

Lievore,  
Altherr  
& Molina

Patented

## OTO curved vents swirl diffusers

### MADEL®

Swirl diffusers of **OTO** series are designed to be used in air conditioning, ventilation and heating systems at a temperature differential up to 12° C. They can be mounted in false ceilings or suspended from the ceiling, from 2,6 up to 4 metres high. **OTO** diffusers are designed for both CAV and VAV installations.

The radial configuration of its eight sections produces a rotational induction of air with coanda effect and the high airflow rate reduces stratification. The particular design of the vents creates a uniform airflow along the length of each aperture.

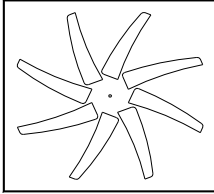
As a result of the collaboration with Lievore, Altherr & Molina, the original design of **OTO** diffusers allows manufacture from a continuous sheet, without any edges which highlight an assembled construction. This results in very smooth airflow characteristics, optimising its design function and reducing the visual impact within the architectural surroundings.

#### Models:

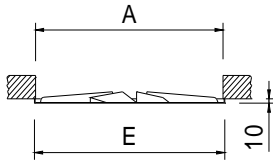
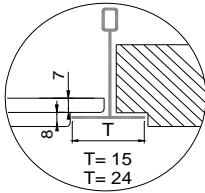
**OTO-S**

**OTO-C**

**OTO-S**



**OTO-S.../T.../**



	E	A
600	595	569
610	605	579
625	620	594

**OTO-S**

**CLASSIFICATION**

**OTO-S** Square diffusers for modular ceiling.

**.../T15/** Panel with angled borders to replace an angled ceiling tile profile 15 mm.

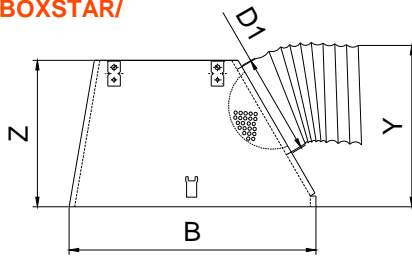
**.../T24/** Panel with angled borders to replace an angled ceiling tile profile 24 mm.

**MATERIAL**

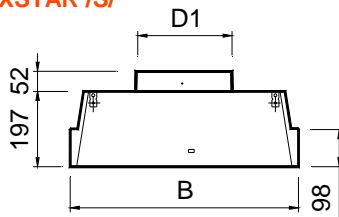
Diffuser constructed from galvanised steel.

All diffusers are provided with a seal on the back of the frame in order that the perimeter in contact with the plenum box or the ceiling is airtight.

**BOXSTAR/**



**BOXSTAR /S/**



	B	Z	Y	D1
300	290	250	275	123
310	303	250	275	123
400	390	300	325	198
500	490	300	325	198
600-D1:250	590	350	375	248
600-D1:200	590	300	325	198
610-D1:250	600	350	375	248
610-D1:200	600	300	325	198
625-D1:250	615	350	375	248
625-D1:200	615	300	325	198

**ACCESSORIES**

**BOXSTAR** Pyramidal plenum box with a lateral circular connection. It includes supports to hang from the ceiling. The crossbar is supplied separately to be assembled manually on the work site. Made in galvanised steel.

**...-R** Plenum box with a flow damper in the spigot.

**.../S/** Upper circular connection plenum box .

**.../AIS/** Thermally insulated plenum box with foam. Density 30 kg / m<sup>3</sup> ISO 845.

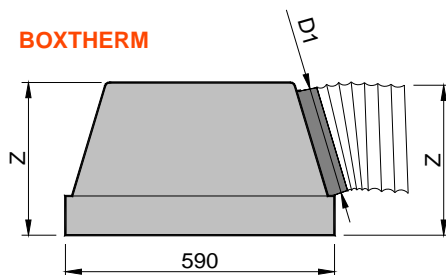
Thermal conductivity 20° C\_0,040 W / m°K ISO 3386/1. Classified reaction to fire B-s2, d0 EN 13501-1.

**BOXTHERM** Plenum box thermo acoustically insulated with a lateral circular connection.

**...-R** Plenum box with a flow damper in the spigot.

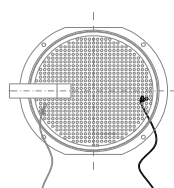
**COR** Set of 2 cords to regulate the plenum damper type-R from the face of the diffuser.

