T03/02856C
曾 泉 江 鐵 器 廠
CHAN CHUAN CHANG METAL WORKS
BLOCK 5055, ANG MO KIO INDUSTRIAL PARK 2, #01-1141,
SINGAPORE 569558 TEL : 64817736 FAX : 64813517
Email: sales@ccc.com.sg Website: http://www.ccc.com.sg
Reg. No. 204949/00M

VOLUME CONTROL DAMPER

Brand : CCC

AIR DIFFUSION EQUIPMENT
VOLUME CONTROL DAMPER
Series : CCC-VCD

CHAN CHUAN CHANG METAL WORKS

VISION

"To produce high quality products, high standard of creativity in design and excellent credibility in reputation"

MISSION

"Serve customer with satisfactory and reliable works and products"

Chan Chuan Chang Metal Works was established in 1975, committed to the vision to manufacture good quality Air Diffusion Equipment. After building up its reputation in the industry as a top manufacturer, the company registered the logo with the Registry of Trade and Patents (Singapore). From then onwards, all equipment which has the trade mark symbolise our commitment to serve our customer with satisfactory and reliable works and products.

Our products have been tested by VIPAC, testing laboratory at Victorian technology Centre, Port Melbourne, Victoria. Furthermore, the results are NATA Certified (National Association of Testing Authorities, Australia) to ADC 10623 R3 (Air Diffusion Council, USA) and are officially endorsed in countries which are signatories to the I.L.A.C agreement-namely, Australia, New Zealand, Britain, USA and Malaysia.

We were proud to introduce the **Heavy Duty Aluminium Computer Floor Grille**, Series : CR to the industry in 1991. This has been a breakthrough as the grille are able to provide adequate air flow whilst maintaining the weight of any person or equipment. This is verified by the Comprehensive Loading Test performed by Singapore Institute of Standard & Industrial Research (SISIR), currently known as Spring Singapore. Series : CR has since then been installed in many computer rooms, wafer manufacturing plant and places which require the product.

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COMPANY MILESTONE

1975 Established with the vision to manufacture high quality Air Diffusion Equipment to meet future needs and demands. Together with a team of experienced Engineers & Craftsman dedicated to Chan Chuan Chang's Motto – Commitment, Creativity & Credibility, we produced good quality products with high standard of creativity in design and maintained excellent credibility in reputation.

1982 Registered with the Registry of Trade and Patents (Singapore), CCC Trade Mark has since became a household name in its industry.

1986 Chan Chuan Chang (CCC) products are tested by VIPAC, a testing laboratory at Victorian Technology Centre, Port Melbourne, Victoria. These results are NATA Certified (National Association of Testing Authorities, Australia) to ADC 10623 R3 (Air Diffusion Council, USA) and are officially endorsed in countries which are signatories to the I.L.A.C agreement – namely, Australia, New Zealand, Britain, USA and Malaysia.

1991 CCC Aluminium Computer Floor Air Grille was sent for Comprehensive Loading Test conducted by Singapore Institute of Standard & Industrial Research (SISIR) and achieved excellent results.

1997 CCC was awarded ISO 9002 Certification. Our impressive list of satisfied clients is testimony to CCC's motto – Commitment, Creativity and Credibility.

2005 CCC has improved its quality management system with respect to the ISO 9001:2000 standard due to our commitment towards quality improvement in our products and customer satisfaction. We thank you for your faith and support in our products. We will continue to strive harder to exceed your demand & satisfaction.

2012 CCC was awarded ISO 9001:2008 Certification by BVQI Accreditation. CCC also became a certified member of Air Movement and Control Association International (AMCA). Our Low Leakage dampers were tested according to AMCA standards and received certifications.

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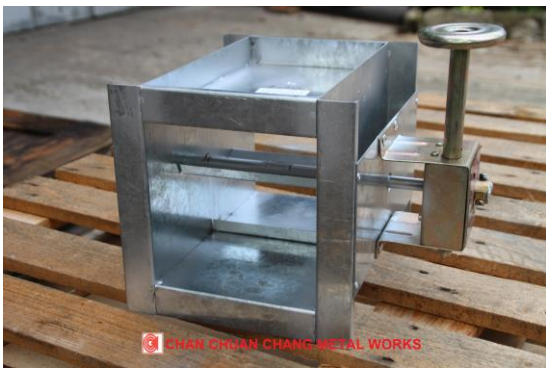

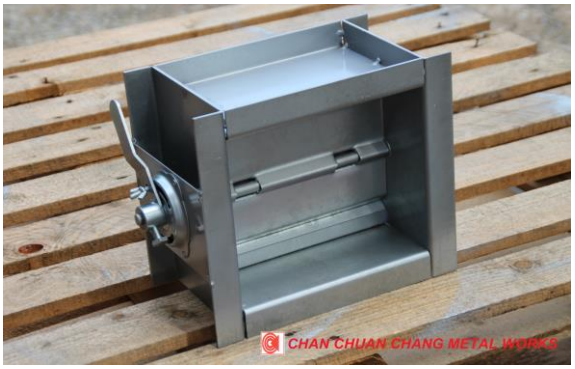

Volume Control Damper c/w quadrant handle

Model : VCD

Description

This model is designed to meet the requirement of the construction industry. They are used to control the amount of air flowing through ventilation duct systems. Our dampers can achieve more than 80% of free area when set fully open, and the low torque drive system can be operated from a single manual quadrant handle. The standard material used for the construction are G.I. Steel with flange for duct mounting. Other material such as stainless steel may be available upon request. The damper casing parts are welded together to form the frame where bronze bush are installed. Blade shaft may be continuous or in sections. Blade linkage may be installed to prevent chatter or blade damage. Multi blades may be constructed when damper width exceeds 300mm. The standard depth of damper is 6”. Unless specified, damper flanges will be supplied without screw holes.

