

02

VOLUME CONTROL DAMPER

01 02 03 04 05 06 07 08 09 10 11 12 13



@Performance

QATIF - AUJAM INDUSTRIAL
AREA DHAHRAN - JUBAIL HI WAY
P.O. BOX 10848 - QATIF 31911

القطيف - صناعية الأوجام - طريق الظهران الجبيل السريع - ص.ب ١٠٨٤٨ - القطيف ٣١٩١١

PERFORMANCE
for Metal Production
مصنع واحدة الإنجاز للصناعات المعدنية



VOLUME CONTROL DAMPER

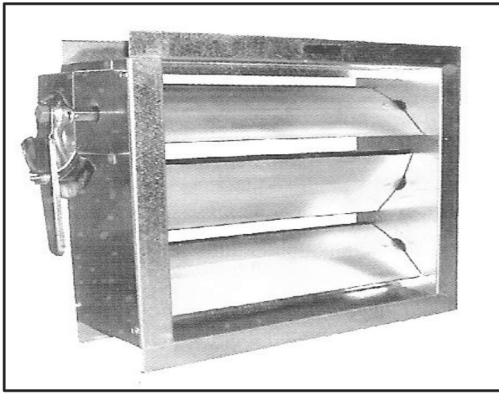
القطيف - صناعية الأوجام - طريق الظهران الجبيل السريع - ص.ب ١٠٨٤٨ - القطيف ٣١٩١١
QATIF - AUJAM INDUSTRIAL AREA DHAHRAN - JUBAIL HI WAY P.O. BOX 10848 - QATIF 31911

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VOLUME CONTROL DAMPER

volume control damper

VOLUME CONTROL DAMPER

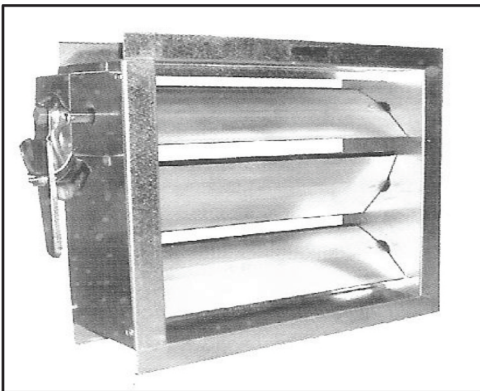


volume control damper

RECTANGULAR VOLUME CONTROL DAMPER



VCD-FC-PB



VCD-AFF-OB

Designed to be used in Ventilation Systems to Control Flow And Pressure.

Volume Control Dampers are Applicable for the Rectangular Circular and Flat Oval Ducts.

The Casing is a Rigid and Robust Assembly formed From Either Channel Frame for Flanged Connection to Duct Work, Top Hat Section for Spigot Style Connection or Top Hat Sleeve to Side in Ducting. The Blades Are Formed.

Single Skin with Grooved Blade Tips to Provide Interlocking Closure, or Airfoil Double Skin for Superior Rigidity and Deflection Resistance with Low Pressure Drop.

Blade Action is, as Standard, Parallel or Opposed (Optional).

The Dampers Can be fitted with Hand Locking Quadrant Or can be Power Operated by Electric or Pneumatic Actuators.

Volume Control Dampers Have Been Designed and Tested To Provide a Reliable Cost Effective Control.

Volume Control Dampers Have Rigid Frame and Integrally Braced Corners Providing True Damper Alignment that Greatly Resists Being Installed Indoor or Outdoor.

*** All VCDs Are Available With Actuators.**

Multi-leaf Volume Control Dampers Have Been Specifically

Materials Used for VCD:

- **Galvanized Steel: (Standard)** Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel: (Optional)** Complying with ASTM A240M / A480M, Grade 304, 304L, 316, & 316L.

volume control damper

Rectangular Volume Control Damper

VCD – FLANGE TYPE PARELLE BLADES

TYPE: Flange Case (**VCD-CF-PB**) is Fabricated Of One Piece Roll-Formed Channel is to be installed Between Two Pieces of Ducts by Flanges.

RATINGS:

Pressure: - Up to 4" w.g. (Up to 1000 Pa)

Velocity: - Up to 3000 fpm (Up to 15.2 m/s)

FEATURES:

Casing: - 16 Gage Galvanized Steel.

Blades: - Triple-vee Profile 16 Gage Galvanized Steel.

Linkage: - 14 Gage Galvanized Steel.

Axles: - Zinc Plated Square Mild Steel, 12x12mm.

Bearings: - Synthetic Sleeve Type.

Quadrant: - Galvanized Hand Locking Quadrant.

