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Oval swirl diffuser DFRA-OV



Model DFRA-OV 16



Model DFRA-OV 24



Model DFRA-OV 34

Description

The adjustable-blade swirl diffusers supplied by Mech-Elec are made entirely of steel sheet. The diffuser basically consist of the following:

- Front diffuser integrated in a panel of 1200x300 that can be adapted to modular ceiling format, plaster ceiling, etc. The standard diffuser finish is white (Ra19010) with adjustable blades in black (Ra19005). Other finishes can be supplied by special order upon prior consultation with our Sales Department

- Connection plenum in galvanized steel sheet with internal equalizer panel to ensure proper air distribution and air inlet of standard ISO diameter with manual damper. The standard model of this damper is accessible from the false ceiling, although a special installation type also allows the user to make adjustments from the room using a hidden screw.

The front diffuser is attached to the plenum by screws. An electrical servo drive for applications in VAV systems can also be added.

Applications

All these units can be used in VAV systems, allowing the flow rate to be reduce up to 25% of the nominal air flow rate without producing uncomfortable air currents in the facility.

The recommended mounting height is around 2,5 to 4 meters for all models.

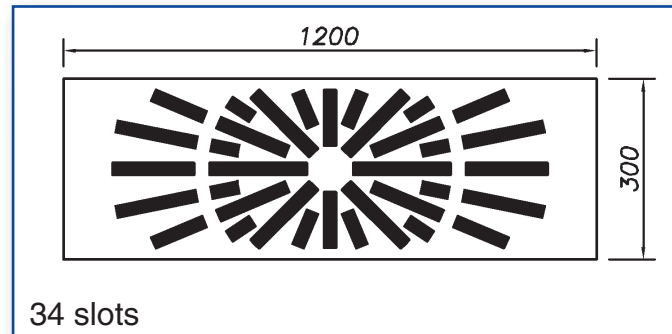
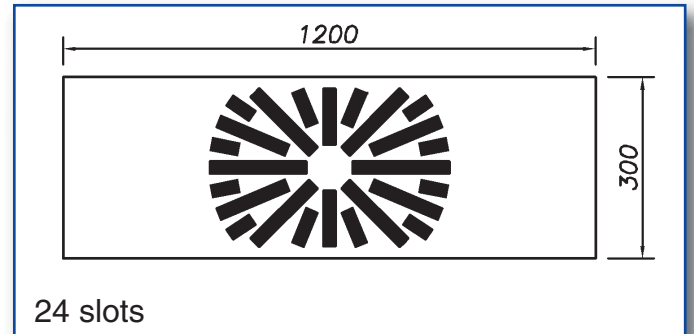
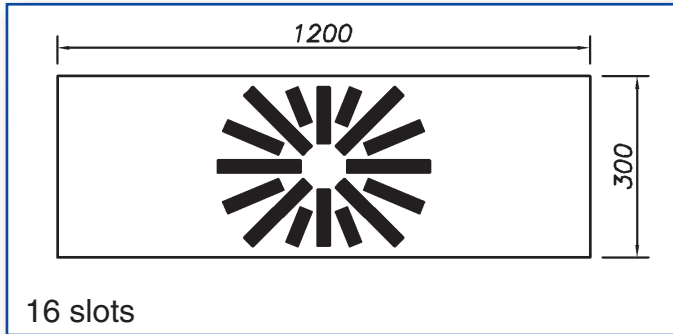
Increasingly stringent requirements from the standpoint of technical features (higher supply flow rates and lower velocities in the occupant area) and aesthetics (smoother incorporation in the interior design) have generally made swirl diffusers a better choice for air diffusion.

The table below provides a quick selection, on the basis of a required sound level of the air flow (m^3/h) and the pressure drop (Pa) of the diffuser:

