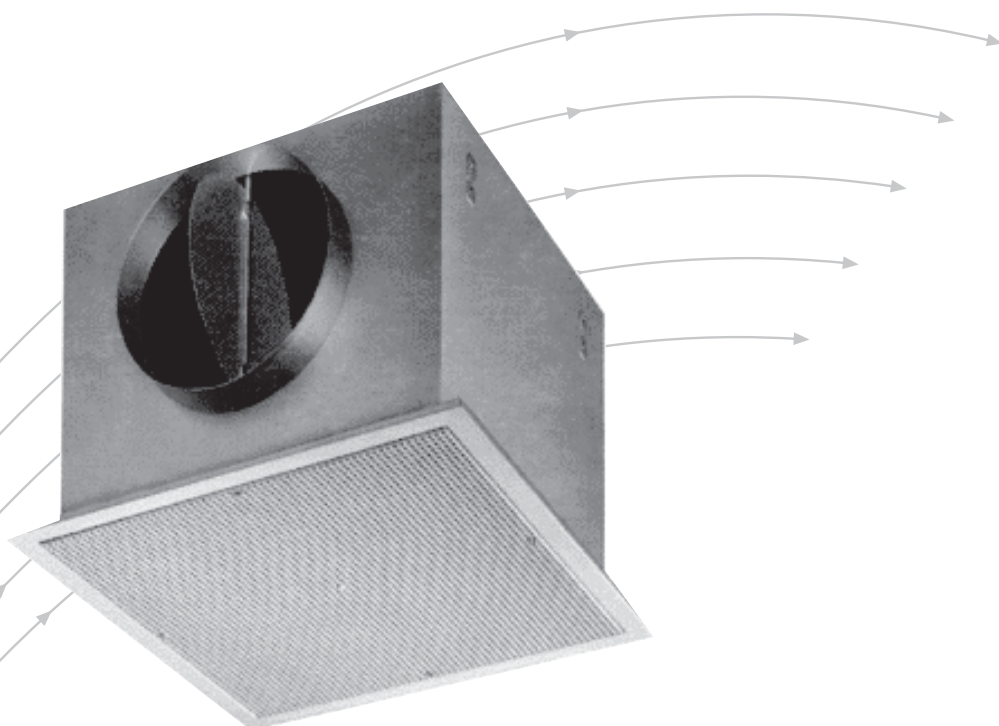


Ceiling Diffusers

- Type ADLQL
- recommended for room height from 2.60m to 4.00m



TROX[®] TECHNIK

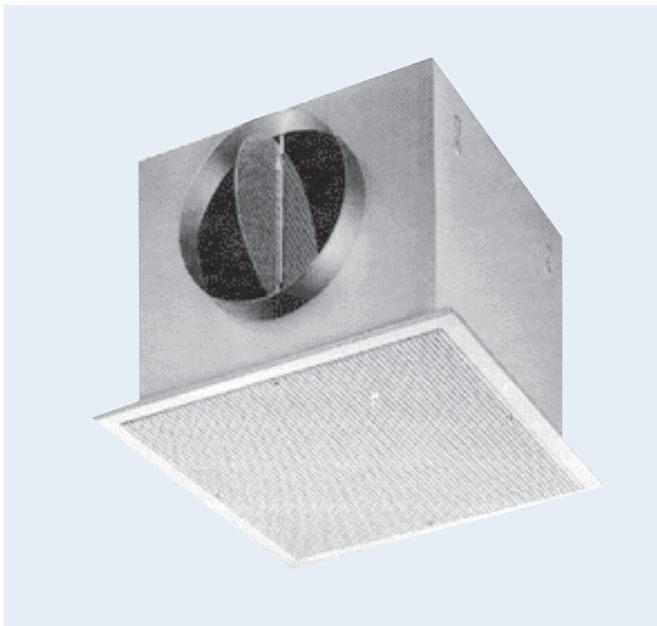
• TROX Malaysia Sdn. Bhd.
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Contents · Description

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ADLQL-....-H Construction



ADLQL-....-V Construction



Type ADLQL ceiling diffusers are ideal for flush installation in tiled ceilings. They are recommended for room heights of between 2.60 m to 4.00 m.

They are characterized by high induction, which results in rapid decay of supply air velocity and temperature differential. The recommended supply air temperature differential range is +10K.

This diffuser is suitable for either supply or exhaust application. For supply air, it will discharge air horizontally with either 1, 2, 3 or 4 way throw. This should be selected to suit the room geometry and to provide acceptable velocities in the occupied space.

Construction · Dimensions · Materials

Construction

Type ADLQL ceiling diffuser comprise a diffuser fitted with rear plenum box.

The diffuser face as a border width of either 11mm for flush mounting into T-bar ceiling or 27mm so that the border is surface mounted covering the ceiling opening, for example in plaster ceilings. The plenum box is supplied with circular spigots for top or side entry. The side entry plenum box can also be provided with internal acoustic lining and or volume control damper operable from the diffuser face (core removed).