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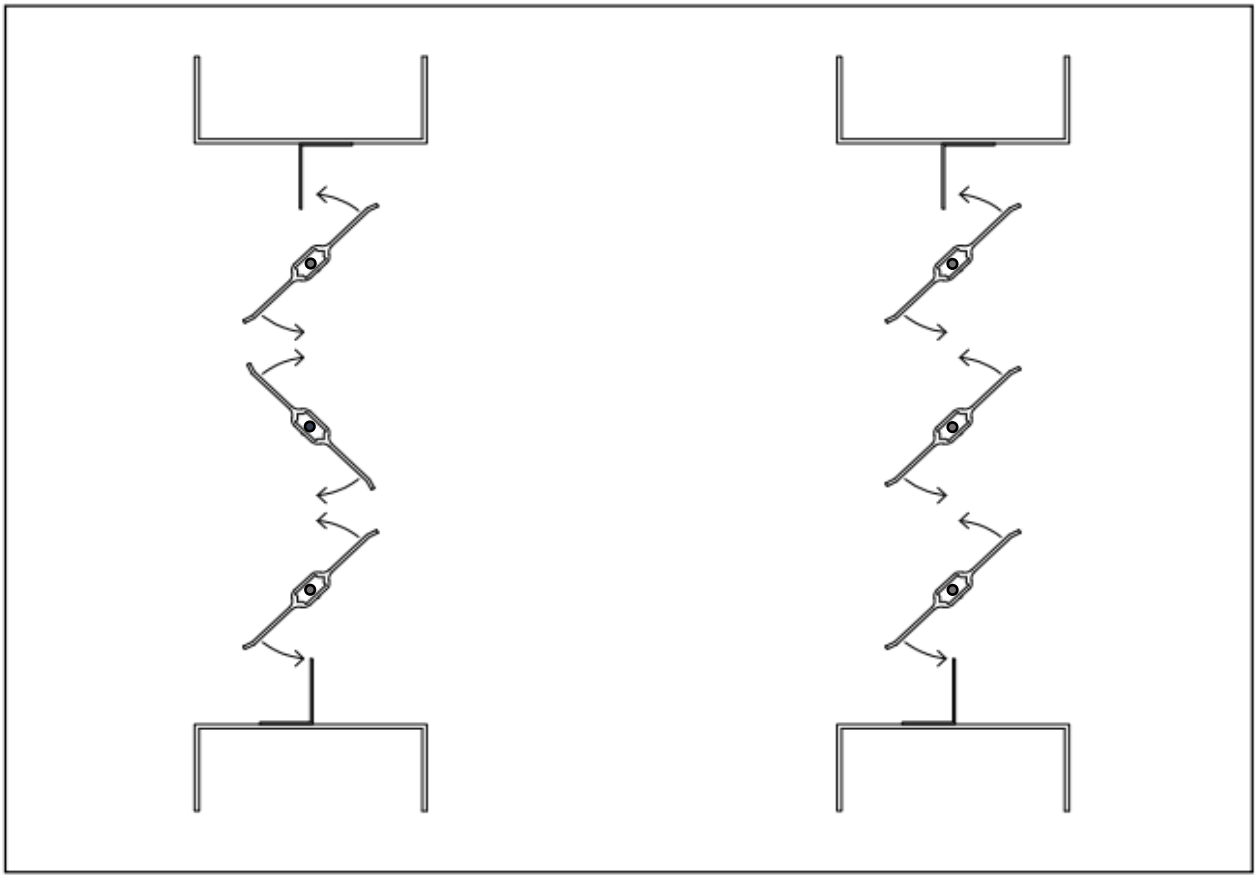
Types of Volume Control Dampers



CCC-VCD-01
Opposed Blade Type

CCC-VCD-02
Parallel Blade Type

Product Features

- High quality G.I. construction (Stainless steel may be requested)
- Multi-blade, opposing rotation/parallel design minimizes torque required for adjustment
- Operating mechanism such as different types of quadrant handles to suit your adjustments of blade from fully closed to fully opened
- Standard construction is flange type (TDF). Slip joints may be requested. Other accessories such as Protection Coatings, Gaskets, Holes etc may be requested.

Application

Volume control damper allows precise adjustment of air quantity through ducting or fan unit.

• Opposed blade action permits equal distribution of air over entire face of grille or device