**BOXTHERM**



	Z	D1
BOXTHERM 600-DIAM250	350	248
BOXTHERM 600-DIAM200	300	198

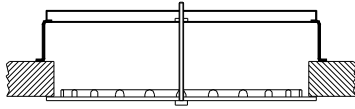
**COR**



Blanca abrir  
White open

Negra cerrar  
Black close

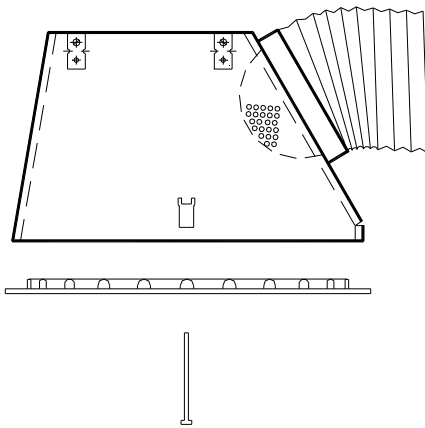
1)



#### FIXING SYSTEMS

1) Connection to the plenum box by means of central screw.

1)



#### FINISHES

**M9016** Painted white similar to RAL 9016 (85-95% gloss)

**R9016S** Painted white RAL 9016 semi-matt (60-70% gloss)

**R9010S** Painted white RAL 9010 semi-matt (60-70% gloss)

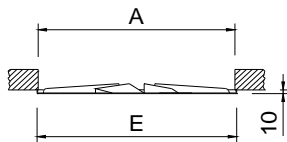
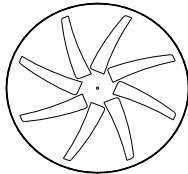
**RAL...** Painted in other RAL colours

#### SPECIFICATION TEXT

Supply and mounting of square swirl diffuser with curved vents in radial configuration series

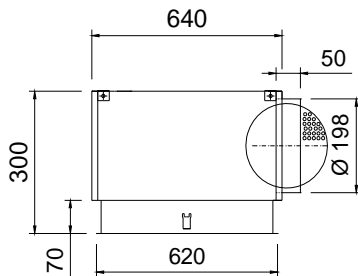
**OTO-S+BOXSTAR M9016 dim. 600** constructed from galvanised steel paint in white **M9016**. With lateral circular connection pyramidal plenum box **BOXSTAR**. Manufacturer **MADEL**.

### OTO-C

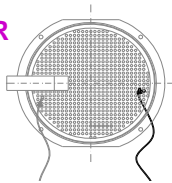


	E	A
625	620	601

### PLXOC



### COR



Blanca abrir  
White open

Negra cerrar  
Black close

### OTO-C

#### CLASSIFICATION

**OTO-C** Circular diffuser for continuous ceiling.

#### MATERIAL

Diffuser constructed from galvanised steel. All diffusers are provided with a seal on the back of the frame in order that the perimeter in contact with the plenum box or ceiling is airtight.

#### ACCESSORIES

**PLXOC** Plenum box with a lateral circular connection. Made in galvanised steel.

**...-R** Plenum box with a flow damper in the spigot.

**.../S/** Plenum box with an upper connection.

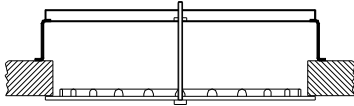
**.../AIS/** Thermally insulated plenum box with foam. Density 30 kg / m<sup>3</sup> ISO 845. Thermal conductivity 20° C\_0,040 W / m°K ISO 3386/1.

Classified reaction to fire B-s2, d0 EN 13501-1.

**PMXO** Crossbar suitable for mounting in false ceiling with rectangular duct.

**COR** Set of 2 cords to regulate the plenum damper type-R from the face of the diffuser.

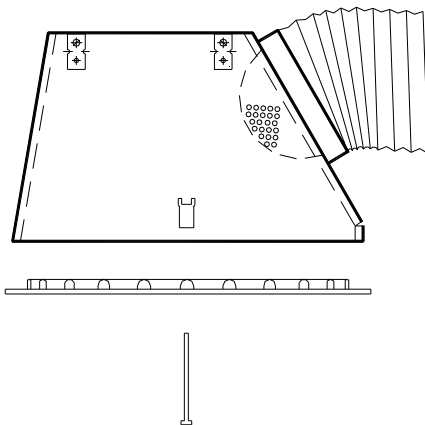
1)



#### FIXING SYSTEMS

- 1) Connection into the crossbar or to the plenum box by means of central screw.