Dimensions

SIZE	∅D	DA1	DA2	H1	K1	Q1	Q2	K2
300	149	290	300	300	273	336	298	269
400	199	390	400	340	373	436	398	369
500	249	490	500	390	473	536	498	469
600	299	590	600	455	573	636	598	569
625	299	-	625	455	598	-	623	594

Note : Size 625 is only available for types ADLQL -P-H., and AADLQL-P-V..

Materials

- ① Border Frame in aluminium extrusions powder coated in white to RAL 9010.
- ② Perforated face tray in galvanised sheet powder coated in white to RAL 9010.
- ③ Baffle plate disc in galvanised sheet steel painted matt black.
- ④ Diaphragm plate in galvanised sheet steel.
- ⑤ External support bracket in galvanised sheet steel.
- ⑥ Face plate fixing screws in plated steel, colour finished to match face plate.
- ⑦ Plenum box in galvanised sheet steel.
- ⑧ Spigot damper in perforated galvanised steel.
- ⑨ Plenum lining in 25mm thick faced mineral wool.
- ⑩ Air deflector in galvanised sheet steel painted matt black.

Note:

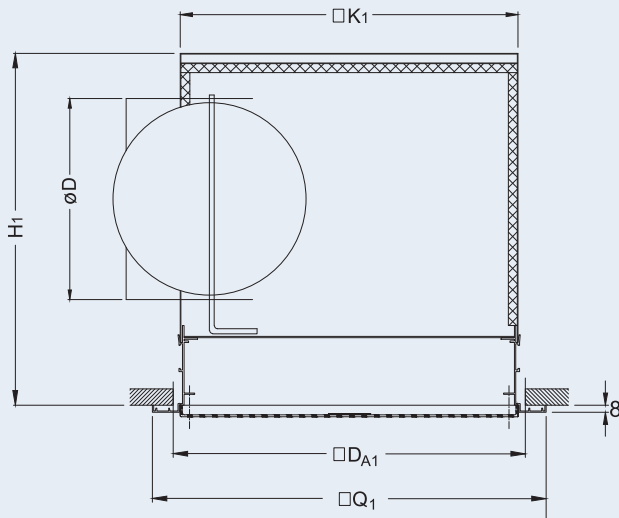
Items 8, 9 and 10 are optional extras and must be ordered in addition to diffuser/plenum detail, see order codes. Items 10 will be supplied loose for site fitting.

Dimensions for diffuser to suit 'T' bar ceiling

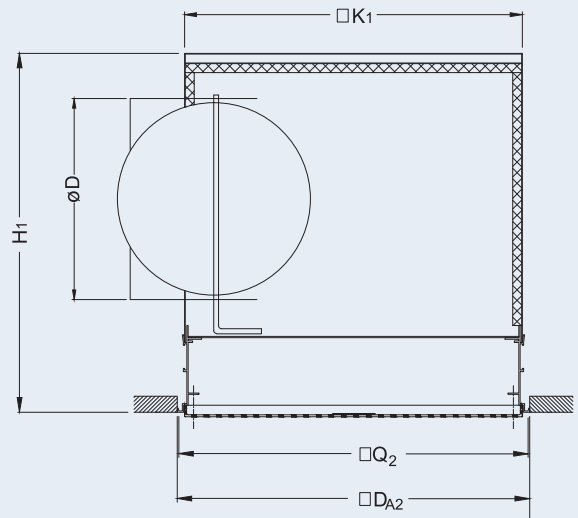
Size	∅D	DA2	H1	K1	Q2
300T	149	300	300	270	295
600T	299	600	455	570	595

The above table applies to types ADLQL-P-H.. and ADQL-P-V.. only
Dim "DA2" is "T" bar centres

