VIBRO - \COUSTICS® A Swegon Group company



Cross-Talk Silencers

Cross-Talk Silencers

Designed For

Commercial Buildings Public Buildings Schools Hospitals Hotels / Motels Apartments Condominiums Industrial Offices Prisons

Located In

Ceilings Ducts Doors Walls

Serving

Private Rooms Offices Conference Rooms Halls Vents Bathrooms Kitchens

Features

Lower cost via factory production Minimal space installation requirements Design to attenuate speech Reduce cross-talk intrusion via connecting ducts & return air openings Improve speech privacy Low aerodynamic pressure drop for easy door opening

REDUCE SPEECH INTRUSION INTO ADJOINING ROOMS



DESIGNATION CT



 $A \times B$ — Opening or duct width

C — Includes slip connections for adaptation to elbows, grilles, ducts, etc.

Small Volume Orders

- Assembled from stock, straight through half modules fastened together
- Elbows and grilles suppled by others

Large Volume Orders

- · Assembled to customer specifications
- Usually with elbows suppled by others
- · Grilles by others

FACTORS INFLUENCING SELECTION

- Degree of listener tolerance to speech intrusion
- Speaker's voice loudness, distance from opening, etc.
- Degree of speech privacy required
- Adjoining opening size, path length, elbows, etc.
- · Wall sound transmission class (STC rating)
- Background noise levels in the receiving room
- · Acoustic absorption properties of the room surfaces
- Short circuiting sound paths through doors, holes for piping, electrical services, etc.
- Airflow rates to permit easy door opening without lifting ceiling tiles, etc.

SPEECH PRIVACY SELECTION GUIDELINES

For most people, speech privacy without noticeable distraction is only probably if intruding speech levels are at least 20 dB below room background levels. A mere 10 dB reduction is completely ineffective because sufficient speech intelligibility remains for almost total comprehension to occur.

Critical situations involving music, or highly secure speech privacy demand thorough acoustic analysis. Contact Vibro-Acoustics for assistance.

DEGREE OF SATISFACTION VS. COST

The degree of satisfaction attained depends on the total interaction of the above factors. No single noise reduction rating can therefore hope to encompass all possible applications. Yes the cost of thorough acoustical analysis is not usually warranted, and would likely exceed the cost of the cross-talk silencing itself. Thus, reliable, quick selection charts and guidelines are necessary for usual applications (offices, etc.)

Vibro-Acoustics' quick selection charts and guidelines are on pages 6 and 7 of this brochure. Data for critical situations is obtainable form our technical representatives.

We reserve the right to make design and quality changes to our products without notice or obligation.

COST OF CT SILENCERS

Using mass production, Vibro-Acoustics can supply cross-talk silencers at less total cost, (less dB than field manufactured units.

REDUCE SPEECH INTRUSION INTO ADJOINING ROOMS

STOCK CROSS-TALKS

- Speech attenuators for small volume orders
- Less expensive and with more attenuation than field fabricated units
- 3" (75 mm) slip connections for adaptation to ducts, elbows, grilles, etc.
- Galvanized construction



Half modules factory assembled to fit duct size (field assembly by contractor is also possible)

Stock half module

• Designed to customer's requirements:

(dimensions, acoustics, materials, media protection,

· For situations involving highly confidential speech

Contact your Vibro-Acoustics technical representative

· When music or other wide spectrum sounds are involved

• For large volume orders

connectors and finish)Custom design is advised





CROSS TALK SIZES AND ARRANGEMENTS

Stock Cross-Talks

· Are assembled from two basic module sizes, and two basic lengths

Duct or Opening Size			Length Model	& Dimension C	Duct or Opening Size					
A	× B inc	hes	CT - 24	CT -30	A	A × B mm				
4" × 8"	or		24"	30"	102 × 203	or				
8" × 8"	or	4" × 16"	(610 mm)	(780 mm)	203 × 203	or	102 × 406			
8" × 12	' or	4" × 24"			203 × 305	or	102 × 610			
12" × 12	" or	8" × 16"			305 × 305	or	203 × 406			
16" × 12	16" × 12" or 8" × 24" 406 × 305 or 203 × 610									
Standard silencers are economical in this shaded area. They can be selected from the Rectangular Silencer brochure (SIL.030). Usually 10 or 12 RSS-N or 0 model silencers will suffice.										