• For use with grilles, diffusers, and in duct work

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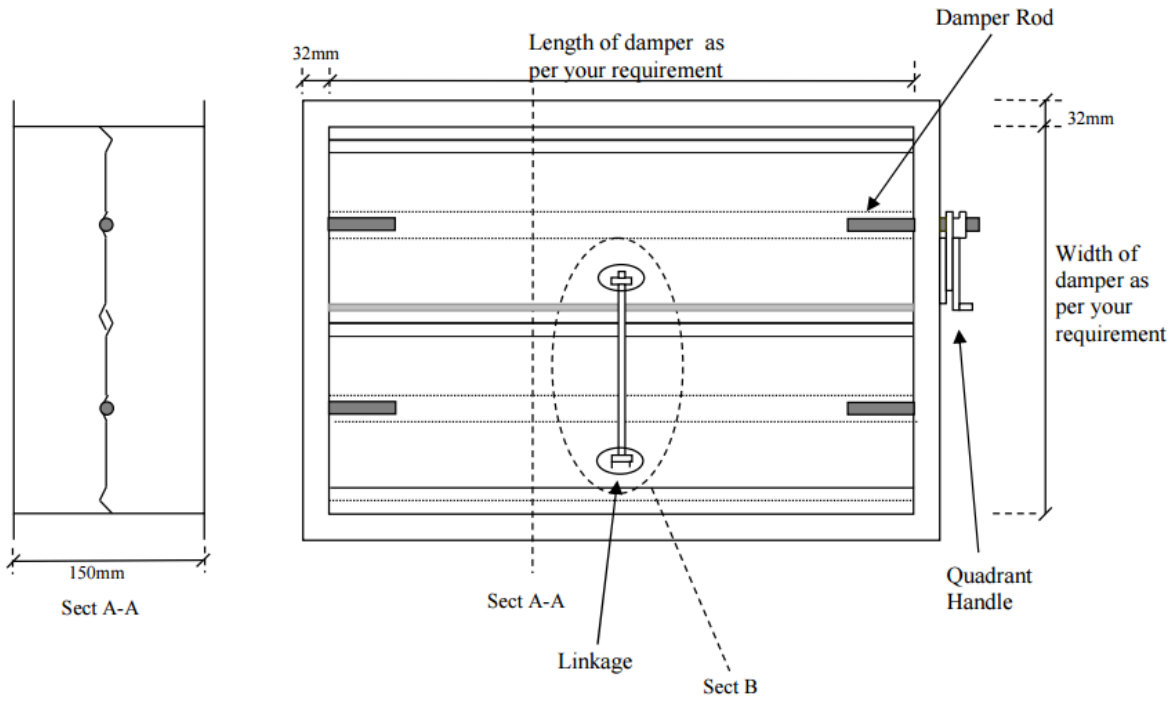
Volume Control Damper c/w quadrant handle

Model : VCD

Design Construction



Construction & Materials

Standard Construction

- Dampers casing and blades are made from high quality galvanised steel sheets (G.I.).
- Bronze bushing (self-lubricating) are used for the shafts of the dampers.
- Steel spindle shaft of 12Ø mm is used.
- Steel shaft and brackets are used for linkages.
- In raw finishing with touch up to welded areas.

Optional

- Stainless steel, aluminium, mild steel or other materials can be manufactured upon request.
- Different type of connectors upon request.
- Flange holes upon request.
- Primers and coatings upon request.
- Any other accessories you required for the dampers please feel free to contact us.

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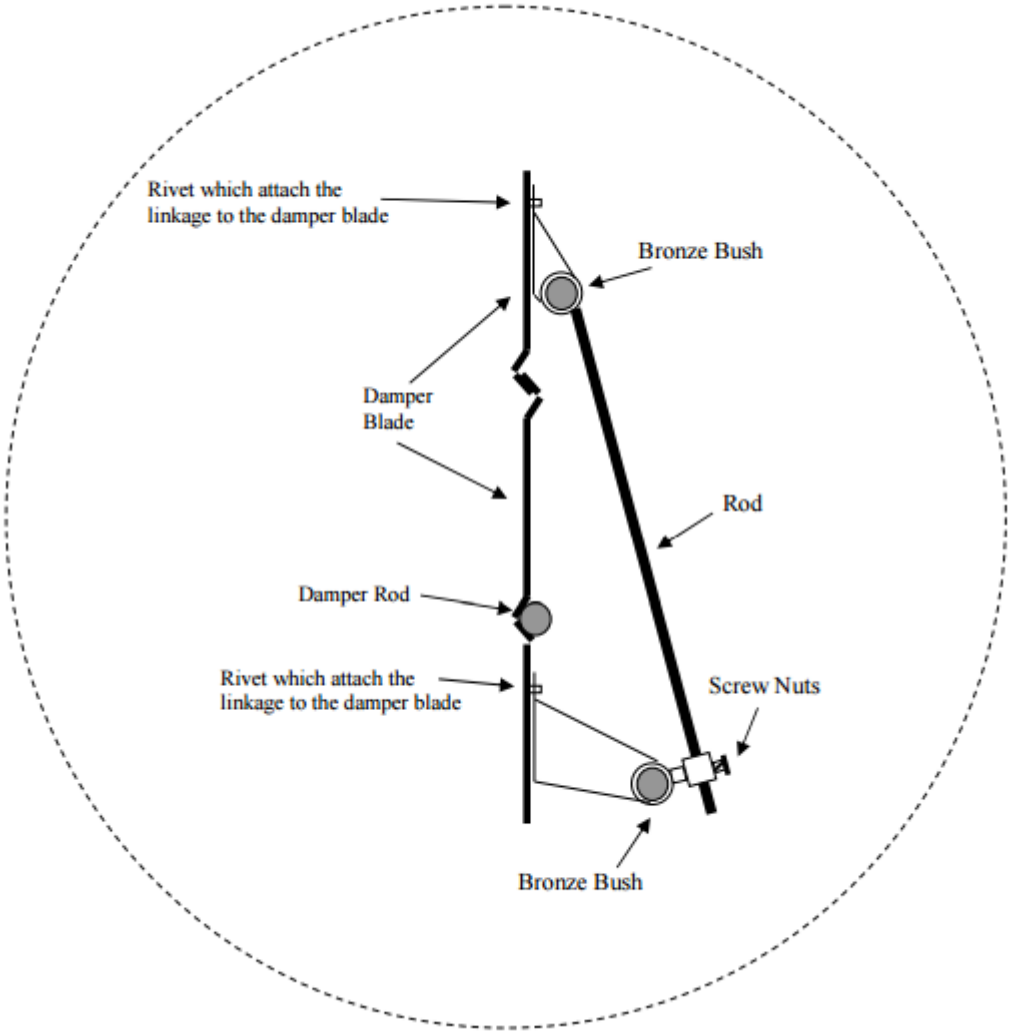
Volume Control Damper c/w quadrant handle