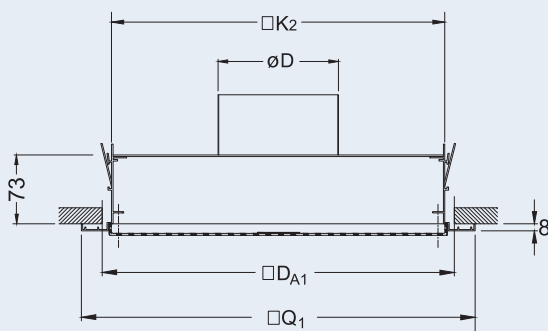
Type ADLQL-K-H-D-M



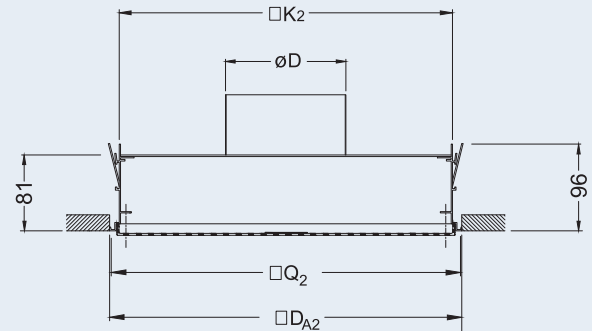
Type ADLQL-P-H-D-M



Type ADLQL-K-V



Type ADLQL-P-V



Direction of Discharge Blanking Plates

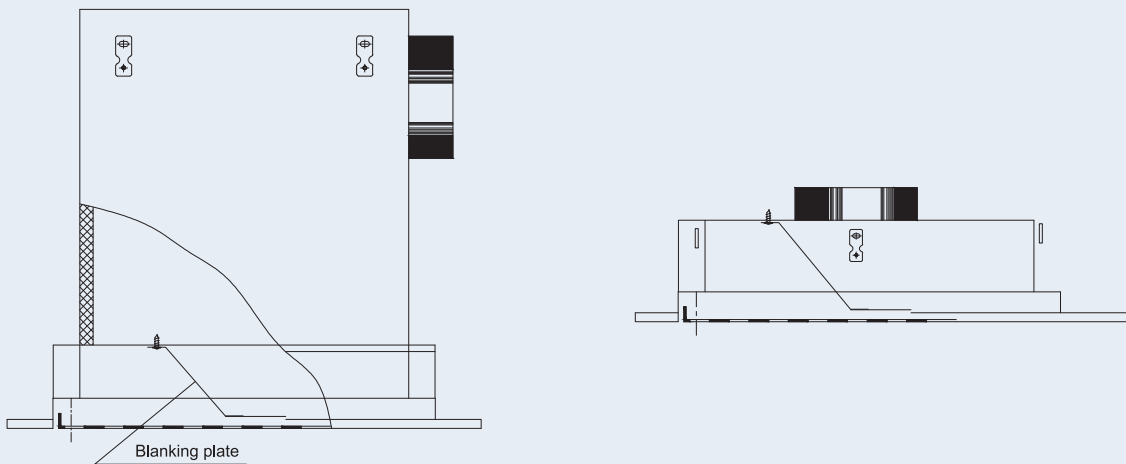
Blanking Plates

To provide various directions of discharge, blanking plates can be supplied as an optional extra.

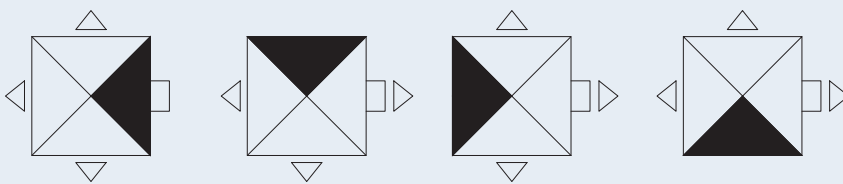
To mount these plates, the perforated sheet face must be removed. The blanking plate is fixed to the plenum box using self-tapping screws.

The fitting is by others on site.