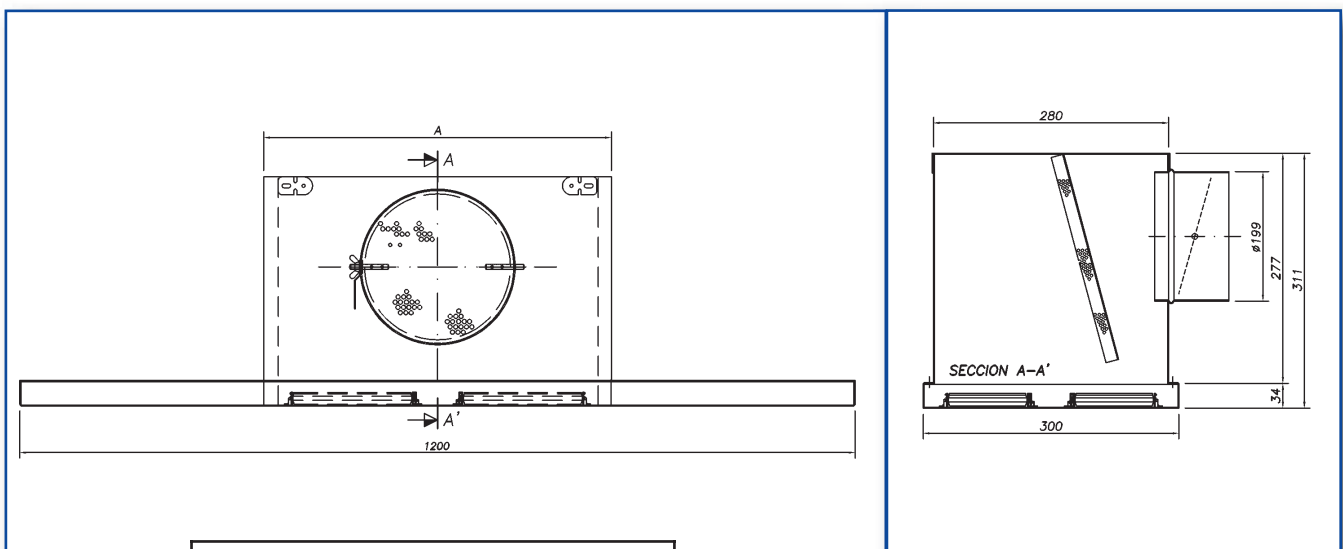
SOUND POWER - AIR FLOW - ΔP_t					
Model	m^3/h (Pa)				
	25 dB(A)	30 dB(A)	35 dB(A)	40 dB(A)	45 dB(A)
DFRA-OV 16	200 (9)	238 (12)	282 (17)	335 (24)	398 (34)
DFRA-OV 24	231 (8)	273 (12)	322 (16)	380 (22)	449 (31)
DFRA-OV 34	270 (9)	319 (12)	377 (17)	445 (24)	526 (33)

Models and dimensions

There are three basic slot arrays for the DFRA-OV model, varying from 16, 24 and 34 slots and covering a wide range of air flow rates. The three different arrangements are integrated into plates of 1200x300.



Fixed side entre plenum box for diffusers integrated into a rectangular plates for modular ceilings, type PF



Plaque for modular ceiling: DFRA-OV		
Model	Dimensions	A
DFRA-OV 16	1200x300	450
DFRA-OV 24	1200x300	450
DFRA-OV 34	1200x300	780

Technical data. Selection table

Q		DFRA-OV			
(m ³ /h)	(l/s)	Model	16	24	34
150	41,7	X (m)	1,0		
		ΔPt (Pa)	5		
		L_{WA} - dB(A)	<20		
200	55,6	X (m)	1,3	1,8	1,5
		ΔPt (Pa)	9	6	5
		L_{WA} - dB(A)	25	21	<20
250	69,4	X (m)	1,7	2,3	1,9
		ΔPt (Pa)	13	10	7
		L_{WA} - dB(A)	31	27	23
300	83,3	X (m)	2,0	2,8	2,3
		ΔPt (Pa)	19	14	11
		L_{WA} - dB(A)	37	33	28
350	97,2	X (m)	2,3	3,2	2,7
		ΔPt (Pa)	26	19	15
		L_{WA} - dB(A)	41	37	33
400	111,1	X (m)	2,7	3,7	3,1
		ΔPt (Pa)	34	25	19
		L_{WA} - dB(A)	45	42	37
450	125,0	X (m)		4,1	3,4
		ΔPt (Pa)		31	24
		L_{WA} - dB(A)		45	40
500	138,9	X (m)			3,8
		ΔPt (Pa)			30
		L_{WA} - dB(A)			44
550	152,8	X (m)			4,2
		ΔPt (Pa)			36
		L_{WA} - dB(A)			46

General remarks

- this selection table is based on real laboratory tests performed in accordance with ISO 5135 and UNE-EN-ISO 3741 standards.
- The air jet has coanda effect, or in other words, the diffuser is mounted at ceiling level.
- The room height is 3 meters.
- The ΔT is equal to 0°C. (difference between inlet temperature and ambient temperature).
- The throws correspond to a maximum air velocity in the occupied zone (V_z) of 0,25 m/s.