Model : VCD

Design Construction



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Testing Setups for CCC-VCD

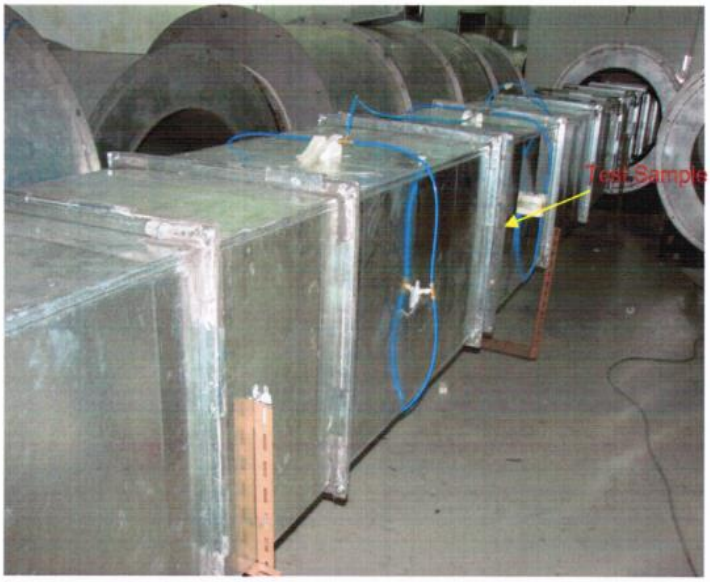

Figure 4 : Test Setup for the Static Pressure Loss Vs Airflow Rate and Discharged Sound Level Test

Figure 6 : Setup of "CCC-VCD 400" Volume Control Damper for Air Leakage Test

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CCC-VCD Performance

Damper Opening		400mm x 400mm x 150mm Volume Control Damper							
25°	Damper Flow Rate (m^3/s)	0.12	0.16	0.20	0.24	0.28	0.32	0.36	0.40
	Pressure loss (Pa)	74	127	183	281	398	511	676	847
50°	Damper Flow Rate (m^3/s)	0.16	0.24	0.32	0.48	0.64	0.80	0.96	1.12
	Pressure loss (Pa)	9	24	48	109	183	301	402	530
75°	Damper Flow Rate (m^3/s)	0.32	0.64	0.96	1.28	1.60	1.92	2.24	2.56
	Pressure loss (Pa)	5	23	47	79	129	191	253	335
100°	Damper Flow Rate (m^3/s)	0.32	0.64	0.96	1.28	1.60	1.92	2.24	2.56
	Pressure loss (Pa)	2	7	13	23	35	47	59	75