Custom Cross-Talks

- Are factory assembled to customer's requirements, usually with elbows provided by others and field installed by others.
- Acoustics elbows can be an integral part of the design if acoustically warranted.
- Custom Cross-Talks are only economical on large volume orders. Consult our technical representative for further information, design data, etc.

TYPICAL ARRANGEMENTS



"S" denotes length of slip connection. Unless otherwise specified, this will be 3" (75 mm)

CT SELECTION PROCEDURE For normal applications

The following selection procedure will guide you to an appropriate CT silencer selection for common everyday applications involving slightly raised voices as in bathroom-to-bathroom or office-to-office situations.

Critical selections involving highly confidential speech, music, or other broad spectrum noise require much more careful acoustical analysis. Consult our technical representative for assistance. (e.g. prisons, professional offices, music rooms, etc.)

TEST DATABASE:

Vibro-Acoustics has a broad laboratory database involving roomto-room and ducted cross-talk testing of numerous models, media arrangements and unusual configurations.

STEPS	PROCEDURE	ADVICE
1. Preliminary	Establish: • Approximate room background noise level or NC level • Wall sound transmission class (STC rating) Recall that adequate speech privacy in ordinary situations probably occurs if speech levels are reduced at least 20 dB below room background levels.	Cross-talk silencers do not improve the noise reduction of a wall. Improper selection can degrade the wall.
2. Acoustic Selection	Using the guideline noise reduction charts (see page 7) for each of your selections, establish: • The number of CT silencers required • Length, model and dimension C of the silencer required	e.g. Bathroom - two CT silencers each 30" (760 mm) long approximate an STC-50 wall
3. Pressure Drop	 A. Establish Flow volume rate for adequate ventilation Appropriate pressure drop for each silencer Whether it is wall or duct mounted B. From guideline flow volume rate vs Δp chart (see page 6) this brochure), establish silencer A × B dimensions. C. Apply appropriate corrections from the approximate corrections chart. (see page 7) 	A child or small adult will have difficulty opening a closed door if total pressure drop across the door $\Delta p > 0.05$ " H ₂ O (12.5 Pa)
4. Specification	Specify your Vibro-Acoustics CT silencer as shown in the sample specification chart. (see page 8)	Our technical representative can help you.

GUIDELINE SELECTION CHARTS Non-critical situations

The charts presented herein give approximate data to help guide you to a quick selection for most noncritical speech cross-talk applications. Should music, broadband noise, or highly confidential speech situations be involved, you should perform your own more detailed noise reduction analysis.

CALCULATION BASE FOR CHARTS

- Rooms are average sizes with typical acoustical properties
 room background noise follows NC levels closely
- Voice levels are 5 dB louder than normal conversational levels voices originate at typical locations in the room, rather than right against grille openings

SPECIAL SELECTION ADJUSTMENTS

- Louder voicesWalls > STC 50
- Walls 010 00
- Music
- Highly secure
 speech privacy
- Sensitive listeners

Use greater XTS lengths, or use standard silencers Also check flanking paths.

These demand thorough acoustical analysis. Contact Vibro-Acoustics Ltd. for advice

BEWARE: Cross-talk silencers are not intended to substitute for broadband, high insertion loss silencers. They are merely intended to silence normal speech. Thus the bulk of their silencing is provided in the speech interference range indicated on the graphs by the shading. (See page 7)

VOLUME FLOW RATES* For easy door opening

Stock Sizes Model A × B In. H ₂ 0			One	CT-24			One	CT-30		Stock Sizes			
		In. H ₂ 0	0.025	0.05	0.025	0.05	0.025	0.05	0.025	0.05	A × B mm		
		pascals	6.3	12.5	6.3	12.5	6.3	12.5	6.3	12.5			
		in a	duct	in wall	opening	in a	duct	in wall o	opening				
4" × 8"	or		90	125	70	95	80	115	65	95	102 × 203		
8" × 8"	or	4" × 16"	180	250	140	195	160	230	125	185	203 × 203	or	102 × 406
8" × 12"	or	4" × 24"	270	380	210	290	240	340	190	280	203 × 305	or	102 × 610
12" × 12"	or	8" × 16"	405	570	315	430	360	510	285	420	305 × 305	or	203 × 406
16" × 12"	or	8" × 24"	540	760	420	585	480	680	370	560	406 × 305	or	203 × 610

* Above flow rates are in CFM for CT models without grilles. For metric flow rates use scale below.