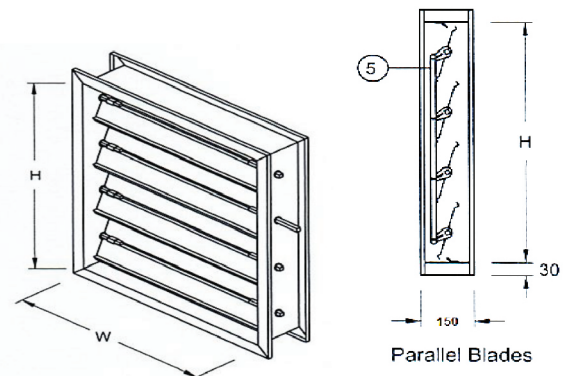
Minimum / Maximum Sizes:

- 150x150mm Minimum Size

- 1200x1800mm Maximum Size

HEIGHT (MM)	NUMBER OF BLADES	Position of Drive Arm X (mm)
150	1	50
200	1	75
250	1	100
300	2	125
350	2	150
400	2	240
450	3	275
500	3	300
600	4	240
700	4	300
800	4	425
900	5	400
1000	6	450
1100	7	575
1200	9	540
1300	7	600
1400	7	750
1500	9	600
1600	9	750
1700	10	875
1800	10	840

* All VCDs Are Available With Actuators.



Materials Used for VCD:

- **Galvanized Steel: (Standard)** Complying with ASTM A653 and Having G90 Coating Designation.

- **Stainless Steel: (Optional)** Complying with ASTM A240M / A480M, Grade 304, 304L, 316, & 316L.

volume control damper

Rectangular Volume Control Damper

VCD – AIRFOIL BLADES

TYPE: Flange Case (VCD-AOB) is Fabricated

Of One Piece Roll-Formed Channel.

Is to be installed between Two Pieces of Ducts by Flanges.

RATINGS:

Pressure: Up to 4" w.g. (Up to 1000 Pa)

Velocity: Up to 3000 fpm (Up to 15.2 m/s)

FEATURES:

Casing: -16 Gage Galvanized Steel.

Blades: - Airfoil Double Skin 22 Gage Galvanized Steel & Aluminum profile

Linkage: -14 Gage Galvanized Steel .

Axles: - Zinc Plated Square Mild Steel, 12 x12 mm.

Bearings: - Synthetic Sleeve Type.

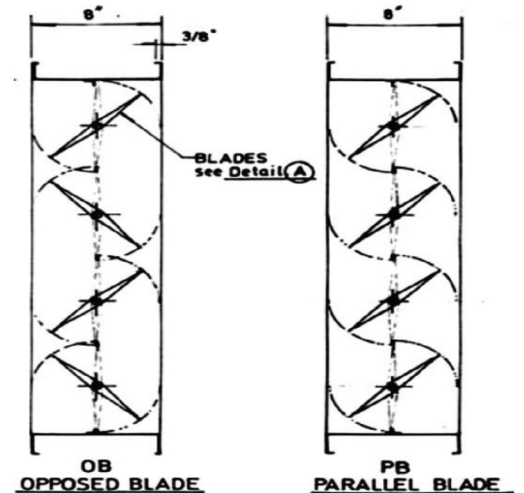
Quadrant: - Galvanized Hand Locking Quadrant.

Minimum / Maximum Sizes:

- 150x150mm Minimum Size

- 1200x1800mm Maximum Size

HEIGHT (MM)	NUMBER OF BLADES	Position of Drive Arm X (mm)
150	1	50
200	1	75
250	2	100
300	3	125
350	3	150
400	4	240
450	4	275
500	5	300
600	6	240
700	7	300
800	8	425
900	9	400
1000	10	450
1100	11	575
1200	12	540
1300	13	600
1400	14	750
1500	15	600
1600	16	750
1700	17	875
1800	18	840



* All VCDs Are Available With Actuators.

Materials Used for VCD:

- **Galvanized Steel: (Standard)** Complying with ASTM A653 and Having G90 Coating Designation.

- **Stainless Steel: (Optional)** Complying with ASTM A240M / A480M, Grade 304, 304L, 316, & 316L.

volume control damper

Rectangular Volume Control Damper

TYPE: Sleeve Case (**VCD-SC**) is Fabricated Of One Piece Roll-Formed Hat Channel.

Installation shall be Easy and Inside the Ducts

RATINGS:

- **Pressure:** Up to 4" w.g. (Up to 1000 Pa)

- **Velocity:** Up to 3000 fpm (Up to 15.2 m/s)

FEATURES:

Casing: - 20 Gage Galvanized Steel

Blades: - Triple-vee Profile 16 Gage Gal. Steel.

Linkage: - 14 Gage Galvanized Steel

Axles: - Zinc Plated Square Mild Steel, 12 x12mm.

Bearings: - Synthetic (Sleeve Type)

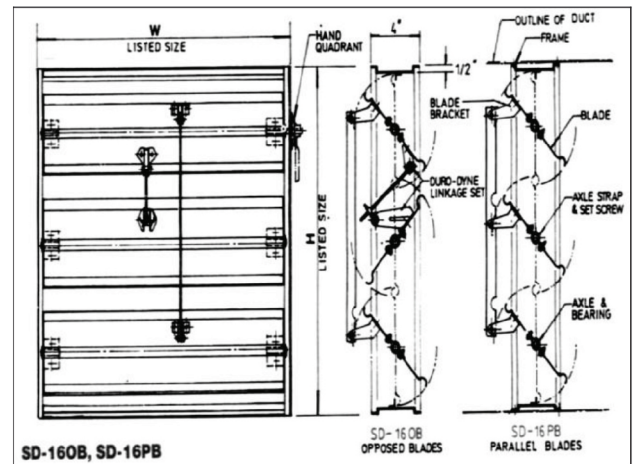
Quadrant: - Galvanized Hand Locking Quadrant.

