300	1300 - 1460

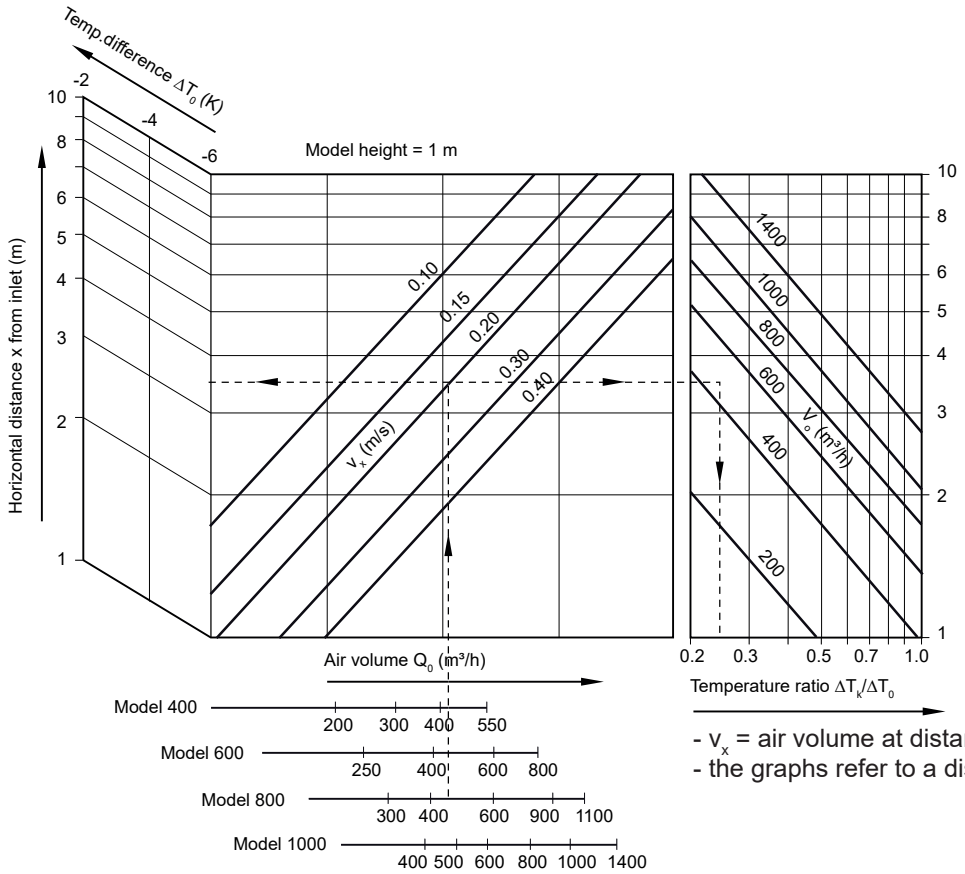
Correction table

Parameter	Model height (mm)			
	750	1000	1250	1500
vx (1)	x 0,94	x 1,00	x 1,04	x 1,07
$\Delta t_x / \Delta t_0$ (1)	x 0,86	x 1,00	x 1,11	x 1,22
Δp_t (1)	1,25	x 1,00	x 0,80	x 0,65
L_{WA} (dB)	+ 3	+ 0	- 3	- 6

Definitions:

L_{WA}	(dB)	- sound power level
Δp_t	(Pa)	- pressure loss
Δt_0	(K)	- temperature difference between room air and supply air
Δt_x	(K)	- temperature difference between room air and supply air at distance x from inlet
v_0	(m/s)	- air velocity at the inlet
v_x	(m/s)	- air velocity 0.25 m above the floor, at distance x from the inlet
q_0	(m^3/h)	- supply air volume
x	(m)	- distance form the inlet