Table 1: Static Pressure of "CCC-VCD-400" Volume Control Damper

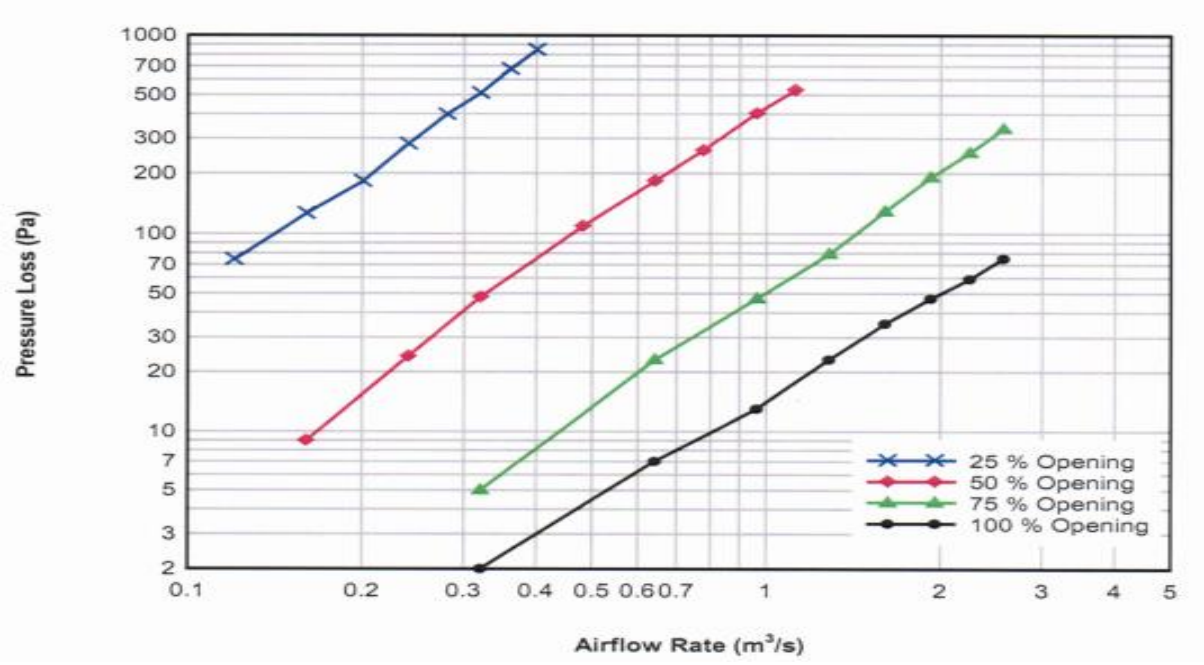

Figure: Static Pressure of "CCC-VCD-400" Volume Control Damper

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CCC-VCD Performance

Frequency (Hz)	Discharged Sound Power Level (dBA) 25% Damper Opening Airflow Rate					
	Q = 0.16m³/s		Q = 0.24m³/s		Q = 0.32m³/s	
50	36.5	45.1	41.2	53.1	42.9	56.1
63	42.3		42.9		46.7	
80	40.4		52.4		55.3	
100	39.7	43.2	51.2	53.8	56.8	60.8
125	36.6		46.0		56.1	
160	38.3		48.3		55.2	
200	39.8	44.1	48.1	52.8	55.2	59.2
250	38.1		47.3		53.4	
315	39.8		48.4		54.6	
400	41.2	49.8	50.2	58.4	56.6	65.2
500	45.8		54.3		61.2	
630	46.5		55.0		61.8	
800	49.0	54.7	54.9	61.2	62.2	67.8
1000	52.4		56.8		63.1	
1250	46.1		57.2		63.7	
1600	44.9	48.8	58.2	61.5	64.4	69.0
2000	44.2		56.5		64.4	
2500	42.8		54.7		63.9	
3150	43.6	47.7	55.8	60.3	64.4	68.8
4000	43.7		56.4		64.9	
5000	41.0		53.9		62.6	
6300	37.1	39.7	50.3	52.7	59.1	61.5
8000	33.4		47.3		56.3	
10000	32.9		43.7		52.7	
Overall A-weighted (dBA)	57.9		67.2		74.6	

Table 2a: Discharged Sound Power Levels of "CCC-VCD-400" Volume Control Damper

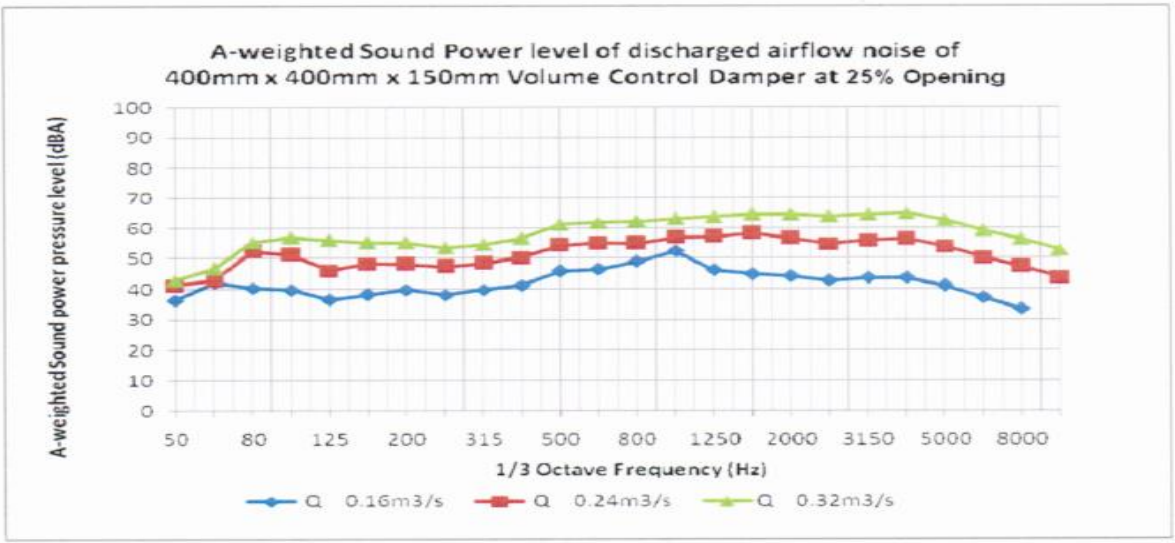

Figure 2a: Discharged Sound Power Levels of "CCC-VCD-400" Volume Control Damper at 25% opening

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CCC-VCD Performance

Frequency (Hz)	Discharged Sound Power Level (dBA) 50% Damper Opening Airflow Rate					
	Q = 0.32m³/s		Q = 0.48m³/s		Q = 0.79m³/s	
50	31.2	35.0	36.2	43.2	45.0	53.9
63	26.2		36.3		45.6	
80	31.5		41.0		52.5	
100	32.0	34.4	41.6	45.4	54.6	58.1
125	25.1		39.2		50.3	
160	29.3		40.7		54.1	
200	34.1	38.7	40.5	46.0	53.5	59.8
250	30.4		40.5		55.6	
315	35.7		42.3		55.7	
400	38.4	44.3	45.3	53.4	57.1	64.4
500	40.6		49.5		60.4	
630	39.2		49.8		60.4	
800	39.9	43.5	49.7	55.4	61.1	66.9
1000	38.6		50.8		62.7	
1250	37.3		51.1		62.4	
1600	35.2	38.0	49.8	53.3	62.6	66.9
2000	33.0		48.8		62.6	
2500	29.6		46.3		61.1	
3150	28.4	31.7	44.1	47.7	60.8	64.8
4000	27.3		43.1		60.3	
5000	24.2		40.9		58.8	
6300	21.1	33.0	36.4	39.3	55.0	57.0
8000	21.4		33.1		51.2	
10000	32.4		33.1		47.5	
Overall A-weighted (dBA)	48.6		59.7		72.5	