Minimum / Maximum Sizes:

- 150x150mm Minimum Size

- 1200x1800mm Maximum Size

HEIGHT (MM)	NUMBER OF BLADES	Position of Drive Arm X (mm)
150	1	50
200	1	75
250	1	100
300	2	125
350	2	150
400	2	240
450	3	275
500	3	300
600	4	240
700	4	300
800	4	425
900	5	400
1000	6	450
1100	7	575
1200	9	540
1300	7	600
1400	7	750
1500	9	600
1600	9	750
1700	10	875
1800	10	840



* All VCDs Are Available With Actuators.

Materials Used for VCD:

- **Galvanized Steel: (Standard)** Complying with ASTM A653 and Having G90 Coating Designation.

- **Stainless Steel: (Optional)** Complying with ASTM A240M / A480M, Grade 304, 304L, 316, & 316L.

volume control damper

Flat Oval Volume Control Damper

TYPE: Flat Oval Spigot Case (**VCD-FOC**) is Fabricated of Double Skin Steel (Internal Liner is Optional).
is to be Installed Between Two Pieces of Flat Oval Ducts.

RATINGS:

- Pressure: Up to 3'w.g. (Up to 750 Pa)
- Velocity: Up to 2000 fpm (Up to 10.2 m/s)

FEATURES:

Casing: - Inner: 20 Gage Galvanized Steel
- Outer 20 Gage Galvanized Steel

Blades: - Triple-vee Profile 18-16 Gage Galvanized Steel.

Axles : - Zinc Plated Square Mild Steel, 12x12mm.

Linkage:- 14 Gage Galvanized Steel.

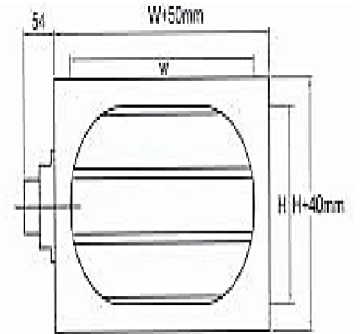
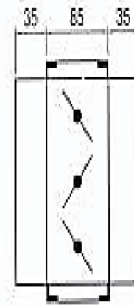
Bearings: - Synthetic (acetal) Sleeve Type.

Quadrant: - Galvanized Hand Locking Quadrant.

Minimum / Maximum Sizes:

- 150x150mm Minimum Size
- 1200x1200mm Maximum Size

HEIGHT (MM)	NUMBER OF BLADES	Position of Drive Arm X (mm)
150	1	50
200	2	75
250	2	100
300	3	125
350	3	150
400	4	240
450	4	275
500	5	300
600	6	240
700	7	300
800	8	425
900	9	400
1000	10	450
1100	11	575
1200	12	540



Materials Used for VCD:

- **Galvanized Steel: (Standard)** Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel: (Optional)** Complying with ASTM A240M / A480M, Grade 304, 304L, 316, & 316L.

volume control damper

CIRCULAR Volume Control Damper

TYPE: CIRCULAR Spigot Case (**VCD-CSC**) is Fabricated of Double Skin Steel (Internal Liner is Optional). is to be Installed Between Two Pieces of Flat Oval Ducts.

RATINGS:

- Pressure: Up to 3'w.g. (Up to 750 Pa)
- Velocity: Up to 2000 fpm (Up to 10.2 m/s)

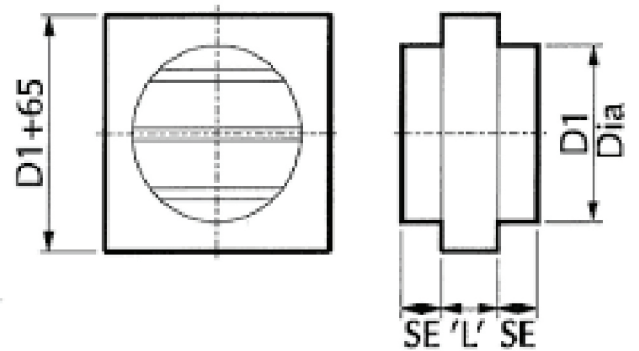
FEATURES:

- Casing:** - Inner: 20 Gage Galvanized Steel
- Outer 20 Gage Galvanized Steel
- Blades:** - Triple-vee Profile 18-16 Gage Galvanized Steel.
- Axles:** - Zinc Plated Square Mild Steel, 12x12mm.
- Linkage:** - 14 Gage Galvanized Steel.
- Bearings:** - Synthetic Sleeve Type.
- Quadrant:** - Galvanized Hand Locking Quadrant.