Selection data type DWT

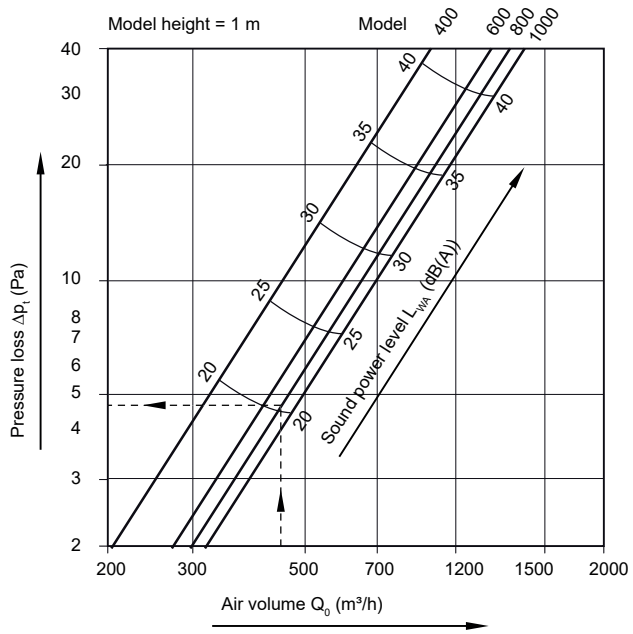


- v_x = air volume at distance x from the inlet
- the graphs refer to a distance of 0.25 m above the floor

Correction factor for type DWTAOO4:

Model	Correction factor Air volume
400	0,38
600	0,44
800	0,51
1000	0,55

Pressure loss and sound parameters type DWT



Note: for other models see correction table.

Selection example:

Layout:

Type:	DWT
Model height:	750 mm
Air volume:	450 m³/h
Temperature difference:	-6 K
Maximum air velocity on the floor:	0.2 m/s

Target value:

1. Model
2. x, Δt_x / Δt_0
3. Δp_t, L_{WA}

Solution:

1. Using table 1 (recommended air volume):
   Model = 800

2. Using selection graph:
   x = 3.4 m (when v_x x 0.94)
   Δt_x / Δt_0 = 0,25 x 0,86 = 0.22

3. Using pressure loss and sound parameters:
   Δp_t = 5 x 1.25 = 6 Pa
   L_{WA} = 21 + 3 = 24 dB

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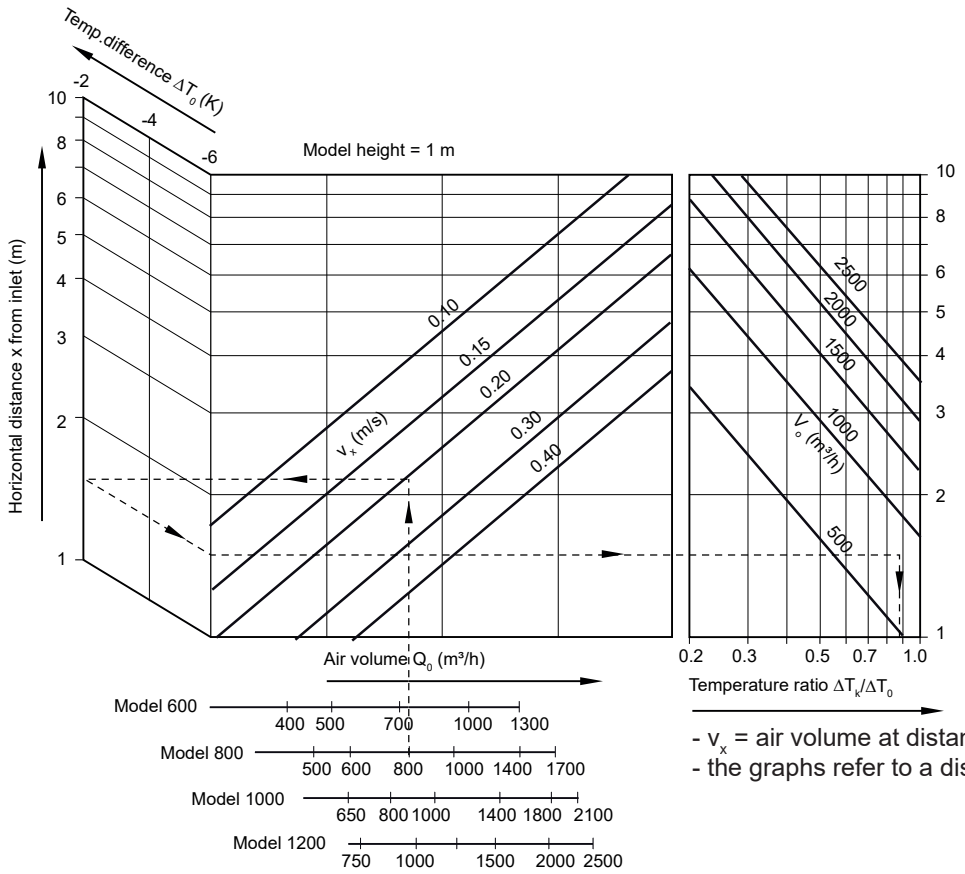
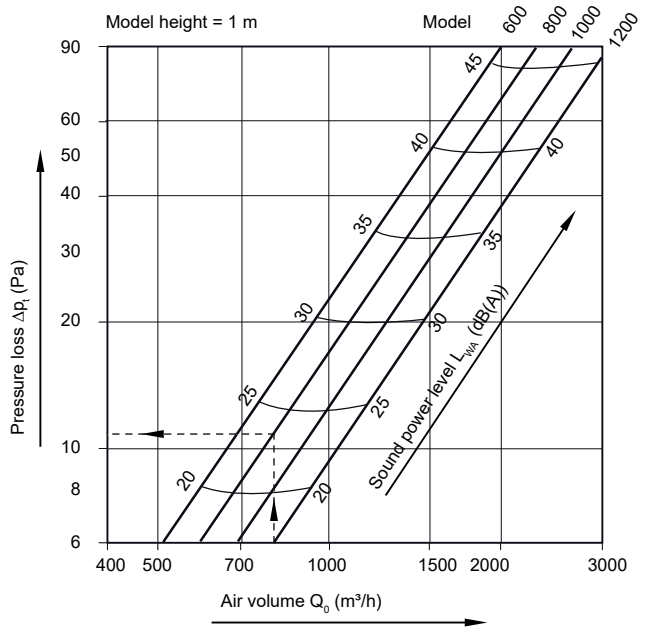
Selection data type DHT



