



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) BEARINGS:

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

2) FRAME CONSTRUCTION

- a) Aluminum or stainless steel frame construction.
- b) Various Frame Thickness (Refer to order information)

3) BLADES CONSTRUCTION

- a) Aluminum or stainless steel frame construction.
- b) Various Blades Thickness (Refer to order information)

4) ACTUATORS:

- a) Electric (24,120 & 230V) or pneumatic.
- b) Spring return or non spring return.
- c) With or without auxiliary switch.

5) Blades indicator switch - BIS

6) FLANGES:

Various Sizes & Thicknesses (Refer to order information)

- a) Damper W/O sleeve: Flange and Frame have equal thickness
- b) Damper W/ sleeve: Flange and Sleeve have equal thickness

7) Single edge Rubber foam blade seals. (-BS)

8) SLEEVES (Not applicable on Flat type):

- a) Refer to the air control damper sleeve catalogue for standard type of sleeve
- b) Double skin

9) EXTENDED SHAFT (without Hand Quadrant):

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)

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"



AIR CONTROL DAMPER MODEL KACLO11 or 21

LOW LEAK 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 KACLO11

Opposed blades model KACLO21

SEALS:

Stainless Steel Jamb Seal

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) BEARINGS:

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

2) FRAME CONSTRUCTION

a) Aluminum or stainless steel frame construction.

b) Various Frame Thickness (Refer to Order Information)

3) BLADES CONSTRUCTION

a) Aluminum or stainless steel frame construction.

b) Various Blades Thickness (Refer to Order Information)

4) ACTUATORS:

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

b) Spring return or non spring return.

c) With or without auxiliary switch.

5) Blades indicator switch - BIS

6) FLANGES:

Various Sizes & Thicknesses (Refer to Order information)

a) Damper W/O sleeve: Flange and Frame have equal thickness

b) Damper W/ sleeve: Flange and Sleeve have equal thickness

7) Single edge rubber foam blade seals. (BS)

8) SLEEVES (Not applicable on Flat type):

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

b) Double skin

9) EXTENDED SHAFT (without Hand Quadrant):

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. KACLO11 or 21 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)

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"

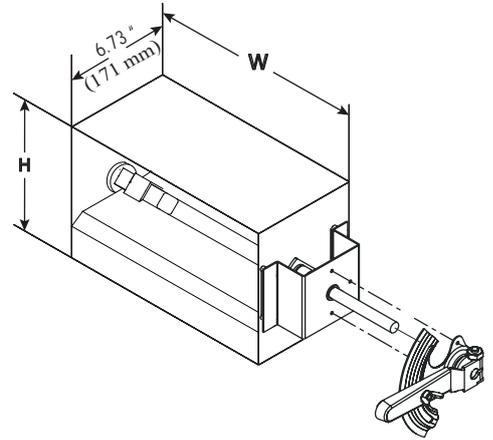
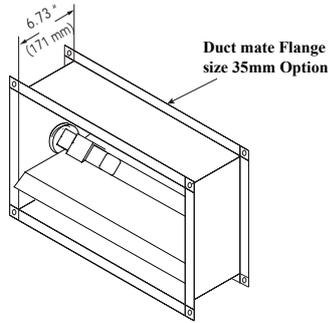
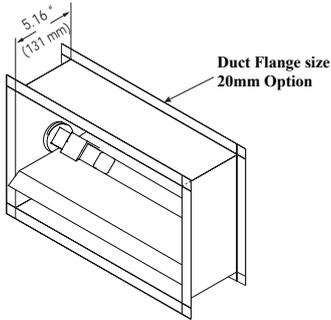
For flat type: dampers are supplied with "ACTUAL SIZE"