SYMBOLS USED

ΔP_t Pressure drop, in Pa

L_{WA} -dB(A) Sound power, in dB(A)

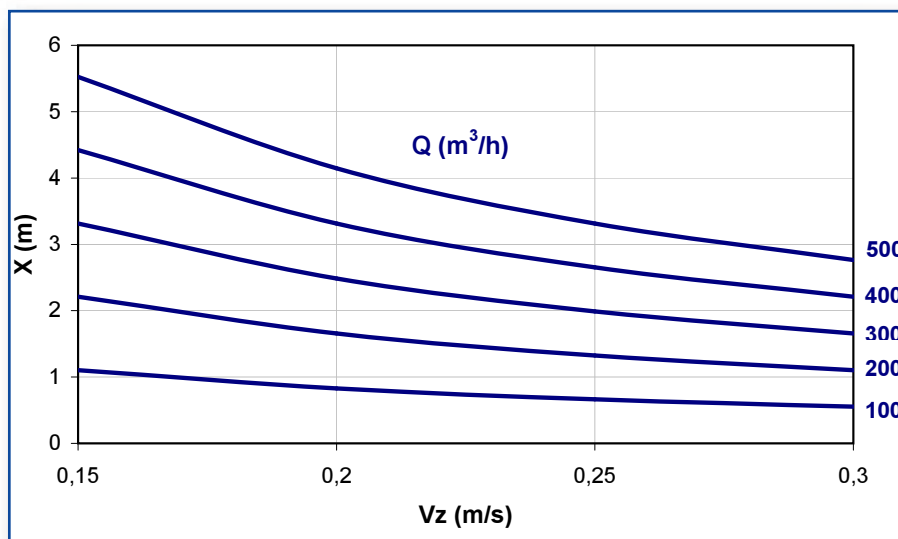
X Air jet throw for a velocity in the occupied zone of 0,25 m/s, in m.