Table 2b: Discharged Sound Power Levels of "CCC-VCD-400" Volume Control Damper

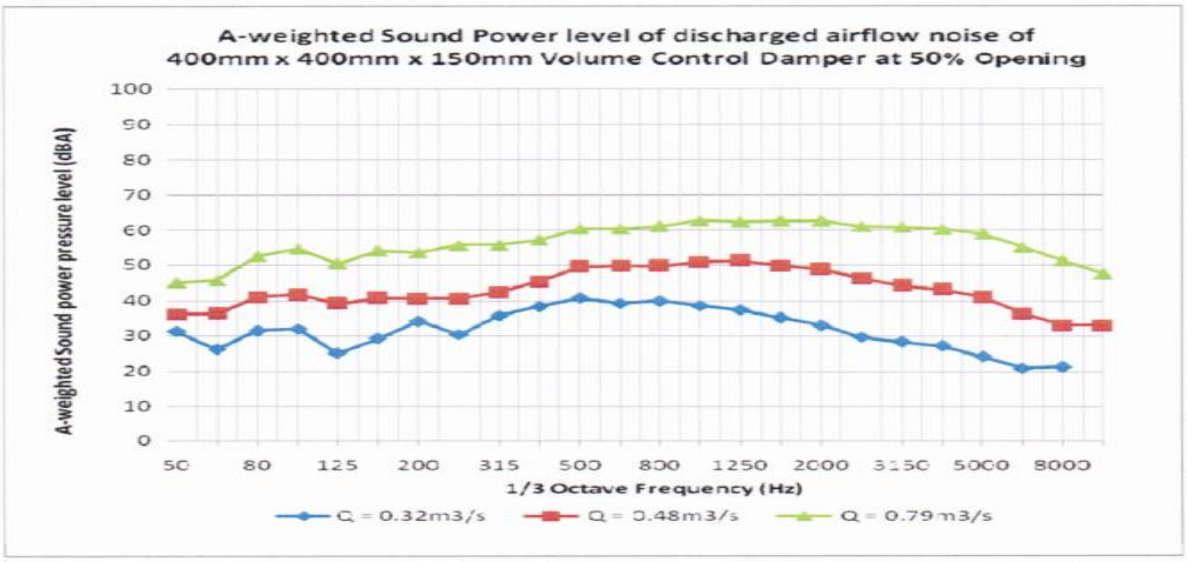

Figure 2b: Discharged Sound Power Levels of "CCC-VCD-400" Volume Control Damper at 50% opening

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CCC-VCD Performance

Frequency (Hz)	Discharged Sound Power Level (dBA) 75% Damper Opening Airflow Rate					
	Q = 0.64m³/s		Q = 1.28m³/s 3/s		Q = 1.92m³/s	
50	29.6	34.5	39.6	49.5	41.7	54.7
63	25.7		37.8		44.3	
80	31.8		48.6		54.0	
100	32.8	34.8	44.1	47.7	52.7	58.3
125	26.8		41.7		54.6	
160	27.9		42.6		53.1	
200	28.0	34.6	42.9	48.3	53.7	59.0
250	28.6		43.1		53.3	
315	31.8		44.3		55.5	
400	35.7	42.6	48.5	55.0	61.4	66.7
500	38.9		50.9		61.9	
630	38.1		50.9		62.4	
800	39.5	44.6	53.3	59.6	61.1	67.7
1000	41.4		56.3		63.9	
1250	37.7		54.3		63.4	
1600	36.2	38.4	54.1	57.3	63.9	67.5
2000	33.4		52.6		63.0	
2500	28.1		49.7		60.8	
3150	25.5	30.1	49.0	52.5	60.8	65.0
4000	25.8		47.9		61.3	
5000	24.5		45.7		58.1	
6300	22.1	35.4	43.2	45.5	54.5	56.8
8000	22.0		38.9		51.8	
10000	34.9		38.3		47.2	
Overall A-weighted (dBA)	48.2		63.4		73.4	

Table 2c: Discharged Sound Power Levels of "CCC-VCD-400" Volume Control Damper

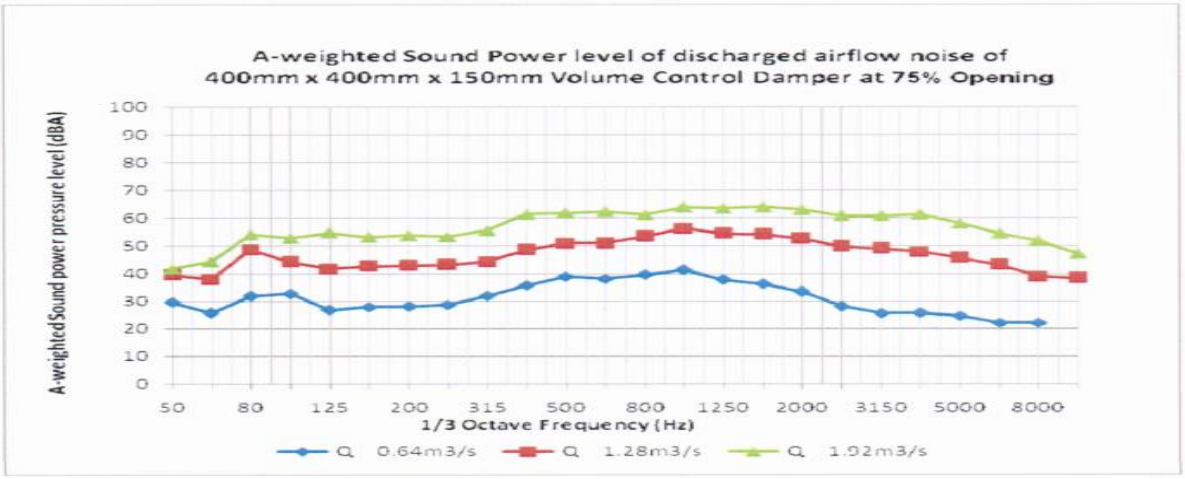

Figure 2c: Discharged Sound Power Levels of "CCC-VCD-400" Volume Control Damper at 75% opening