1)



#### FINISHES

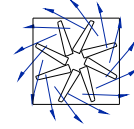
- M9016** Painted white similar to RAL 9016 (85-95% gloss)  
**R9016S** Painted white RAL 9016 semi-matt (60-70% gloss)  
**R9010S** Painted white RAL 9010 semi-matt (60-70% gloss)  
**RAL...** Painted in other RAL colours

#### SPECIFICATION TEXT

Supply and mounting of circular swirl diffuser with curved vents in radial configuration series **OTO-C+PLXOC M9016 dim. 625** constructed from galvanised steel paint in white **M9016**. With lateral circular connection plenum box **PLXOC**.  
 Manufacturer **MADEL**.

### OTO-S

(Technical data equal to 600, 610 or 625)



RECOMMENDED VELOCITY.

OTO	Vmin m/s	Vmax m/s
600	2.5	4
625	2.5	4

FREE FACE AREA (m2).

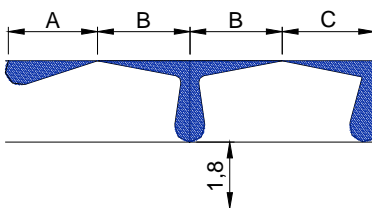
OTO	Afree m2	Qmin. m3/h	Qmax. m3/h
600	.0397	357	580
625	.0397	357	580

CORRECTION FACTOR FOR DPt and LWA1.

BOXSTAR-R		100% Open	50% Open	10% Open
		600	Dpt (Kp) 1	1.2
	Lwa1 (Kf)	+0,7	+3,5	-2,6
625	Dpt (Kp)	1	1.2	3.1
	Lwa1 (Kf)	+0,8	+2,7	-0,6