AIR CONTROL DAMPER

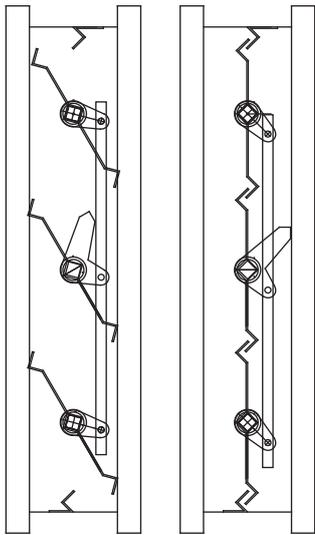
MODEL KACLO10, 20, 11 & 21

DETAILS

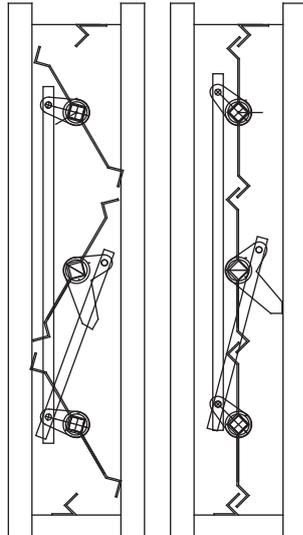
FLAT TYPE



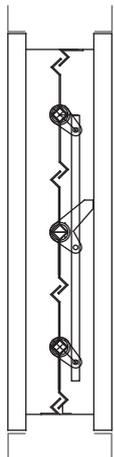
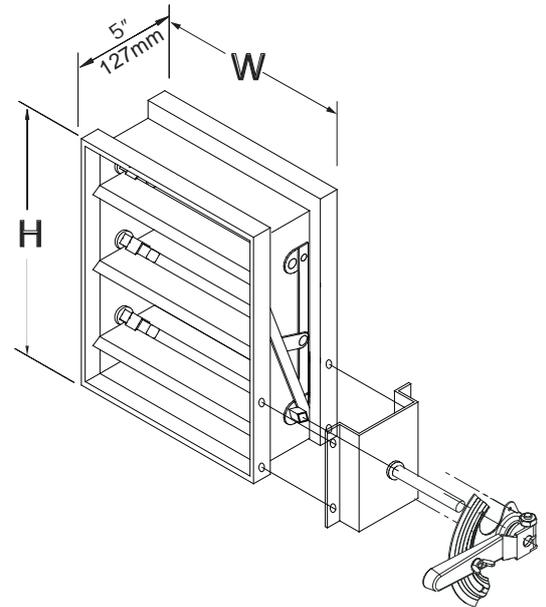
HAT TYPE