- v_x = air volume at distance x from the inlet
- the graphs refer to a distance of 0.25 m above the floor

Pressure loss and sound parameters type DHT



Note: for other models see correction table.

Selection example:

Layout:

Type:	DHT
Model height:	1000 mm
Air volume:	800 m³/h
Temperature difference:	-2 K
Maximum air velocity on the floor:	0.2 m/s

Target value:

1. Model
2. x, Δt_x / Δt_0
3. Δp_t, L_{WA}

Solution:

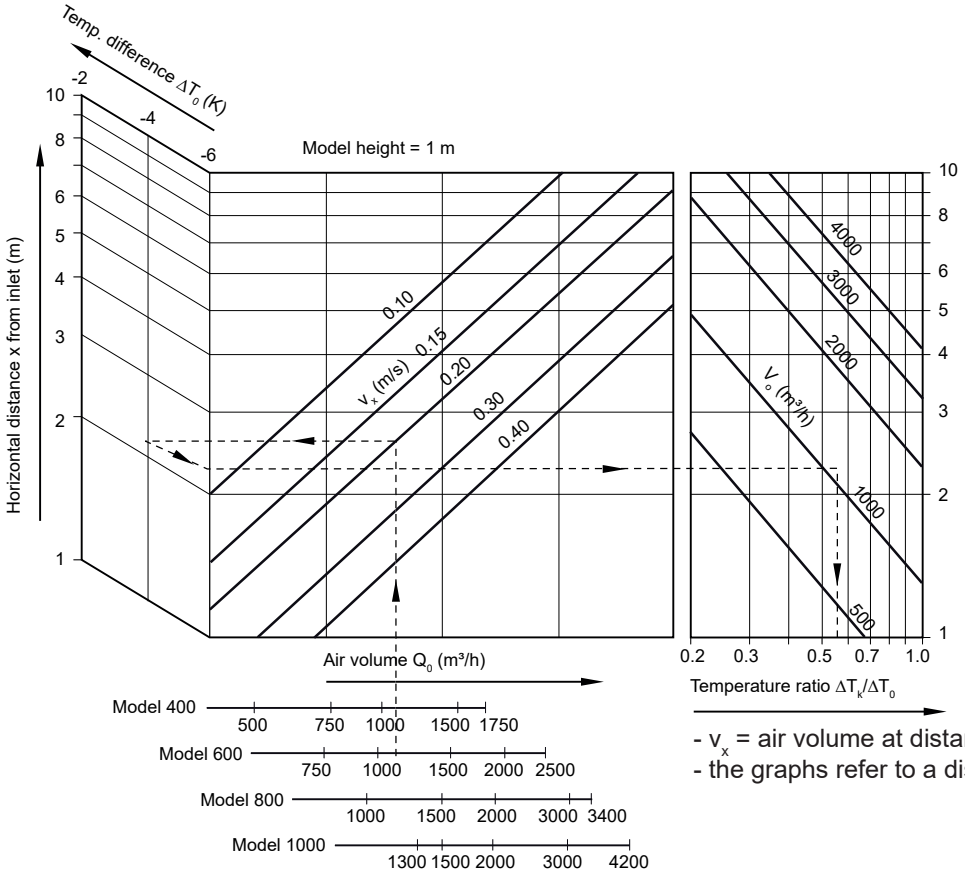
1. Using table 2 (recommended air volume):
   Model = 800