$$DPt1 = Kp \times DPt$$

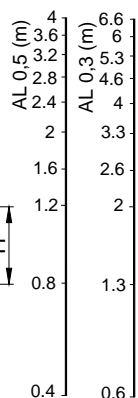
$$Lwa = Lwa1 + Kf$$



$$AL_{0.2} = A$$

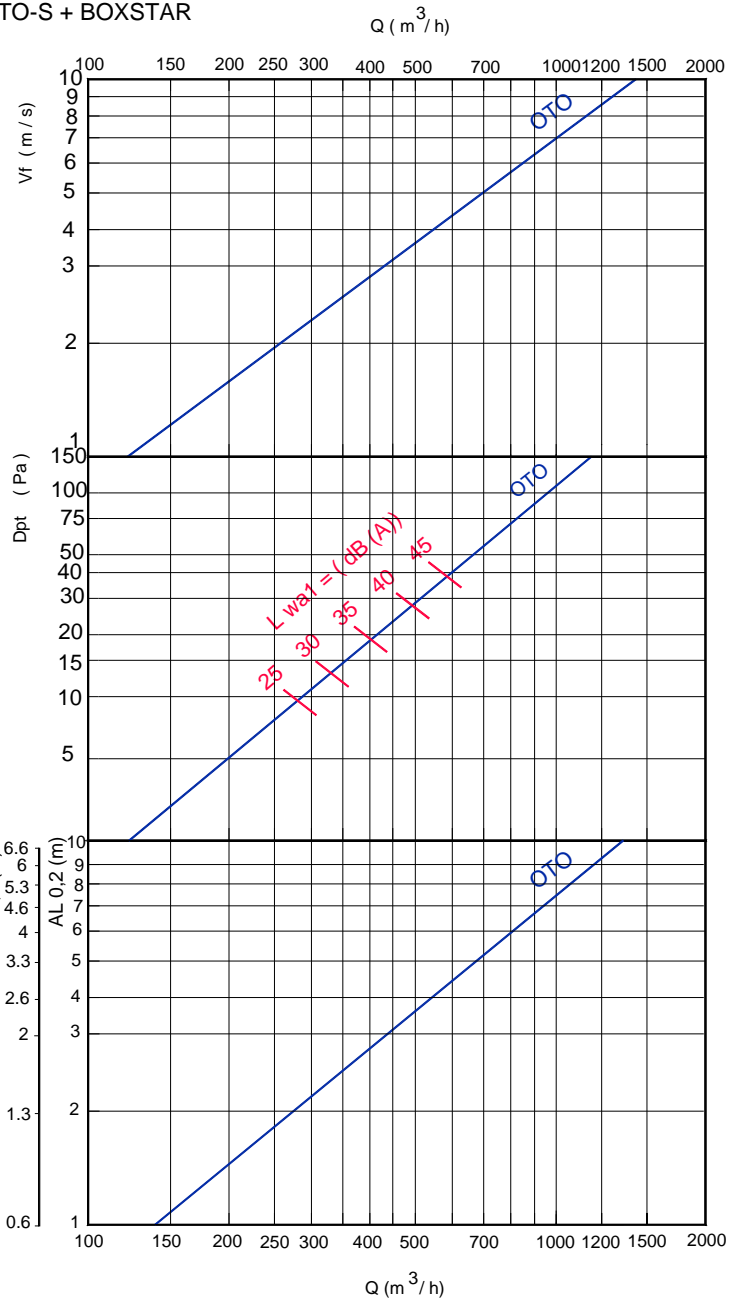
$$AL_{0.2} = B+H$$

$$AL_{0.2} = C+H$$



FREE VELOCITY, PRESSURE LOSS, SOUND POWER LEVEL AND THROW WITH CEILING EFFECT.

OTO-S + BOXSTAR

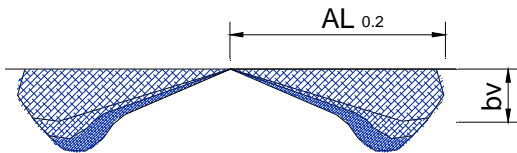
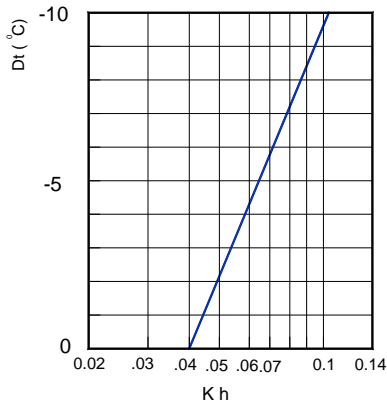


Note: In MadelMedia Octava band centre frequency in Hz.

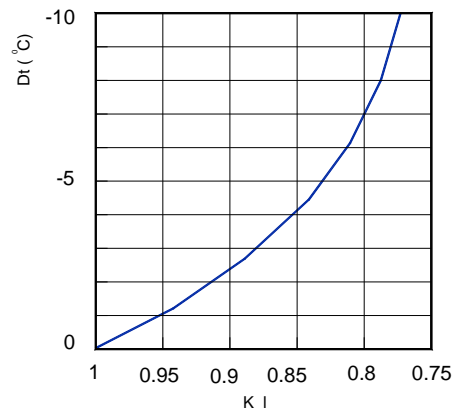
**OTO-S**

(Technical data equal to 600, 610 or 625)

CORRECTION FACTOR FOR VERTICAL DIFFUSION (bv) FOR DT (-).  
Kh = Correction factor for vertical diffusion.



CORRECTION FACTOR FOR THROW (L 0,2) DT (-).  
Kl = Correction factor for throw.