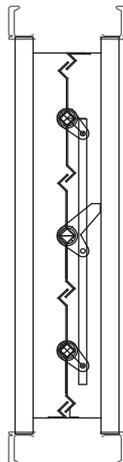
Parallel Blades



Opposed Blades



Duct Flanges 35mm



Duct Mate Flanges 35mm



Motorized Damper



AIR CONTROL DAMPER

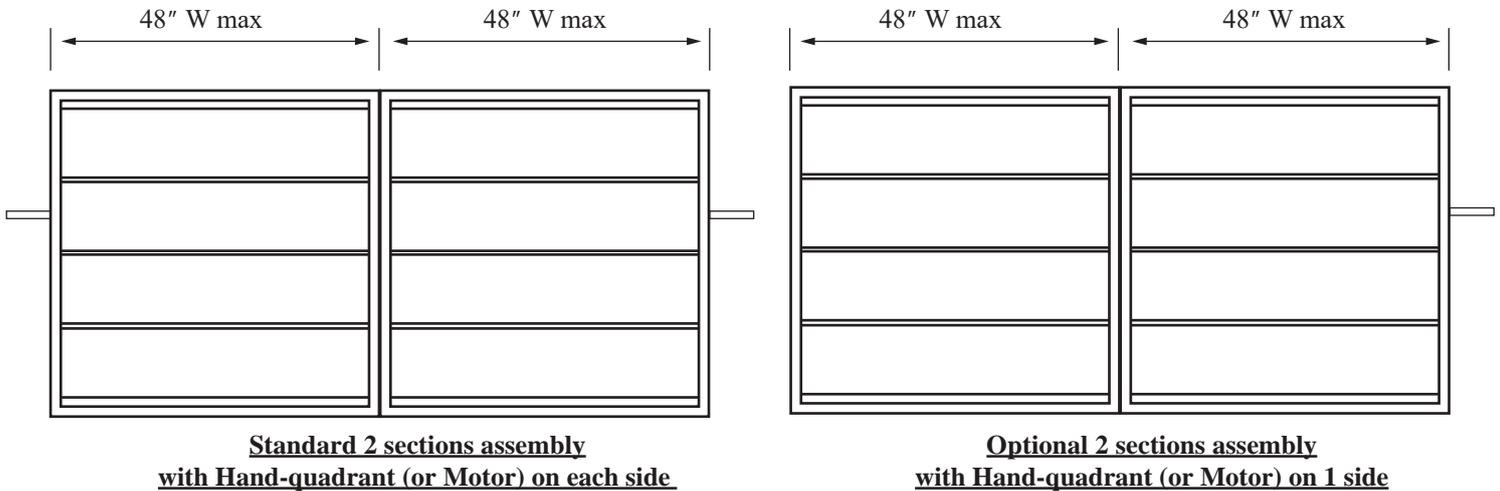
MODEL KACLO10, 20, 11 & 21

DETAILS

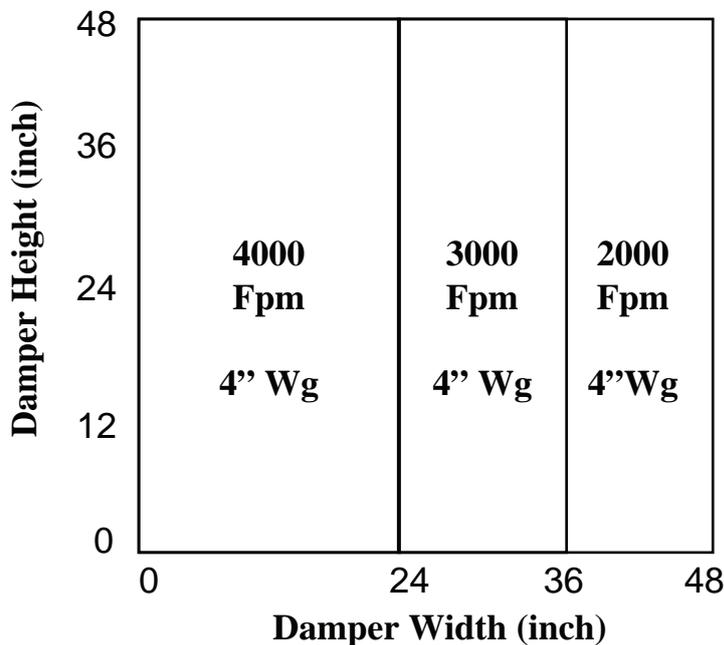