Minimum / Maximum Sizes:

- 150x150mm Minimum Size
- 1200x1200mm Maximum Size

HEIGHT (MM)	NUMBER OF BLADES	Position of Drive Arm X (mm)
150	1	50
200	2	75
250	2	100
300	3	125
350	3	150
400	4	240
450	4	275
500	5	300
600	6	240
700	7	300
800	8	425
900	9	400
1000	10	450
1100	11	575
1200	12	540



* All VCDs Are Available With Actuators

Materials Used for VCD:

- **Galvanized Steel: (Standard)** Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel: (Optional)** Complying with ASTM A240M / A480M, Grade 304, 304L, 316, & 316L.

volume control damper

ROUND Volume Control Damper

TYPE: ROUND (**RVCD-S**) is Fabricated of Steel.

VCD-R shall be installed between Two Pieces of round Ducts or Plenum Box.

VCD with Nominal Sizes of 100 to 450mm are round Control Dampers to Adjust

Air Volume Flow Rates in Air Conditioning and Ventilation Systems.

RATINGS:

Pressure: - Up to 2'w.g. (Up to 500 Pa)

Velocity: - Up to 2000 fpm (Up to 10.2 m/s)

FEATURES:

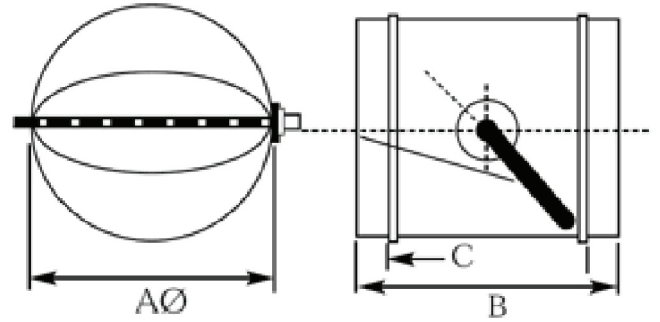
Casing & Blade: - 20 Gage Galvanized Steel

Axles: - Zinc Plated Square Mild Steel.

Bearings: - Synthetic Sleeve Type.

Quadrant: - Galvanized Hand Locking Quadrant.

SIZE MM	LENGTH MM	Casing Thickness MM	Blade Thickness MM	Axle & Bearing MM
100	170	0.8	1.00	6X6
125	170	0.8	1.00	6X6
150	170	0.8	1.00	6X6
200	225	1.00	1.20	8X8
250	270	1.00	1.20	8X8
300	350	1.00	1.20	10X10
350	400	1.20	1.50	10X10
400	450	1.20	1.50	10X10
450	500	1.20	1.50	10X10



* All VCDs Are Available With Actuators.

Materials Used for VCD:

- **Galvanized Steel: (Standard)** Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel: (Optional)** Complying with ASTM A240M / A480M, Grade 304, 304L, 316, & 316L.

volume control damper

AIR CONTROL DAMPER MODEL KACLO10 or 20

AIR CONTROL DAMPER

STANDARD CONSTRUCTION

FRAME:

16 Ga galvanized steel interlocking hat channel frame construction.

22Ga galvanized steel Flat type frame.

BLADES:

16 Ga galvanized steel (20Ga for Flat) 3V type blades
Parallel blades model KACLO10

Opposed blades model KACLO20

BEARINGS:

Nylon bearings

AXLES:

0.47"(12mm) Square zinc plated steel stud

LINKAGE:

Concealed in frame 10Ga (3mm) zinc plated steel

MANUAL HAND-QUADRANT:

Galvanized steel die cast hand-quadrant plated for square or round shaft installed on an elevated bearing bracket

BRACKET:

1" (25mm) elevated hand bracket

FINISH:

Mill galvanized



OPTIONS:

1) Rubber foam blade seals. (-BS)

2) BEARINGS:

Bronze bearings (std for motorized dampers)
or stainless steel bearings.

3) FRAME CONSTRUCTION

a) Aluminum or stainless steel frame construction.

b) Various Frame Thickness (Refer to order information)

4) BLADES CONSTRUCTION

a) Aluminum or stainless steel frame construction.

b) Various Blades Thickness (Refer to order information)

5) ACTUATORS:

a) Electric (24, 120 & 230V) or pneumatic.

b) Spring return or non spring return.

c) With or without auxiliary switch.

6) Blades indicator switch - BIS

7) a) FLANGES FOR HAT TYPE FRAME:

Standard duct flanges 35mm (with 1.5mm thickness for damper
without sleeve or same as sleeve thickness)
or duct matc flanges 35mm

7) b) FLANGES FOR FLAT TYPE FRAME:

Standard duct flanges 20mm (with thickness same as flat type
frame thickness)
or duct matc flanges 35mm

8) SLEEVES (Not applicable on Flat type):

Refer to the air control damper sleeve catalogue
for standard type of sleeve

9) EXTENDED SHAFT (without Hand Qaudrant):

4.7" (120mm) extended shaft (round or square) beyond the air
control frame.

10) 2" Elevated hand bracket.