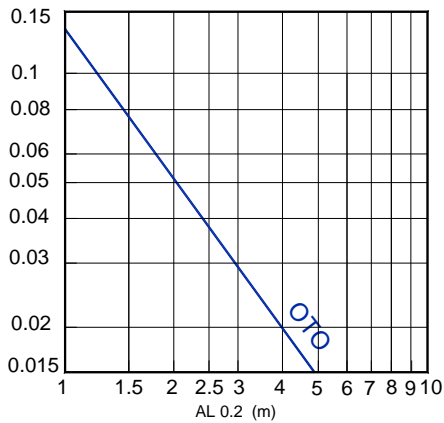


$$bv = Kh \times AL_{0.2}$$

$$AL'_{0.2} (Dt < 0) = Kl \times AL_{0.2}$$

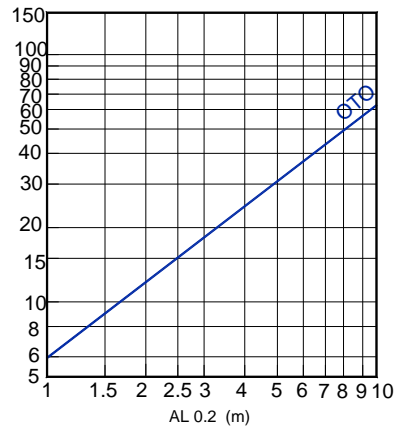
TEMPERATURE RATIO.

$$\frac{Dt_l}{Dt_z} = \frac{t_{room} - t_x}{t_{room} - t_{supply}}$$



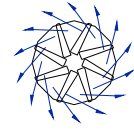
INDUCTION RATIO.

$$i = \frac{Q_r}{Q_0} = \frac{Q_{total\ at\ x}}{Q_{of\ supply}}$$





**OTO-C**



RECOMMENDED VELOCITY:

OTO	Vmin m/s	Vmax m/s
625	2.5	4

FREE FACE AREA (m2).

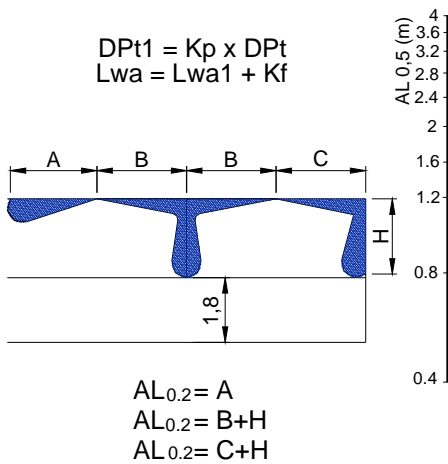
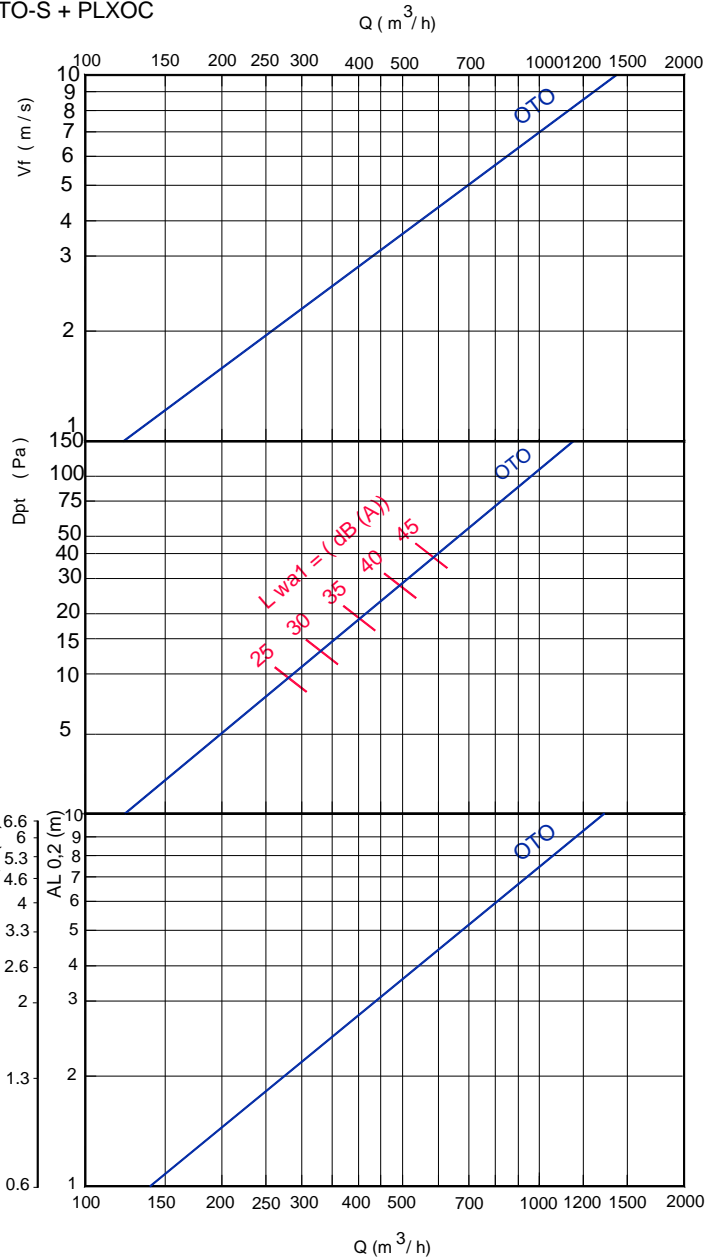
OTO	Afree m2	Qmin. m3/h	Qmax. m3/h
625	.0397	357	580