Multi-Section Assembly

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





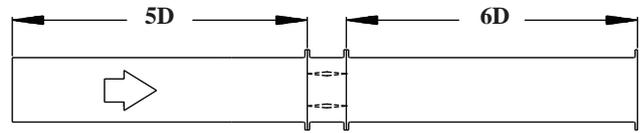
AIR CONTROL DAMPER

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

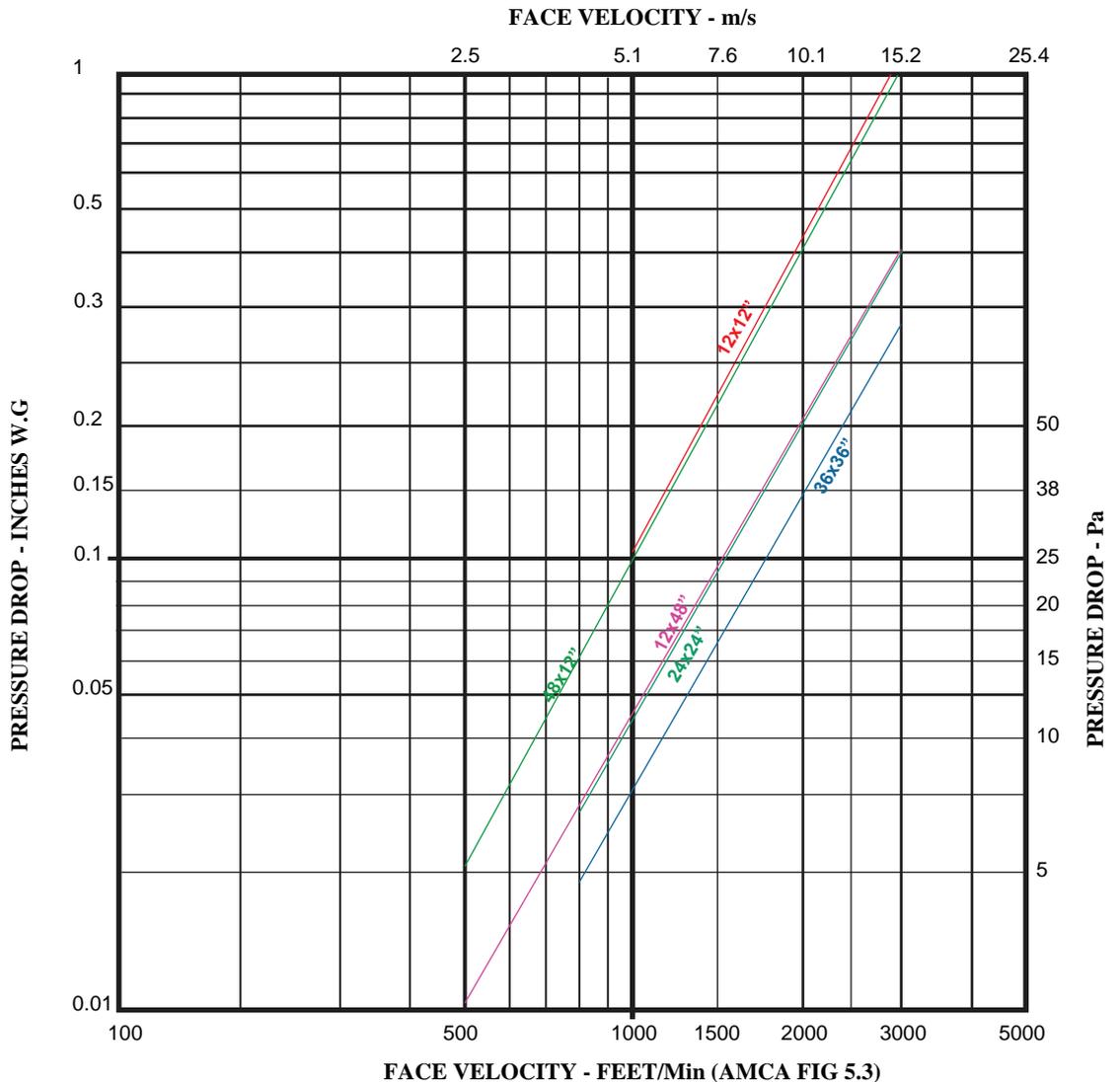
36"x36" (914x914mm)