11) Extended frame depth for Flat Type

APPLICATION

KACLO volume dampers series are designed to provide superior air control with high performance and heavy duty construction. KACLO10 or 20 Dampers are specifically designed for manual balancing applications. They are suitable for use in the majority of commercial medium to high pressure and velocity HVAC systems.

They are designed and built to provide cost effective and reliable dampers for reduced volume control and nonpositive shut-off.

MINIMUM SIZES:

a) SINGLE BLADE FLAT TYPE :

4"W(101mm) x 4"H(101mm).

b) SINGLE BLADE HAT TYPE:

14"W(355mm) x 6"H(152mm) & 12"W(305mm) x 8"H(203mm) &
6"W(152mm) x 10"H(254mm)

c) MULTI-BLADES :

6"W(152mm) x 14"H(355mm) & 19"W(482mm) x 12"H(305mm)

Notes: Dampers with width 4" & 5" are only available up to 8" height

MAXIMUM SIZES:

a) SINGLE BLADE FLAT TYPE:

10"W(254mm) x 8"H(203mm) & 12"W(305mm) x 6"H(152mm)
& 48"W(1219mm) x 5"H(127mm)

b) SINGLE BLADE HAT TYPE:

48"W(1219mm) x 10"H(254mm) & 18"W(457mm) x 12"H(305mm)

c) MULTI-BLADES SINGLE SECTION:

48"W(1219mm)x 48"H(1219mm)

MULTI-SECTIONS: UNLIMITED

For hat type : dampers are supplied 1/4" less than order WIDTH &
HEIGHT unless specified "ACTUAL SIZE"

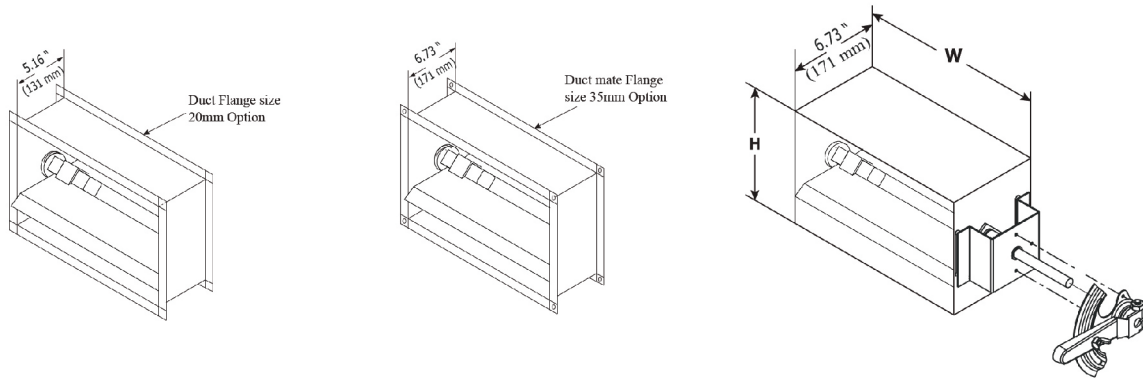
For flat type: dampers are supplied with "ACTUAL SIZE"

volume control damper

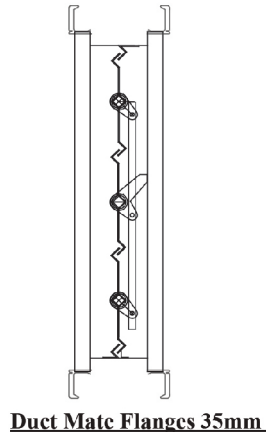
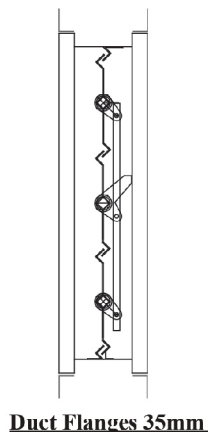
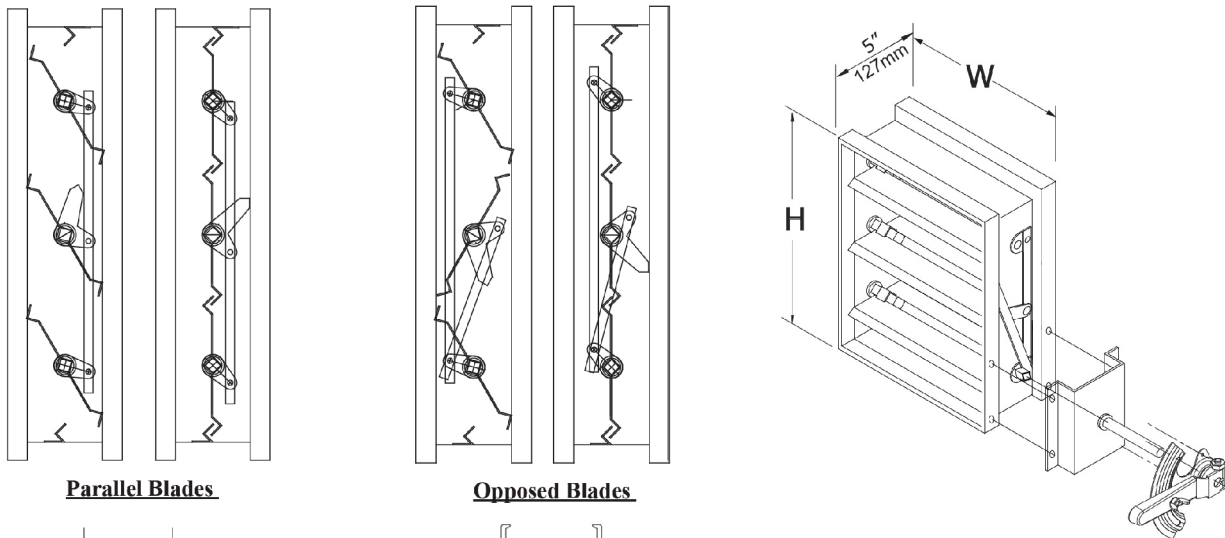
AIR CONTROL DAMPER