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CCC-VCD Performance

Frequency (Hz)	Discharged Sound Power Level (dBA) 100% Damper Opening Airflow Rate					
	Q = 0.64m³/s		Q = 1.28m³/s 3/s		Q = 1.92m³/s	
50	29.8	33.4	38.7	44.3	41.7	50.8
63	28.4		37.8		44.3	
80	27.2		41.3		48.9	
100	32.8	34.0	44.1	47.5	52.7	55.9
125	24.5		41.0		48.6	
160	25.0		42.6		51.0	
200	25.9	31.1	40.3	45.6	49.0	53.9
250	26.6		40.4		48.0	
315	26.3		41.7		50.2	
400	27.3	33.5	43.8	50.3	54.1	61.0
500	28.4		44.3		56.4	
630	30.0		47.5		57.6	
800	29.8	34.3	47.2	51.6	57.5	62.0
1000	29.4		46.7		57.3	
1250	29.5		46.7		56.9	
1600	29.0	32.4	46.0	49.9	55.8	59.8
2000	27.9		45.3		55.3	
2500	25.2		43.6		53.6	
3150	25.0	29.6	44.5	48.9	54.6	59.8
4000	25.5		44.9		55.6	
5000	23.8		42.8		54.7	
6300	21.2	35.3	38.8	42.3	50.8	53.5
8000	21.1		36.3		48.3	
10000	34.9		37.1		45.5	
Overall A-weighted (dBA)	42.3		57.5		67.6	

Table 2d: Discharged Sound Power Levels of "CCC-VCD-400" Volume Control Damper

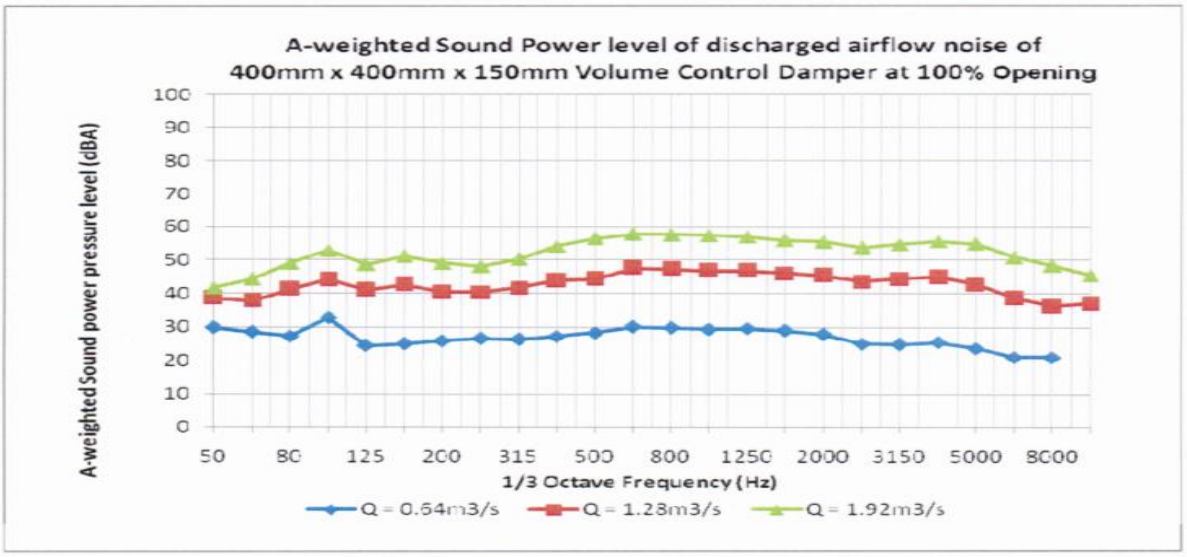

Figure 2d: Discharged Sound Power Levels of "CCC-VCD-400" Volume Control Damper at 100% opening

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CCC-VCD Performance

400mm x 400mm x 150mm Volume Control Damper (Damper blade fully Close)								
Supply Pressure (Pa)	250	300	400	500	600	800	1000	2000
Supply flow rate, Q_S (cfm)	1177	1265	1453	1592	1745	1925	2168	3070
Leakage Volume Flow Rate, Q_F (cfm)	86	134	171	208	247	265	291	313
Leakage Volume Flow Rate, Q_{FL} (l/s/m^2)	270	419	534	650	772	828	910	980
Percentage of leakage (%)	7	11	12	13	14	14	13	10
*Rated Leakage (%)	4	6	8	10	-	-	-	-

Table 3: Leakage Test of "CCC-VCD-400" Volume Control Damper

Note:

1. Nominal Flow Rate, QN = 2168 cfm
2. Percentage of Leakage (%) = (QF/QS) x 100%
3. Rate Leakage (%) = (QF/QN) x 100%. Maximum Rate Leakage = 10%