VOLUME FLOW CONVERSION



• 1 dm ³/s is equivalent to one litre/second

• 1000 dm ³/s = 1 m ³/s

NOISE REDUCTIONS IN TWO TYPICAL CROSS-TALK APPLICATION

OFFICE-TO-OFFICE

Cross-Talk though ceiling plenum return opening and light troffers.



BATHROOM-TO-BATHROOM

Cross-talk through adjoining ductwork that includes two elbows on each side branch.



- Select the CT model combination from the coloured zone of the appropriate graph that reduces speech an average* of 20 dB below room NC background level. *(Average of 500, 1000, and 2000 Hz octaves)
- Less than 20 dB "may have to be tolerated" when limited by lower STC wall noise reduction or flanking due to holes in wall construction, doorways, windows, etc. Consult Vibro-Acoustics for advice.

APPROXIMATE CORRECTIONS

	Choose having	a raduation impor	avamant	0.025 volume	flow case	0.05 volume flow case		
CONFIGURATION	Speech nois	e reduction impr	overnent	Pressure drop increase				
	500 Hz	1000 Hz	2000 Hz	in. H ² 0	Ра	in. H ² 0	Ра	
One miter elbow on unducted CT				+0.001	0.25	+0.003	0.75	
Two miter elbows on unducted CT		Soo Noto 1 Polo		+0.002	0.50	+0.009	2.3	
One radius elbow next to ducted CT		See Note I Beit	JVV	+0.003	0.75	+0.005	1.3	
Two radius elbows next to ducted CT				+0.025	6.3	+0.045	11.2	

Notes:

1. When using elbows, one is conservative to use only the above Noise Reduction graphs. For more accurate detailing consult an acoustical manual, (ASHRAE Systems Handbook). The correction depends on elbow size, shape, location, etc.

2. The above Δp corrections apply to the flow volume rates on page 6 for all sizes listed. However, if a different flow rate is used, pressure drop can be determined using:

 Δp corrected for flow rate = Δp chart ×

flow rate desired	
chart flow rate	

3. Room hardness corrections

- · For harder than typical rooms use longer CT models than indicated above
- · For softer rooms, use the models indicated above

STOCK CROSS TALK APPLICATION ARRANGEMENTS Elbows & Grilles supplied by others



* These applications may require custom silencers

TYPICAL SPECIFICATION

- Supply Vibro-Acoustics Cross-Talk silencers of type and size as shown in the drawings.
- All silencers shall be of galvanized sheet metal construction throughout. Acoustic media shall be inorganic, rot, odor and moisture proof, and protected by perforated metal to maintain low pressure drops.
- All inlets and outlets are to be suitably rounded for better flow and pressure drop performance.
- Elbows, grilles, etc. are to be supplied by others.

	TYPICAL SELECTION SCHEDULE													
	_				Dime	nsions			Δp Flow		Location	Configuration		
Silencer No.	System No.	Silencer Model		A		В		L	in H O	Do	CEM	dm ³ /c		
		incusi	in.	mm	in.	mm.	in.	mm.	ш. п ₂ 0	Fd	CFIVI	unitys		S - Straight
XT-1	SF-2	CT 30	8	203	16	406	30	760	0.017	4.3	300	140	Duct	L - Elbow
XT-2	SF-4	CT 24	12	305	12	305	24	610	0.023	5.8	300	140	Wall	U - U-Shape
XT-3	RF-6	CT 24	16	406	12	305	24	610	0.023	5.8	400	190	Wall	Z - Z-Shape

		CT SILENCER SUBM	1ITTAL				
Project:			Comments:				
Customer:							
Consultant:							
Dwg No.:	Rev.:	Drawn by:					
V-A Project Manager:							
TAG:			DATE:				

	SELECTION SCHEDULE													
	_		Dimensions			Δр		F	low	Location	Configuration			
Silencer No.	System No.	Silencer Model		A		В		L	in H O	Pa	CEM	dm³/s		
			in.	mm	in.	mm.	in.	mm.	III. II ₂ 0	га	CLINI			

* 5:3" (76 mm) slip connection



		CT SILENCER SUBM	MITTAL				
Project:			Comments:				
Customer:							
Consultant:							
Dwg No.:	Rev.:	Drawn by:					
V-A Project Manager:							
TAG:			DATE:				