MODEL KACLO10, 20, 11 & 21 DETAILS

FLAT TYPE



HAT TYPE



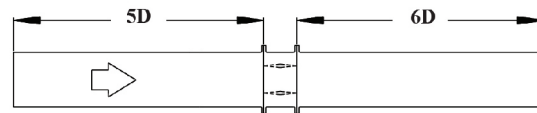
volume control damper AIR CONTROL DAMPER

MODEL KACLO10, 20, 11 & 21

PERFORMANCE DATA

AMCA Test Figures

Figure 5.3 Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.



Damper in Fully open position

48"x12" (1219x305mm)

Velocity (Fpm)	Pressure Drop (In. Wg)
500	0.02
1000	0.10
1500	0.22
2000	0.42
3000	1.05

12"x48" (305x1219mm)

Velocity (Fpm)	Pressure Drop (In. Wg)
500	0.01
1000	0.05
1500	0.10
2000	0.19
3000	0.42

12"x12" (305x305mm)

Velocity (Fpm)	Pressure Drop (In. Wg)
1000	0.11
1500	0.26
2000	0.46
2500	0.74
3000	1.07

24"x24" (610x610mm)

Velocity (Fpm)	Pressure Drop (In. Wg)
800	0.03
1000	0.05
1500	0.10
2000	0.18
3000	0.41

36"x36" (914x914mm)

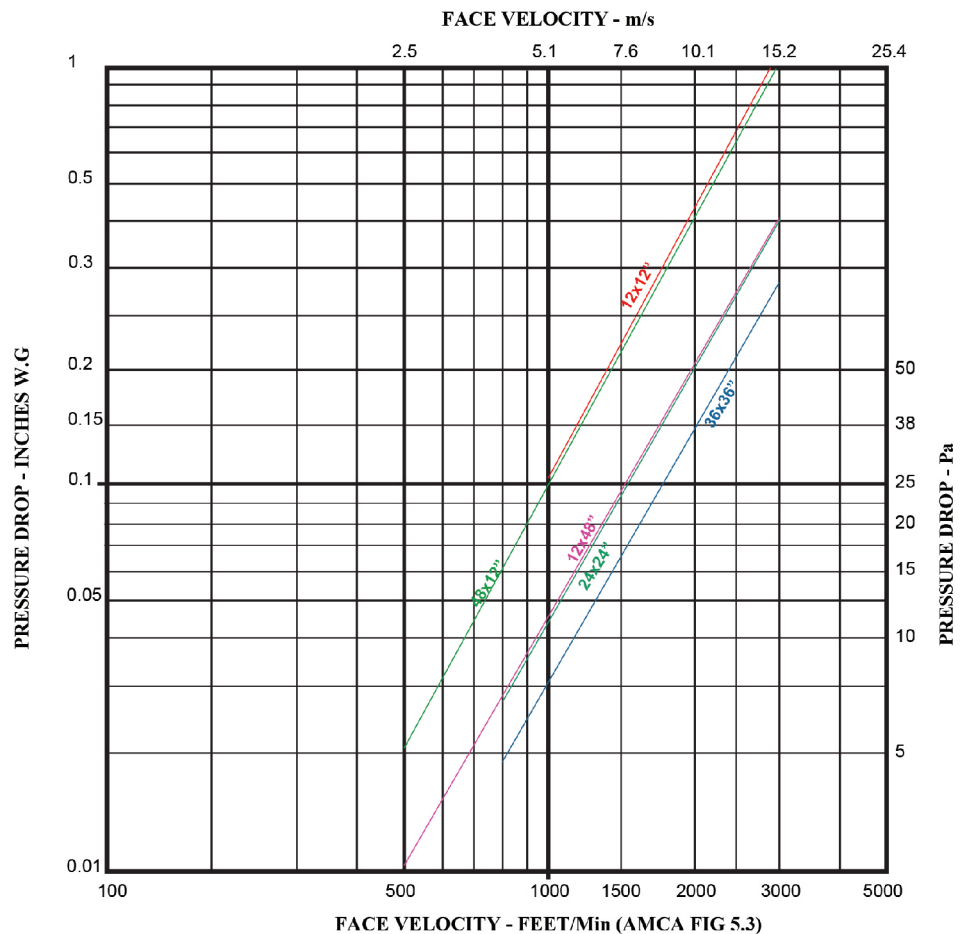
Velocity (Fpm)	Pressure Drop (In. Wg)
800	0.02
1000	0.03
1500	0.07
2000	0.12
3000	0.28

Tested for Air Performance in accordance with ANSI/AMCA Standard 500-D, Figure 5.3.