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

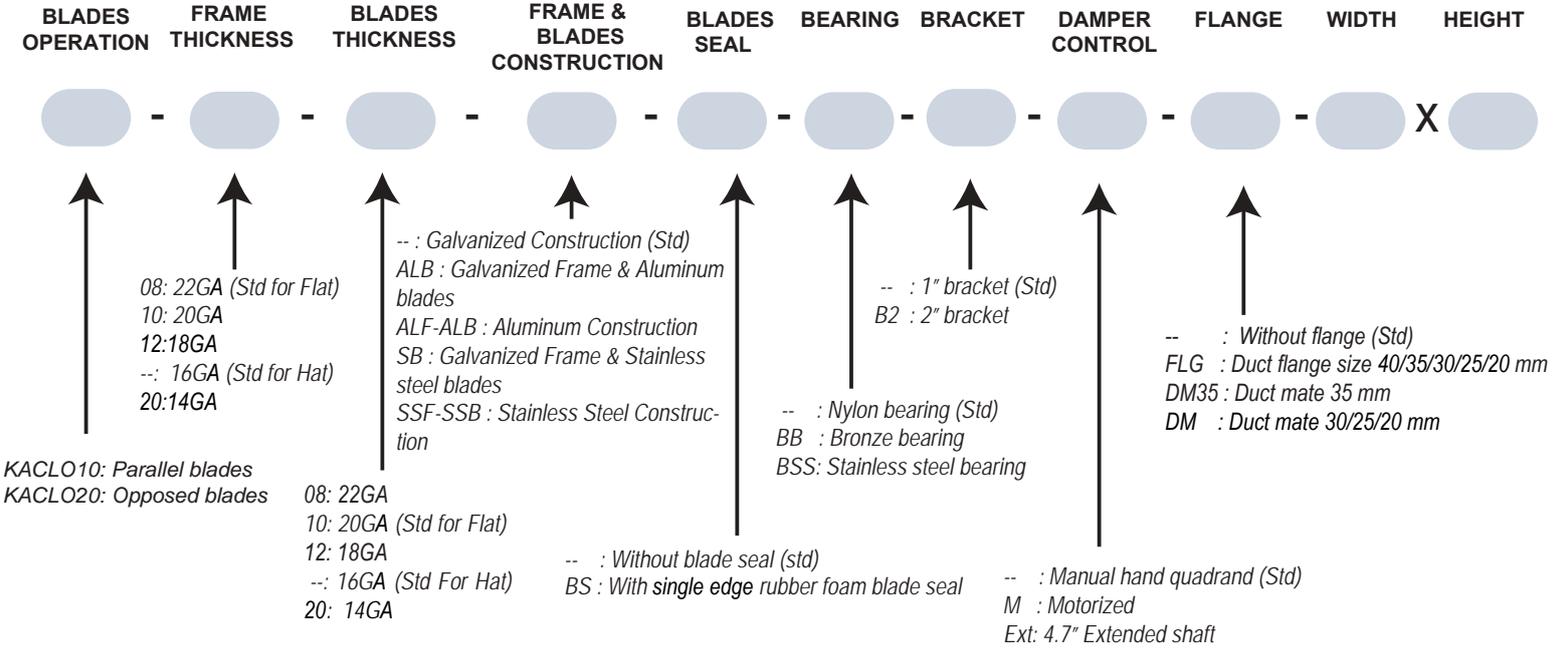


KBE International certifies that the model KACLO shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal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





AIR CONTROL DAMPER MODEL KACLO10 or 20 ORDERING INFORMATION

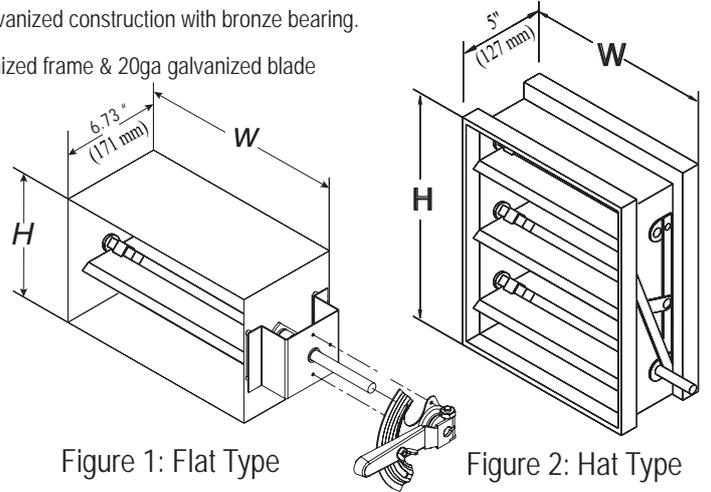


Example: KACLO20-BB-M-24x24 -- Motorized damper 24x24 Hat type 16ga galvanized construction with bronze bearing.
 KACLO10-08-10--8x8 - Manual damper 8x8 Flat type with 22ga galvanized frame & 20ga galvanized blade

ACTUATOR SELECTION:

Please select the specifications needed for the actuator:

Electric	<input type="checkbox"/>	Pneumatic	<input type="checkbox"/>
24 VAC	<input type="checkbox"/>	230VAC	<input type="checkbox"/>
Spring return	<input type="checkbox"/>	Non spring return	<input type="checkbox"/>
On/Off	<input type="checkbox"/>	Modulating	<input type="checkbox"/>
With auxiliary switch	<input type="checkbox"/>	Without auxiliary switch	<input type="checkbox"/>