2. Using selection graph:
   v_x = 0.21 x 1 = 0.21 m/s
   Δt_x / Δt_0 = 0.89 x 1 = 0.89

3. Using pressure loss and sound parameters:
   Δp_t = 11 x 1 = 11 Pa
   L_{WA} = 24 + 0 = 24 dB

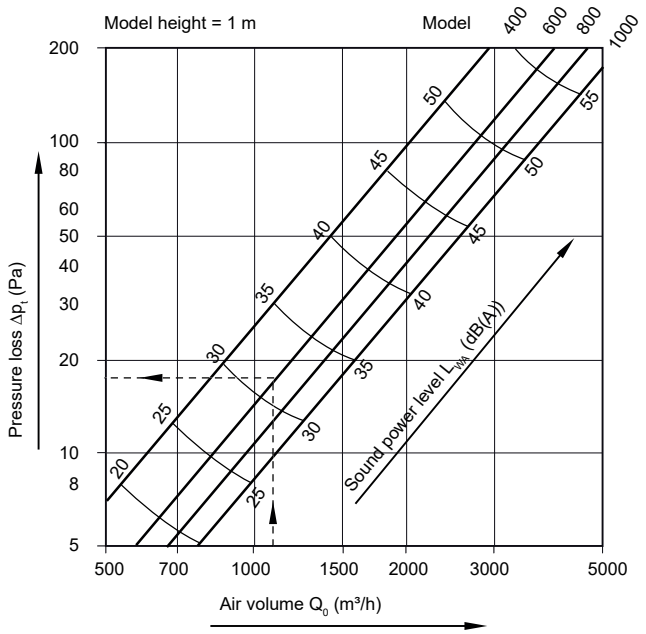
✓ Supply

Selection data type DRT



- v_x = air volume at distance x from the inlet
- the graphs refer to a distance of 0.25 m above the floor

Pressure loss and sound parameters type DRT



Note: for other models see correction table.

Selection example:

Layout:

Type:	DRT
Model height:	600 mm
Air volume:	1100 m³/h
Temperature difference:	-4 K
Maximum air velocity on the floor:	0.2 m/s

Target value:

1. Model height H
2. x, Δt_x / Δt_0
3. Δp_t, L_{WA}

Solution:

1. Using table 1 (recommended air volume):
   Model height = 1000
2. Using selection graph:
   v_x = 2.3 (when v_x x 1)
   Δt_x / Δt_0 = 0.56 x 1 = 0.56
3. Using pressure loss and sound parameters:
   Δp_t = 17 x 1 = 17 Pa
   L_{WA} = 31 + 0 = 31 dB