Technical data. Selection graphs

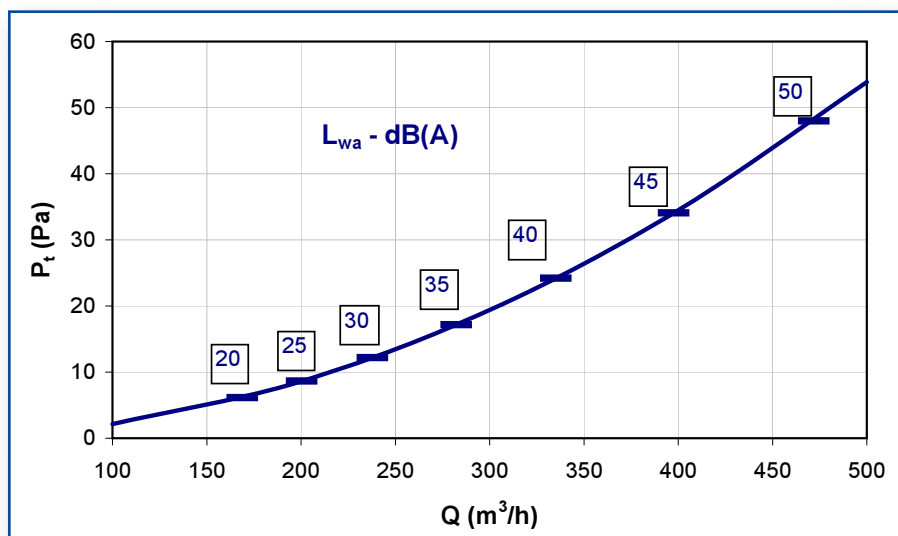
Model DFRA-OV 16



VELOCITY & THROW



SOUND POWER & PRESSURE DROP



SYMBOLS

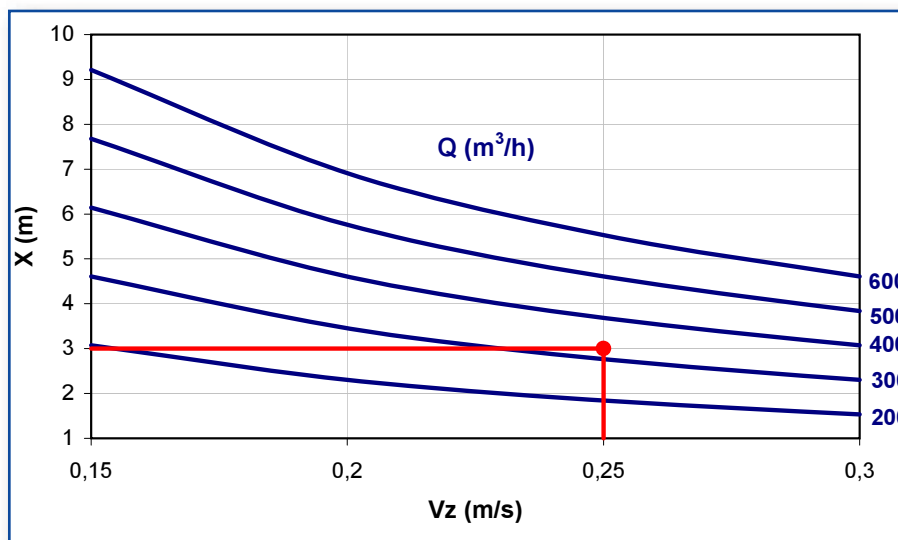
- V_z Maximum air velocity in the occupied area.
- X Throw in m. for an air velocity of 0,25 m/s in the occupied zone.
- ΔP_t Total pressure drop
- L_{WA} -dB(A) Sound power, in dB(A)