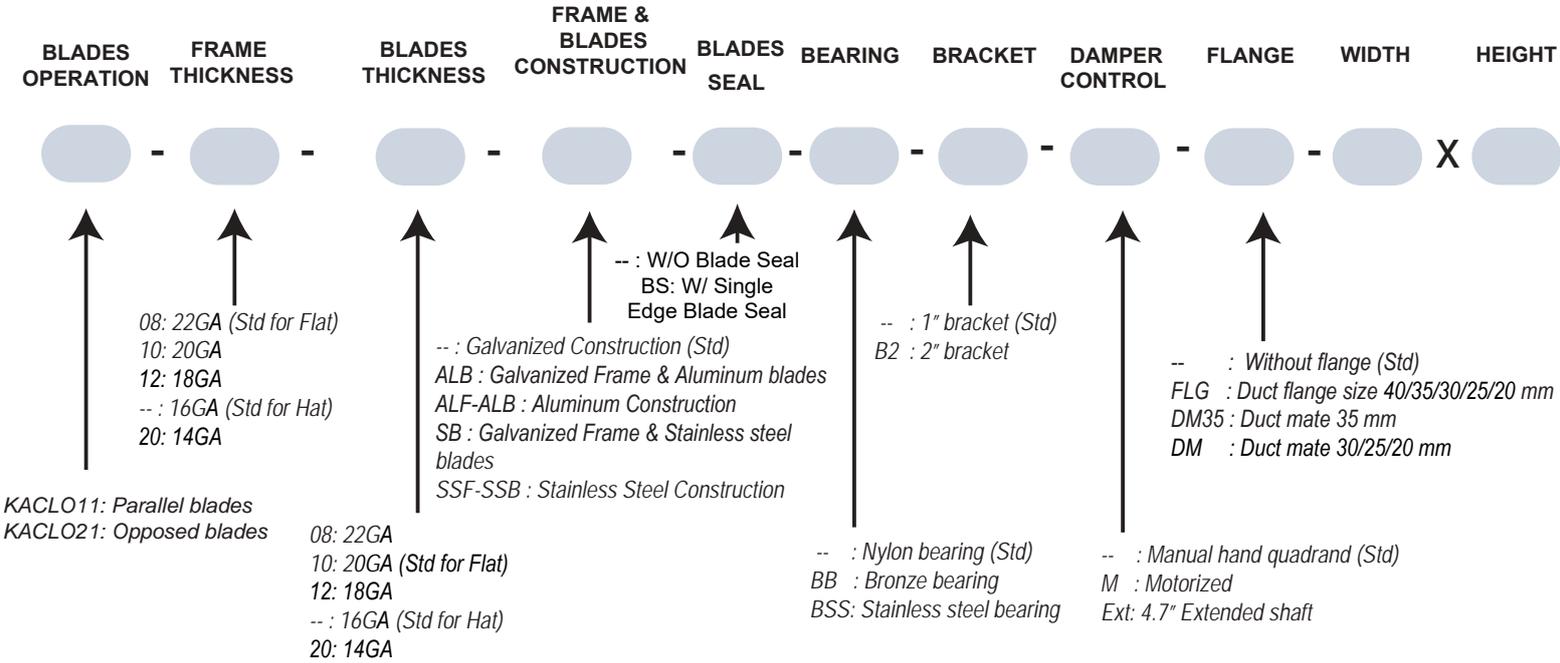


Note:
 Volume Dampers with width or height that exceed 48" (1200mm) are manufactured as multiple section and field assembled by others.

SIZE LIMITATION / THICKNESS:	4	5	6	8	10	12	14	16	18	...	46	48
UP TO 24" x 24" 0.8mm Frame 0.8mm Blade	Single Blade Flat Type											
UP TO 36" x 36" 0.8mm Frame 1.0mm Blade												
UP TO 48" x 48" 1.0mm Frame 1.2mm Blade	N/A	Multi Blade Hat Type										



AIR CONTROL DAMPER MODEL KACLO11 or 21 ORDERING INFORMATION



Example: KACLO21-BB-M-FLG-24x24 -- Motorized damper 24x24 Hat type with bronze bearing & duct flangesize 35mm
KACLO11-0810-SB--6x6 - Manual damper 6x6 Flat type with 22ga galvanized frame & 20ga Stainless Steel blade

ACTUATOR SELECTION:

Please select the specifications needed for the actuator:

Electric	<input type="checkbox"/>	Pneumatic	<input type="checkbox"/>
24 VAC	<input type="checkbox"/>	230VAC	<input type="checkbox"/>
Spring return	<input type="checkbox"/>	Non spring return	<input type="checkbox"/>
On/Off	<input type="checkbox"/>	Modulating	<input type="checkbox"/>
With auxiliary switch	<input type="checkbox"/>	Without auxiliary switch	<input type="checkbox"/>