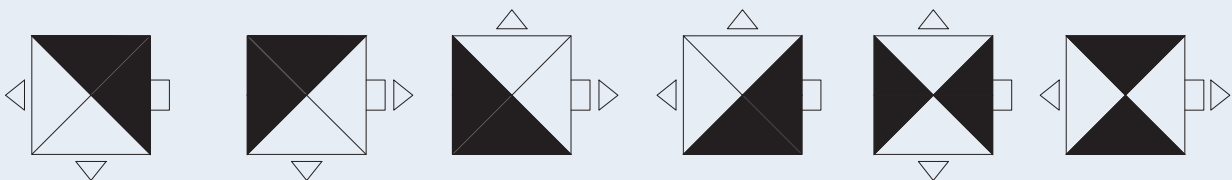
Blanking Plates



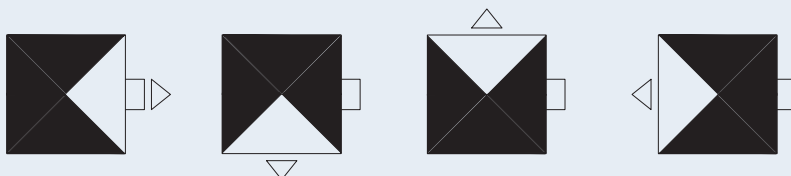
Directions of discharge



1 Blanking plate required per diffuser



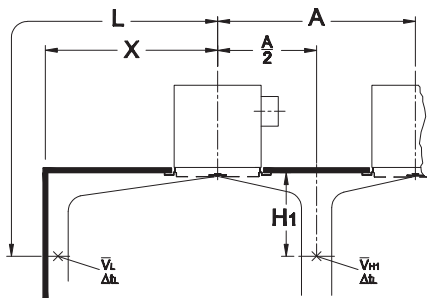
2 Blanking plates required per diffuser



3 Blanking plates required per diffuser

Nomenclature Acoustic Data

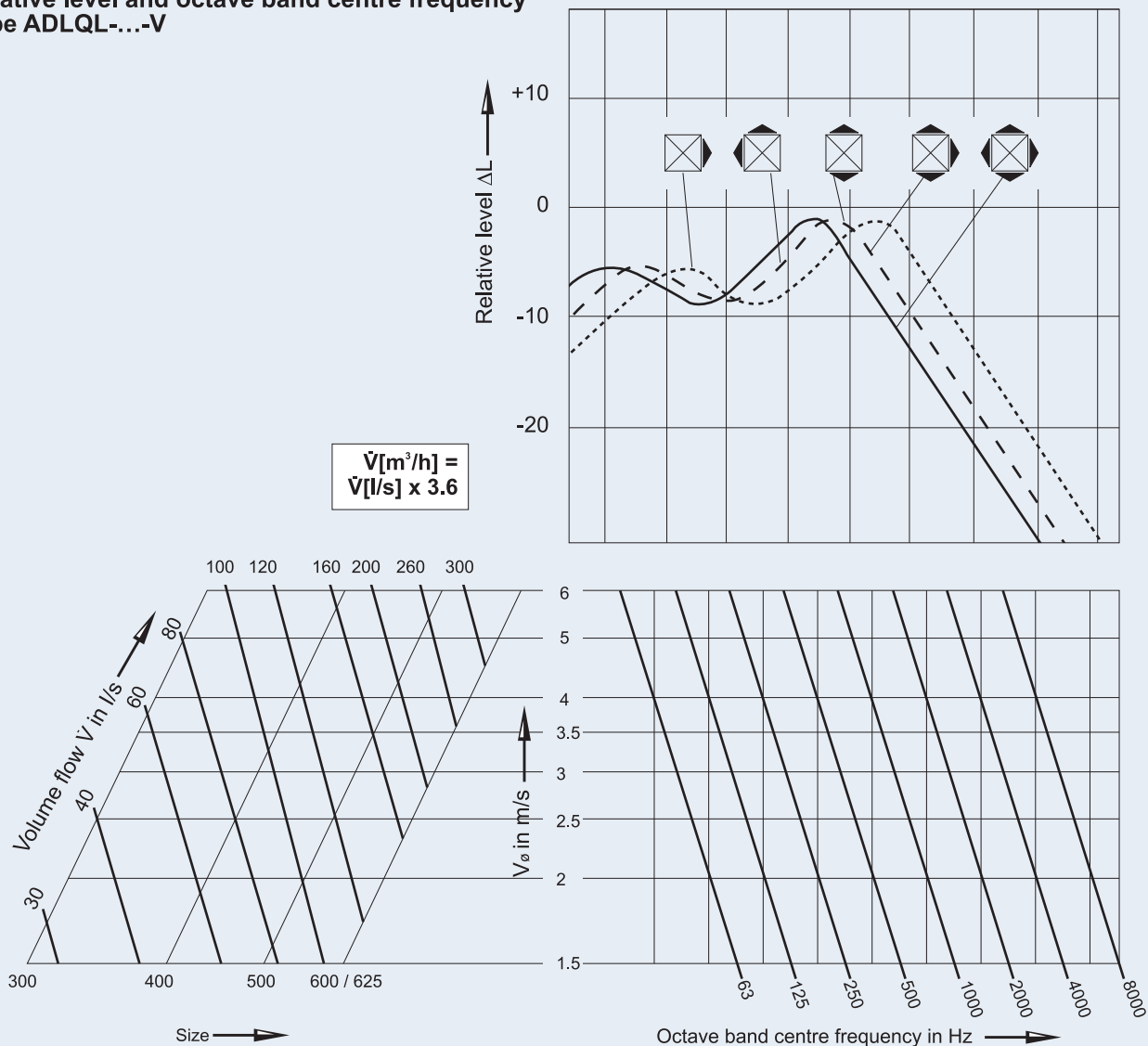
Nomenclature



- \dot{V} in l/s : Volume flow per diffuser
 - in m³/h :
 - \dot{V}_4 in l/s : Volume for 4 way discharge diffuser
 - in m³/h :
- For 3-, 2-, 1-, way discharge enter diagrams using the following:
- 3-way : $\dot{V}_4 = 1.33 \cdot \dot{V}$
 - 2-way : $\dot{V}_4 = 2.0 \cdot \dot{V}$
 - 1-way : $\dot{V}_4 = 4.0 \cdot \dot{V}$

- A in m : Spacing between two diffusers
- H_1 in m : Distance between ceiling and occupied zone
- L in m : Distance from diffuser $L = X + H_1$
- \vec{V}_L in m/s : Time average air velocity at the wall at distance L
- \vec{V}_{H_1} in m/s : Time average air velocity between two diffusers at distance H_1 from ceiling
- V_θ in m/s : Air velocity in inlet spigot
- Δt_z in K : Temperature difference between supply and room air
- Δt_L in K : Difference between core and room temperature at distance $A/2 + H_1$ or $L = X + H_1$
- Δp_t in PA : Total pressure drop
- L_{WA} in dB(A) : A-weighted sound power level
- L_{WNC} : NC rating of sound power level
- L_{WNR} : $L_{WNR} = L_{WNC} + 2$
- L_{PA1} L_{PNC} : A-weighting and NC rating respectively of room sound pressure level $L_{PA} \approx L_{WA} - 8$ dB
- $L_{PNC} \approx L_{WNC} - 8$ dB
- ΔL in dB/oct : Relative level with respect to L_{WA}
- L_w in dB/oct : Octave band sound power level of regenerated noise $L_w = L_{WA} + \Delta L$