Technical data. Selection graphs

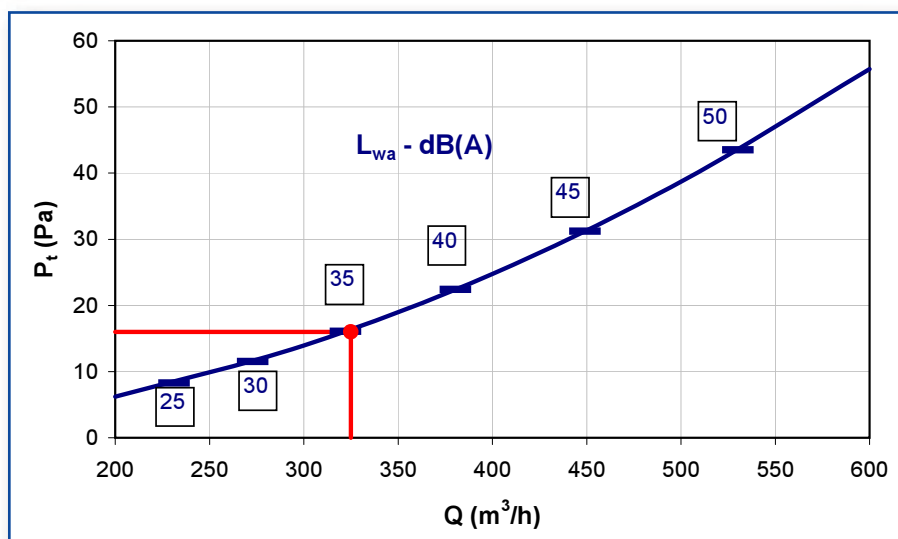
Model DFRA-OV 24



VELOCITY & THROW



SOUND POWER & PRESSURE DROP



SYMBOLS

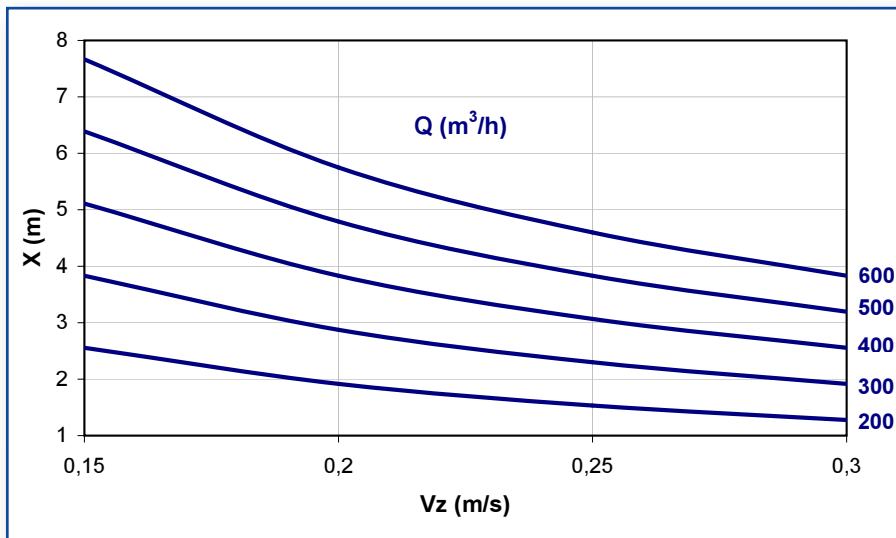
- V_z Maximum air velocity in the occupied area.
- X Throw in m. for an air velocity of 0,25 m/s in the occupied zone.
- ΔP_t Total pressure drop
- L_{wA} -dB(A) Sound power, in dB(A)

Technical data. Selection graphs

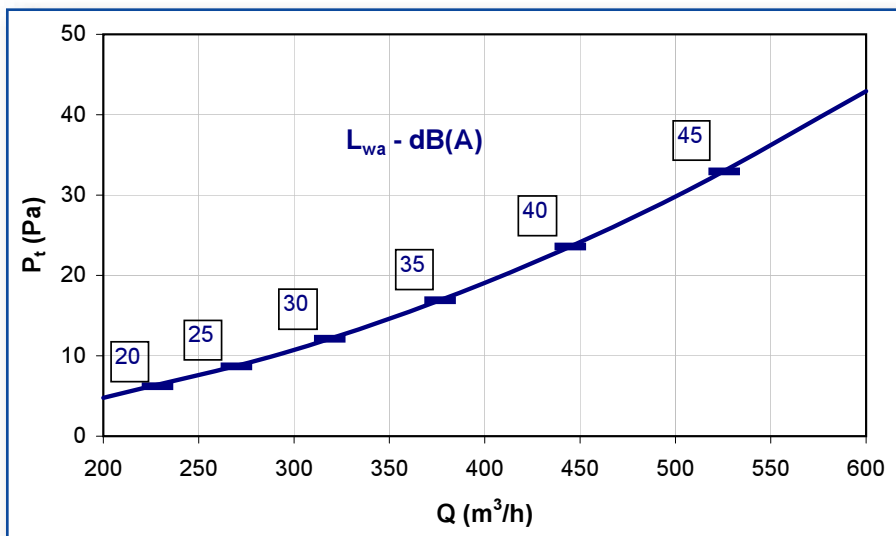
Model DFRA-OV 34



VELOCITY & THROW



SOUND POWER & PRESSURE DROP



SYMBOLS

- V_z Maximum air velocity in the occupied area.
- X Throw in m. for an air velocity of 0,25 m/s in the occupied zone.
- ΔP_t Total pressure drop
- L_{WA} -dB(A) Sound power, in dB(A)

Example of selection

The selection graphs contained in this catalogue for the different models allow you to use the supply air flow and a maximum velocity in the occupied area (V_z) to calculate the following parameters:

- Throw achieved by the air vein for a maximum air velocity in the occupied zone (V_z).
- Total pressure drop and sound power level generated in the plenum-diffuser assembly.

The methodology is explained below with an example:

Initial data

Diffuser model: **DFRA-OV 24**

Air flow: **325 m³/h**

Maximum air velocity in the occupied area: **0,25 m/s**

Results

Bases on the graphs of page 5, we have:

Throw for a maximum air velocity into the occupied area of 0,25 m/s: **3 m**

Total pressure drop: **16 Pa**

Sound power: **35 dB(A)**

Coding. Example

Coding provides a unique description of the model ordered by the customer.

DFRA-OV	Oval radial swirl diffuser 1200x300
16 - 24 - 34	Number of slots in the diffuser
PF	Fixed plenum box without insulation
PFA	Insulated fixed plenum box
RAL 9010	Standard finish in white
RAL...	Finish in some other RAL

Coding example:

DFRA-OV 24 PF RAL 9010

Oval radial swirl diffuser, 24 slots, uninsulated fixed plenum box, painted in white.