Air performance testing was conducted using opposed blade dampers; the same results can be applied to parallel blade dampers. All data has been corrected to represent standard air density .075 lb/ft



KBE International certifies that the model KACLO shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to Air Performance ratings.



volume control damper

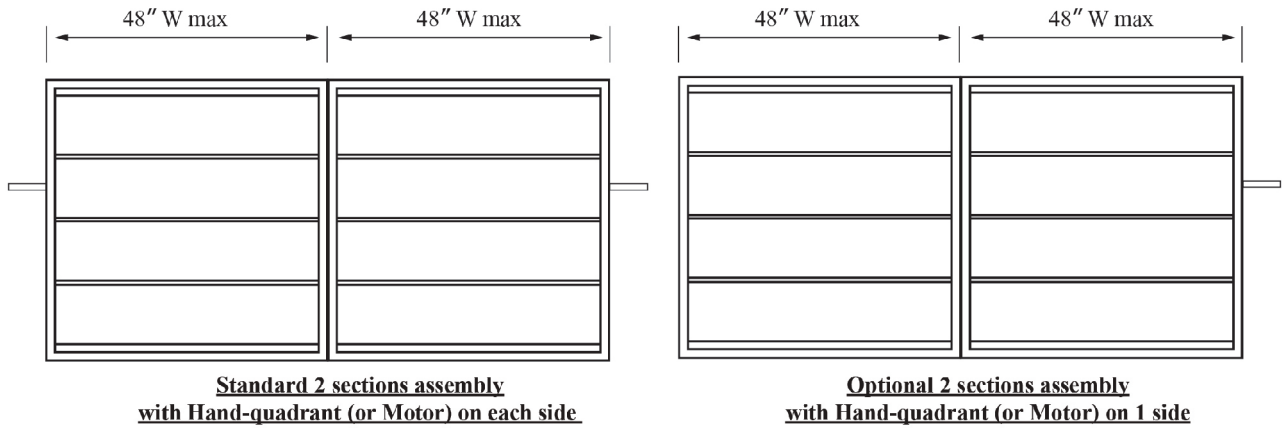
AIR CONTROL DAMPER

MODEL KACLO10, 20, 11 & 21 DETAILS

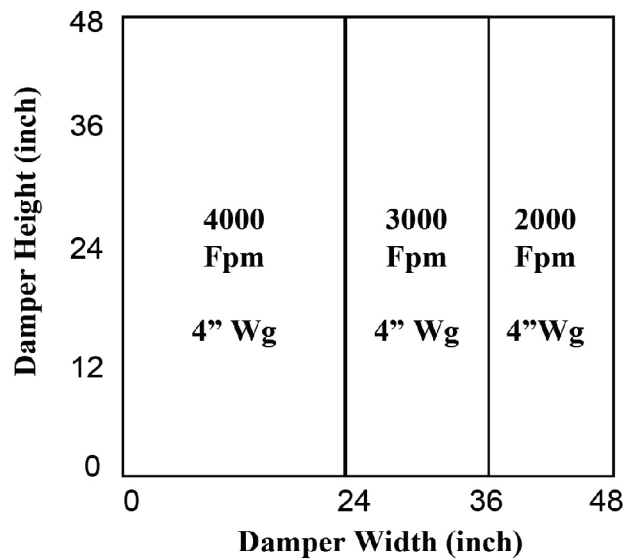
Multi-Section Assembly

Dampers larger than maximum single section size, will be made up of multiple equal sections. Sections to be assembled on site (as standard) by sheet metal screw or #10 bolts & nuts with hand-quadrant on each side of the damper.

Damper can be factory assembled with single side hand-quadrant as optional with limited assembly of 2 sections --limitation is required to avoid damage during transportation-- unless assembled with factory mounted sleeve.



Velocity & Pressure Limitations



volume control damper

- All incoming materials from the suppliers are checked for appropriate certificates and documents.
- Random Samples collected from the raw materials are subject for inspection as per the Specifications.
- The process operator inspection is done by inspecting the first piece and scheduled inspection by equal intervals.
- The QC visual & technical Inspections are carried out on appropriate areas and the non – confirming goods if any are kept aside and sent for replacement.
- The QA/QC In-charge inspects the production line on a random basis in equal intervals to assess the quality of the finish, defects and appropriate standard compliances.
- The final finished product inspected is carried out on the entire production line before handing over to stores/dispatch.