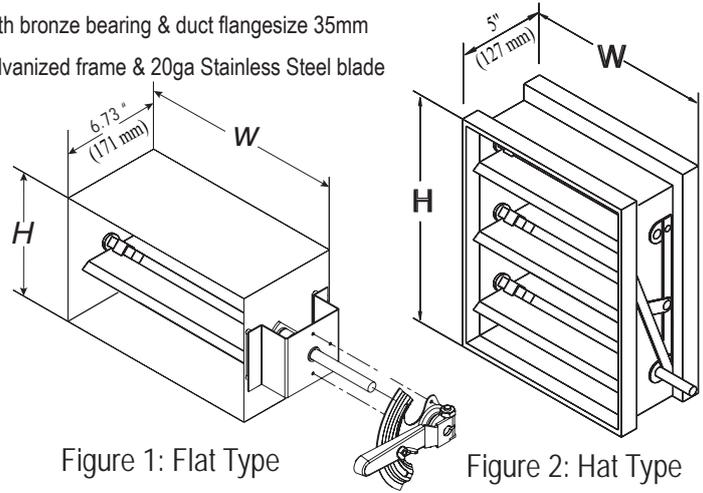


Figure 1: Flat Type

Figure 2: Hat Type

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

SIZE LIMITATION / THICKNESS:

UP TO 24" x 24"
0.8mm Frame
0.8mm Blade

UP TO 36" x 36"
0.8mm Frame
1.0mm Blade

UP TO 48" x 48"
1.0mm Frame
1.2mm Blade

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



AIR CONTROL DAMPER MODEL KACLO12 or 22 LEAKAGE RATED DAMPER

APPLICATION

KACLO12 or 22 is an Ultra low leakage damper designed to provide superior air control with high performance and heavy duty construction. Dampers are especially designed for manual & motorized balancing & Shut off applications. They are suitable for use in the majority of commercial medium to high pressure and velocity HVAC systems. They comply to IECC (International Energy Conservation Code) with a leakage rating of 3cfm/ft² at 1"Wg pressure (55cmh/m² at 0.25Kpa) or less.

STANDARD CONSTRUCTION

FRAME:

16 Ga galvanized steel interlocking hat channel frame construction.

BLADES:

16 Ga galvanized steel 3V type blades
Parallel blades model KACLO12
Opposed blades model KACLO22

SEALS:

Stainless Steel Jamb Seal
Rubber Foam Blade Seal

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

MINIMUM SIZES:

- a) SINGLE BLADE: 6"W(152mm) x 6"H(152mm)
- b) MULTI-BLADES: 6"W(152mm) x 14"H(355mm) & 19"W(482mm) x 12"H(305mm)

MAXIMUM SIZES:

- a) SINGLE BLADE: 48"W(1219mm) x 10"H(254mm) & 18"W(457mm) x 12"H(305mm)
- b) MULTI-BLADES SINGLE SECTION: 48"W(1219mm)x 48"H(1219mm)

MULTI-SECTIONS: UNLIMITED

Dampers are supplied 1/4" less than order WIDTH & HEIGHT unless specified "ACTUAL SIZE"



OPTIONS:

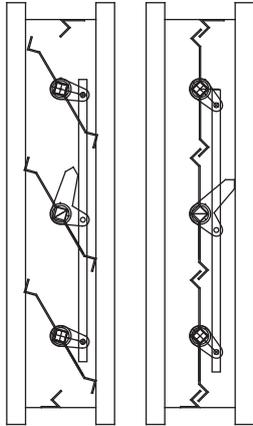
- 1) BEARINGS:
Bronze bearings (std for motorized dampers) or stainless steel bearings.
- 2) FRAME CONSTRUCTION
Aluminum or stainless steel frame construction.
- 3) BLADES CONSTRUCTION
Aluminum or stainless steel blades construction.
- 4) ACTUATORS:
a) Electric (24,120 & 230V) or pneumatic.
b) Spring return or non spring return.
c) With or without auxiliary switch.
- 5) Blades indicator switch - BIS
- 6) FLANGES:
Standard duct flanges 35 mm (with 1.5 mm thickness for damper without sleeve or same as sleeve thickness) or duct mate flanges 35mm
- 7) SLEEVES :
a) Refer to the air control damper sleeve catalogue for standard type of sleeve
b) Double skin
- 8) EXTENDED SHAFT (without Hand Quadrant):
4.7" (120mm) extended Shaft (round or square) beyond the air control frame.
- 9) 2" Elevated hand bracket.