1 Relative level and octave band centre frequency Type ADLQL-...-V



Acoustic Data

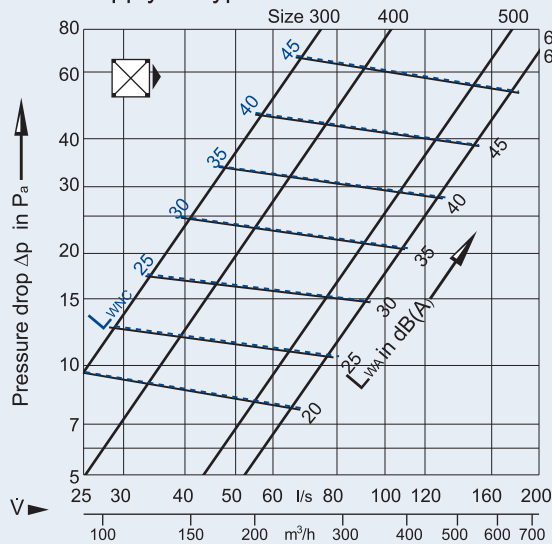
Insetion loss in dB/octave with internal lining (includes end reflection loss)

Size	Octave band centre frequency in Hz							
	63	125	250	500	1000	2000	4000	8000
300	15	15	8	16	18	15	15	15
400	12	12	10	16	16	14	14	14
500	10	10	11	16	14	14	14	14
600	8	8	13	16	12	13	13	13
625	8	8	13	16	12	13	13	13

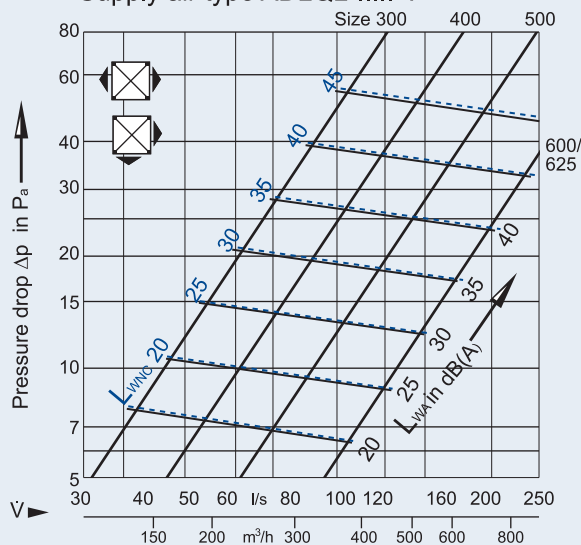
Insetion loss in dB/octave without internal lining (includes end reflection loss)

Size	Octave band centre frequency in Hz							
	63	125	250	500	1000	2000	4000	8000
300	15	15	6	10	13	7	5	5
400	12	12	8	10	11	6	5	5
500	10	10	9	9	8	6	5	5
600	8	8	9	9	5	5	5	5
625	8	8	9	9	5	5	5	5

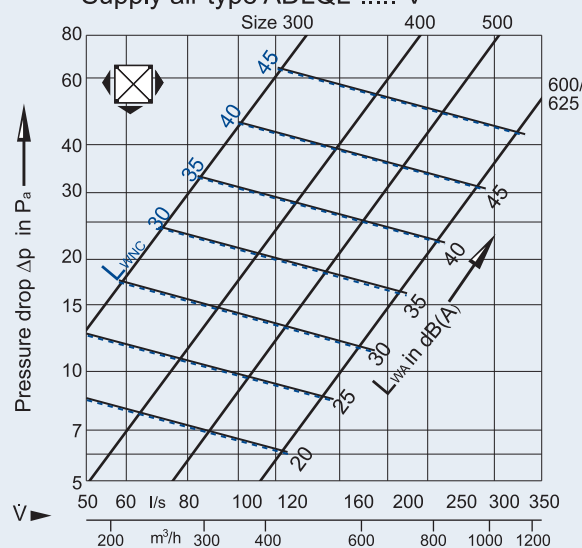
2 Sound power level and pressure drop Supply air type ADLQL-.....-V



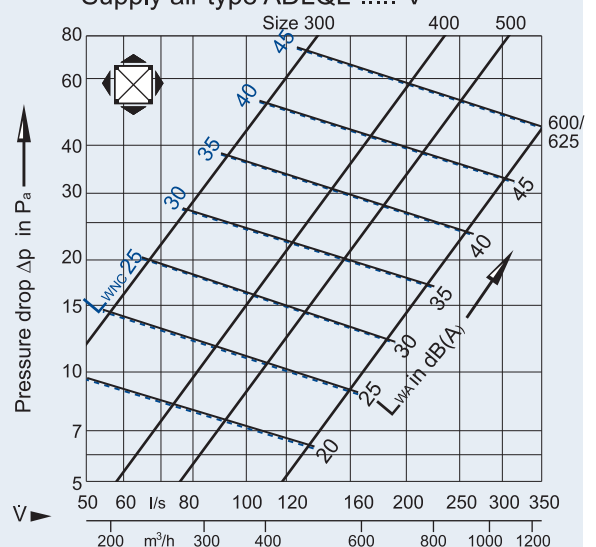
3 Sound power level and pressure drop Supply air type ADLQL-.....-V