FABRICATION PROCEDURE:

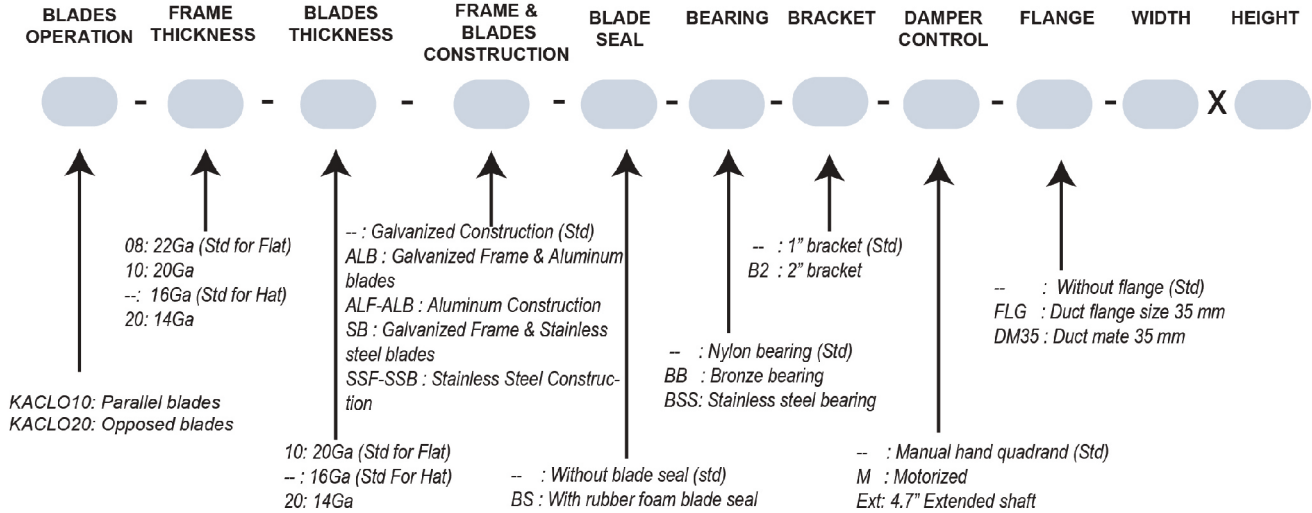
- 1) Client/contractor has to provide approved drawing issued for construction (AUTO-CADD copy shall be provided)
- 2) Material take off for each drawing well be provided to the client/Contractor.
- 3) Tagged drawing will be provided to the client / contactor for approval.
- 4) Accurate take off to be issued by our staff as per approved tagged drawing.
- 5) All Duct Works are fabricated according to SMACNA, DW144 & ASHRAE Unless Specified else.
- 6) Each item must be numbered on the drawings and labeled on the fabric
- 7) Quality assurance and quality control to be made for each item before collection.

volume control damper

AIR CONTROL DAMPER

MODEL KACLO10 or 20

ORDERING INFORMATION



Example: KACLO20-BB-M-24x24 -- Motorized damper 24x24 Hat type 16ga galvanized construction with bronze bearing.
KACLO10-08-10--8x8 - Manual damper 8x8 Flat type with 22ga galvanized frame & 20ga galvanized blade

ACTUATOR SELECTION:

Please select the specifications needed for the actuator:

Electric	☐	Pneumatic	☐
24 VAC	☐	230VAC	☐
Spring return	☐	Non spring return	☐
On/Off	☐	Modulating	☐
With auxiliary switch	☐	Without auxiliary switch	☐

Note:

Volume Dampers with width or height that exceed 48" (1200mm) are manufactured as multiple section and field assembled by others.

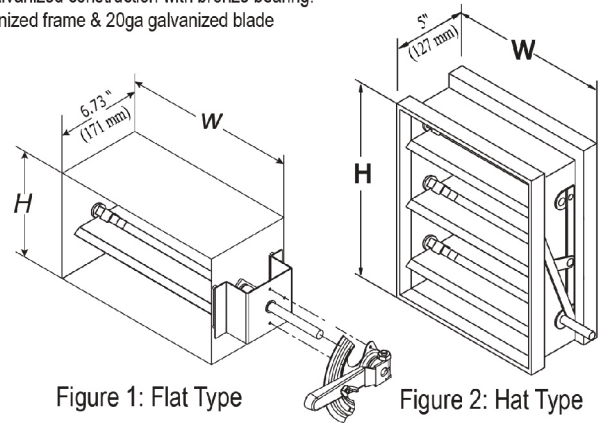
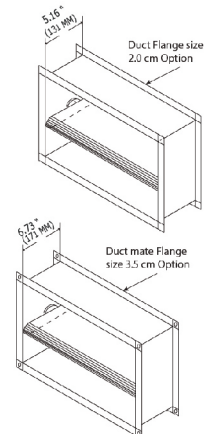


Figure 1: Flat Type

Figure 2: Hat Type

	4	5	6	8	10	12	14	16	18	...	46	48
4	Single Blade Flat Type											
5												
6												
8												
10	Single Blade Hat Type											
12												
14	Multi Blade Hat Type											
...												
46												
48												





VOLUME CONTROL DAMPER



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