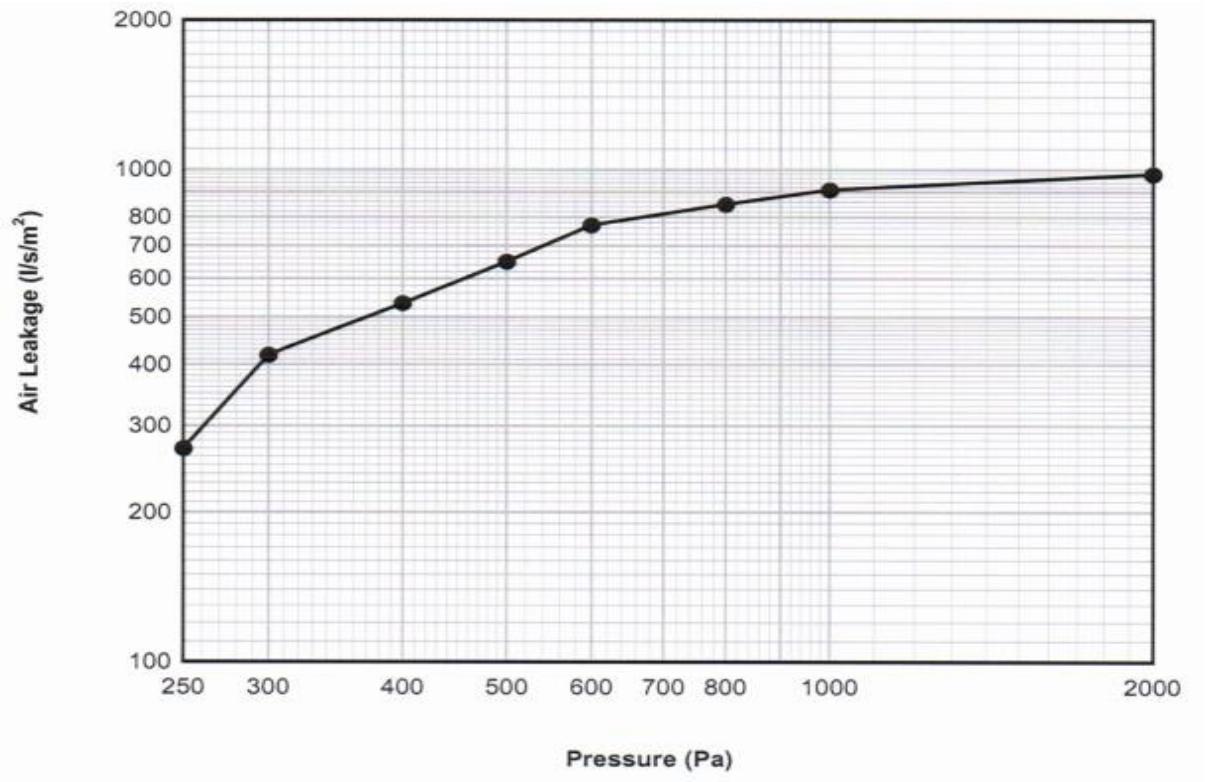

Figure 3: Leakage Test of "CCC-VCD-400" Volume Control Damper

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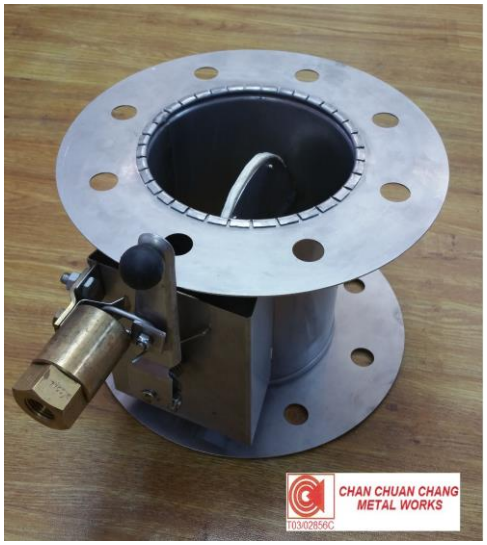
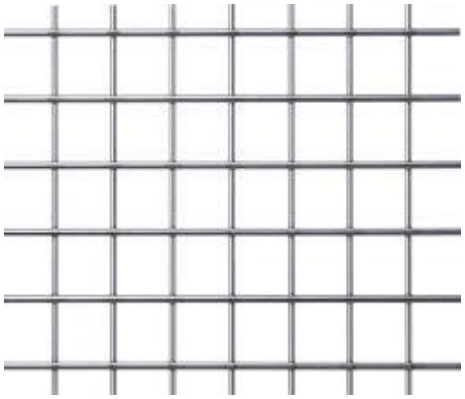
Optional Accessories/requests for Volume Control Damper



FLANGE HOLES : Pre-Flange holes allows you easier installation and acts as a guide to let you install the damper easily. Please request if you require holes at your flange so we can quote you accordingly for the number of holes.



Wire Mesh : Wires mesh is useful for Volume Control Dampers that are used outdoor to keep birds and animlas from going into your unit.

Foam Gasket : Foam gasket prevent greater leakage through the connections of VCD to ductings.

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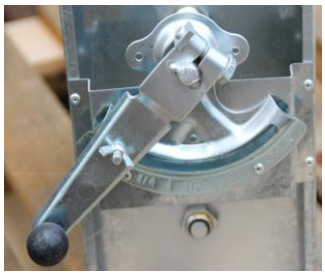
Types of Quadrant Handles for Volume Control Damper



We have many types of quadrant handles to meet your requirements for your projects. Please do indicate which type of handle you are looking for, if not by default we will just give the normal quadrant shown in the 2nd and 3rd picture depending on our stock.

All our quadrant handle serve the same purpose which is to adjust the amount of airflow for the volume control damper.

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