4 Sound power level and Pressure drop Supply air type ADLQL-.....-V



5 Sound power level and Pressure drop Supply air type ADLQL-.....-V



Example

Data given:

Type ADLQL-...-H; size 400

Volume flow with 4 way discharge

$$\dot{V} = 110 \text{ l/s}$$

Damper angle

$$= 30^\circ$$

Required: Octave sound power level of regenerated noise L_w

Diagram 12: Sound power level and pressure drop

$$L_{WA} = 46 \text{ dB(A)}$$

$$\Delta p_t = 38 \text{ Pa}$$

$$v_\theta = 3.6 \text{ m/s}$$

Correction from table:

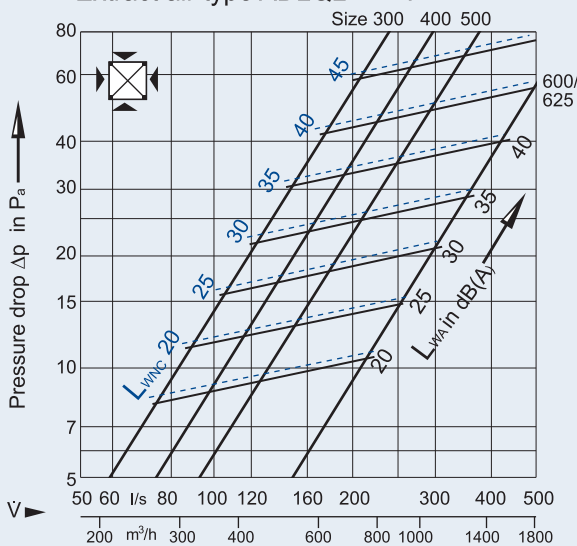
$$L_{WA} = -4 \text{ dB(A)}$$

$$L_{WA} = 46 - 4 = 42 \text{ dB(A)}$$

Diagram 7

Octave band frequency in Hz	63	125	250	500	1000	2000	4000	8000
L_{WA} in dB(A)	42	42	42	42	42	42	42	42
ΔL in dB(A)	-5	+3	-3	-7	-3	-9	-18	-28
L_w in dB	37	45	39	35	39	33	24	14

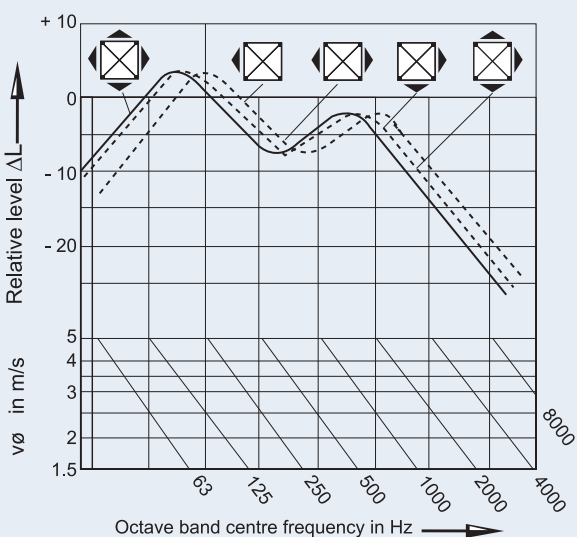
6 Sound power level and Pressure drop Extract air type ADLQL-.....-V



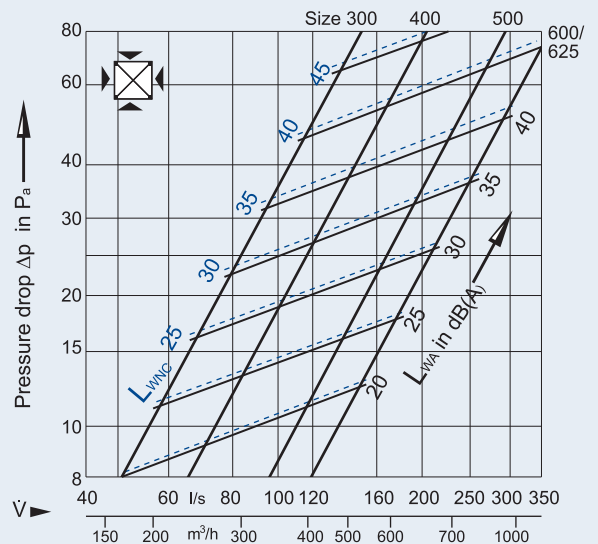
Correction to diagram 8 - 12

Size	300	400	500	600/625
L_{WA}	-6	-4	-2	0
L_{WNC}				0

7 Sound power level and Pressure drop Extract air type ADLQL-...-H



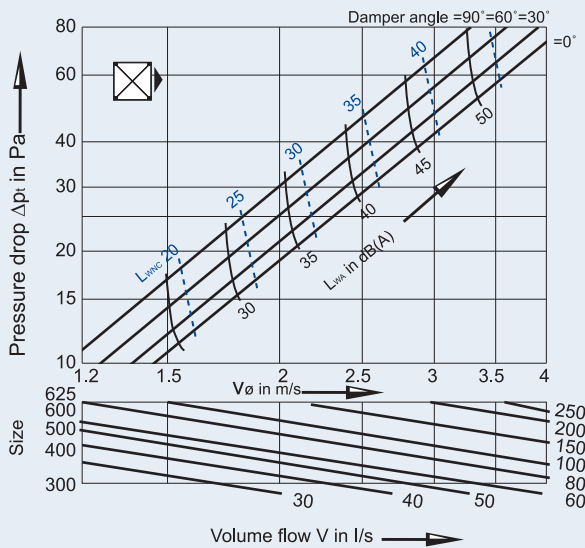
8 Sound power level and Pressure drop Extract air type ADLQL-...-H