CORRECTION FACTOR FOR Dpt and Lwa1.

PLXOC-R		100% Open	50% Open	10% Open
		Dpt (Kp)	1	1.2
625	Lwa1 (Kf)	+0,8	+2,7	-0,6

FREE VELOCITY, PRESSURE LOSS, SOUND POWER LEVEL AND THROW WITH CEILING EFFECT.

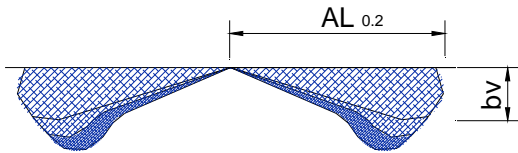
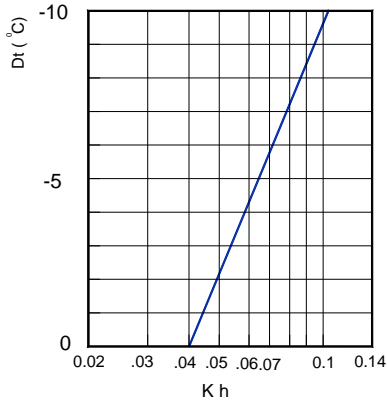
**OTO-S + PLXOC**



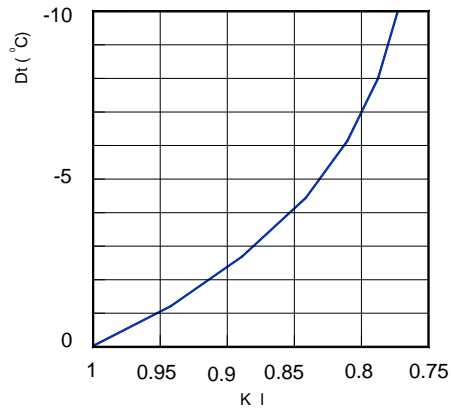
Note: In MadelMedia Octava band centre frequency in Hz.

OTO-C

CORRECTION FACTOR FOR VERTICAL DIFFUSION (bv) FOR DT (-).  
 Kh = Correction factor for vertical diffusion.



CORRECTION FACTOR FOR THROW (L 0,2) DT (-).  
 Kl = Correction factor for throw.

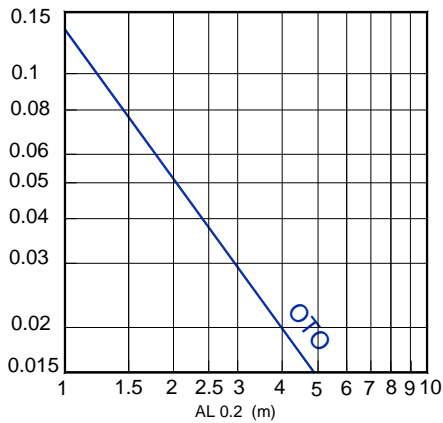


$$bv = Kh \times AL_{0,2}$$

$$AL'_{0,2} (Dt < 0) = Kl \times AL_{0,2}$$

TEMPERATURE RATIO.

$$\frac{Dtl}{Dtz} = \frac{t_{room} - t_x}{t_{room} - t_{supply}}$$



INDUCTION RATIO.

$$i = \frac{Q_r}{Q_0} = \frac{Q_{total\ at\ x}}{Q\ of\ supply.}$$