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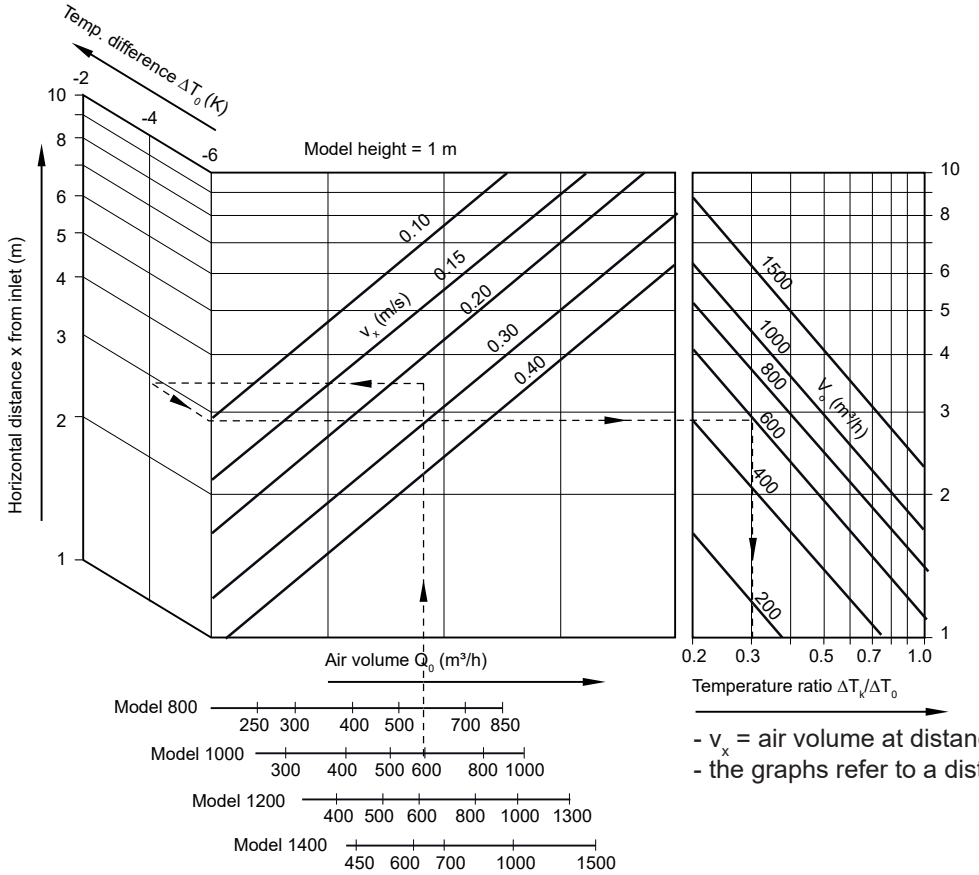
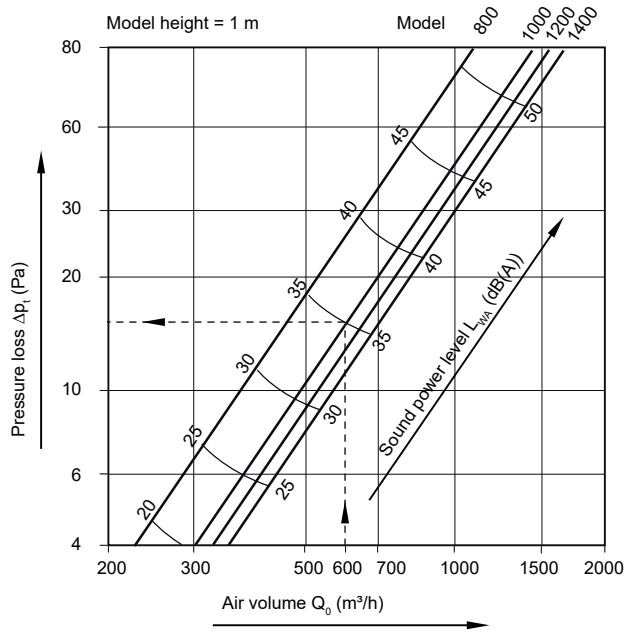
Selection data type DKT



- v_x = air volume at distance x from the inlet
- the graphs refer to a distance of 0.25 m above the floor

Pressure loss and sound parameters type DKT



Note: for other models see correction table.

Selection example:

Layout:

Type:	DKT
Model height:	1000 mm
Air volume:	600 m³/h
Temperature difference:	-4 K
Maximum air velocity on the floor:	0.3 m/s

Target value:

1. Model height H
2. v_x,x
3. Δp_t, L_{WA}

Solution:

1. Using table 2 (recommended air volume):
   Model height = 1250 mm
2. Using selection graph:
   v_x = 0.23 m x 1.04 = 0,24 m/s
   x = 2.90
3. Using pressure loss and sound parameters:
   Δp_t = 15 x 0.8 = 12 Pa
   L_{WA} = 35 - 3 = 32 dB

BARCOL-AIR
AIR DISTRIBUTION

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