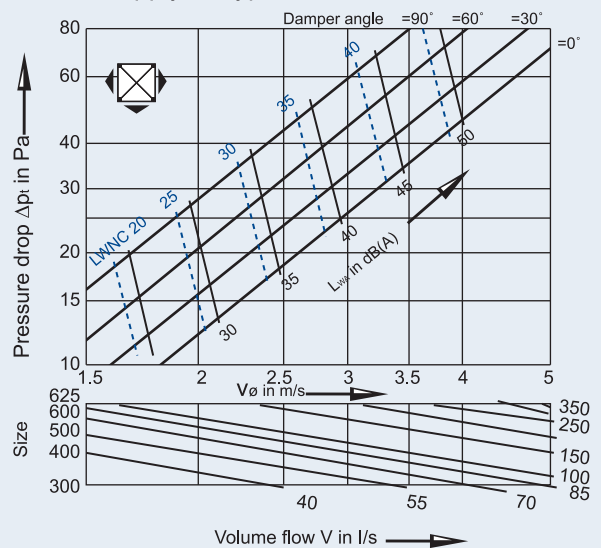
Correction to diagram 8 - 12

Size	300	400	500	600/625
L_{WA}	-6	-4	-2	0
L_{WNC}				0

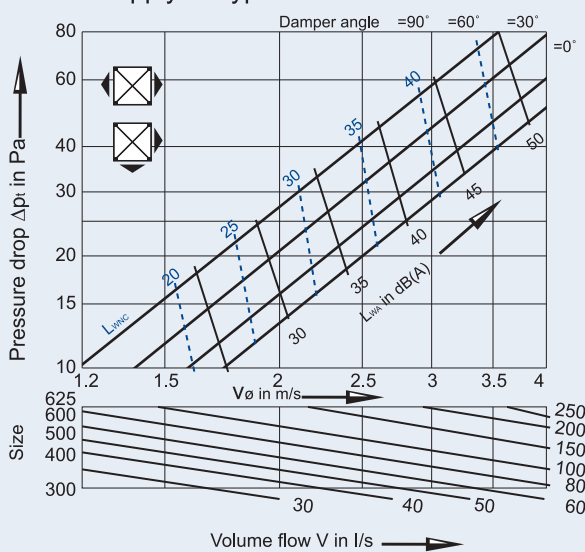
9 Sound power level and Pressure drop
Supply air type ADLQL-...-H



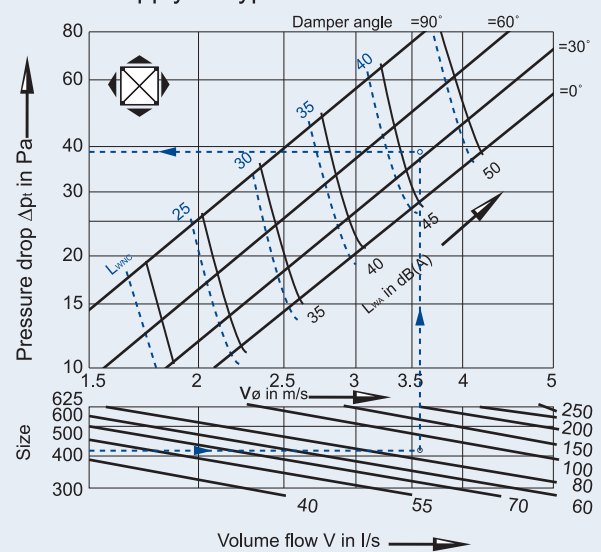
11 Sound power level and Pressure drop
Supply air type ADLQL-...-H



10 Sound power level and Pressure drop
Supply air type ADLQL-...-H



12 Sound power level and Pressure drop
Supply air type ADLQL-...-H



Aerodynamic Data

Example

Data given:

Type ADLQL Size 300

Volume flow 2 way discharge $\dot{V} = 40 \text{ l/s}$

Spacing 1 between 2 diffusers $A = 2.8 \text{ m}^2$

Distance between ceiling and occupied zone $H_1 = 1.2 \text{ m}$

Diagram 13: Air velocity at the wall and temperature quotient

$$\dot{V}_4 = 2 \cdot \dot{V}$$

$$\dot{V}_4 = 2 \cdot 40 = 80 \text{ l/s}$$

$$A/2 = 1.4 \text{ m}^2$$

$$\bar{V}_L = 0.37 \text{ m/s}$$

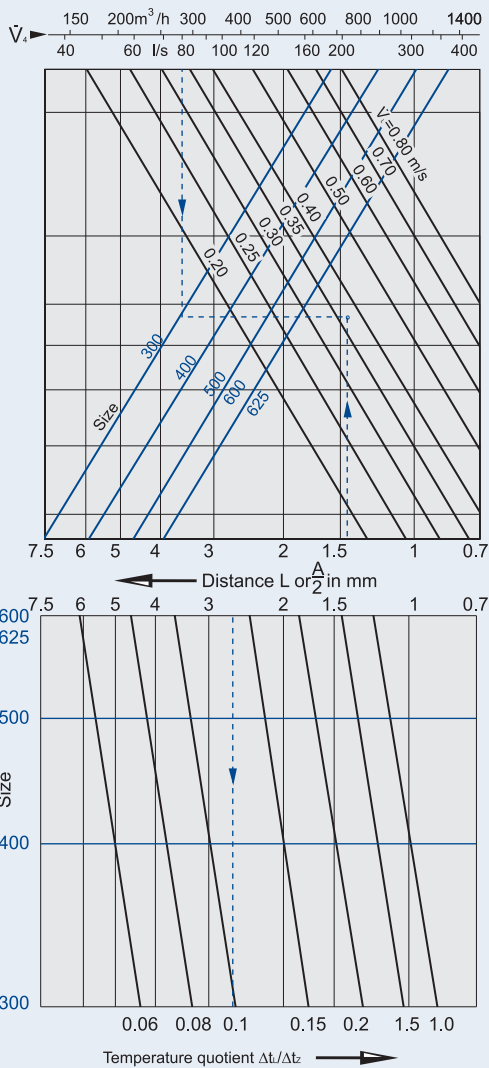
$$L = 1.2 + 1.4 = 2.6 \text{ m}$$

$$\Delta t / \Delta t_L = 0.1$$

Diagram 14: Air velocity between two diffusers

$$\bar{V}_{H1} = 0.17 \text{ m/s}$$

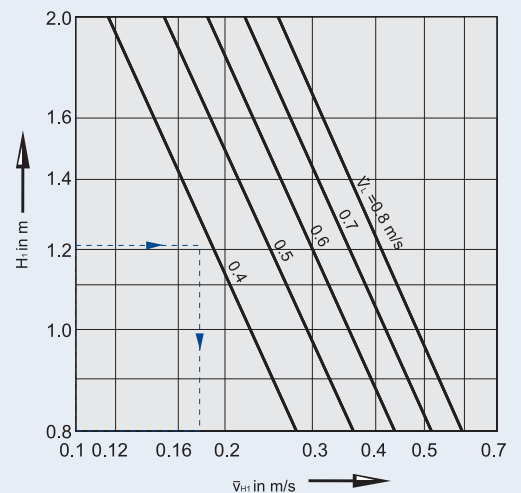
13 Air velocity at the wall and temperature quotient



Effective jet velocity

Size	300	400	500	600/625
A_{eff} in m^2	0.0140	0.0254	0.0360	0.0600

14 Air velocity between two diffusers



Order Details

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Order Code These codes do not need to be completed for standard products

ADLQL-K-V-D-M-I0-E / **500** / **0** / **0** / **S1** / **RAL 9010**

Cover border (face width 27mm) **K**

Flush border (face width 11mm) **P**

Top entry **V**

Side entry **H**

Acoustic lining **D**¹⁾

Volume control damper **M**¹⁾

S = Supply
E = Extract

300
400
500
600
625(2)
300T
600T
Size

To cut T bar (see page 3)

1) Only available with side entry plenum.
2) Only available with flush fitting border.

Not used

0 - Powder coated to **RAL9010 matt white (Standard supply)**

S1 Powder coated to other RAL number

Options
Extract diffusers can be supplied in all types, these will be without baffle plate (3) and deflectors (10) and will have the suffix **E** added to the code. (see page 3)

I0 - No internal insulation (Standard)
I1 - 6mm thick rubber foam
I2 - 25mm fibre glass insulation

Accessories
AB = Blanking plate
Please order accessories separately, stating size required.

Specification Text
Square ceiling diffuser for horizontal discharge, comprising face section and border 27mm (or 11mm) wide. Screw fixed perforated plate core with returned edges complete with fitted baffle plate. Also with rear plenum box with internal diaphragm plate with circular top or side entry spigots, optional items, volume control damper and internal acoustic lining. Plenum box is firmly riveted to the diffuser face, 4 suspension brackets provided to hang assembly from ceiling slab.

Materials
Face border and neck section will be fabricated from aluminium extruded section, material spec. BS 14746063T6.
Perforated face panel with return edges, side entry plenum, top entry spigot plate and all internal baffles and deflectors plate manufactured from galvanised sheet steel.
Material spec. BS 2989 Z2 G275 M.

Internal acoustic lining is 25mm thick mineral wool with facing to prevent particle migration, treated joints and edges.

Finish
Border and face panel will be finished painted stoved white to RAL 9010. Plenum and top tray sections will be natural. Deflectors and centre baffle plate disc will be painted matt black.

Order Example
Make: TROX
Type: ADLQL-K-V-D-M/E/500
Accessories: AB