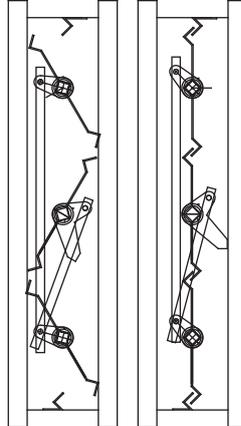
AIR CONTROL DAMPER

MODEL KACLO12 or 22

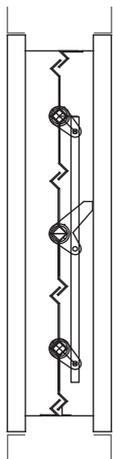
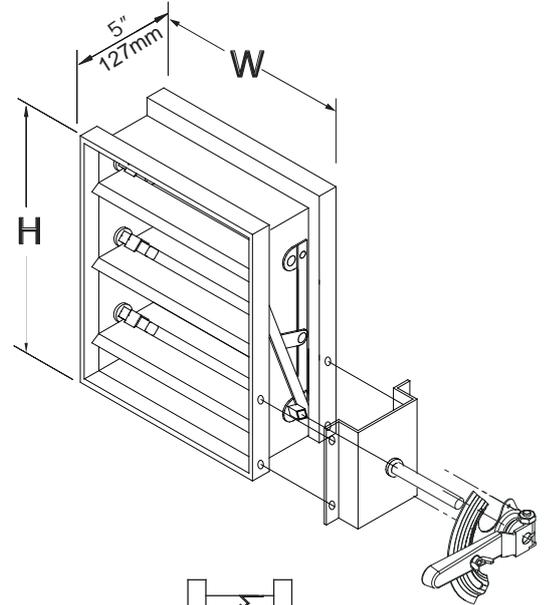
DETAILS



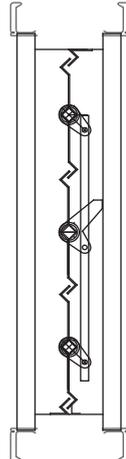
Parallel Blades



Opposed Blades



Duct Flanges 35mm



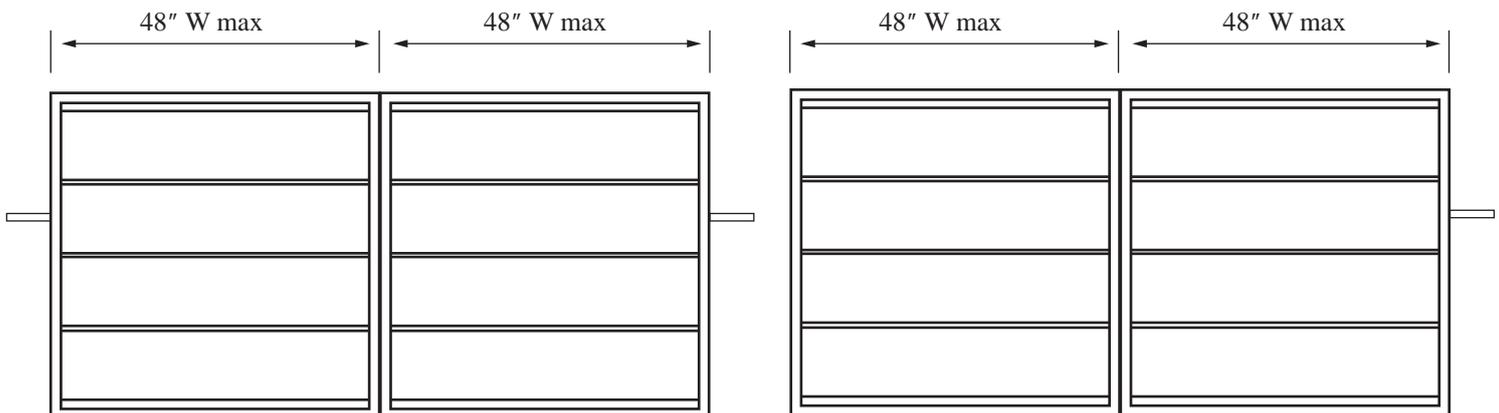
Duct Mate Flanges 35mm



Motorized Damper

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.



Standard 2 sections assembly with Hand-quadrant (or Motor) on each side

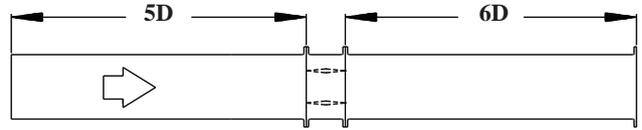
Optional 2 sections assembly with Hand-quadrant (or Motor) on 1 side



AIR CONTROL DAMPER MODEL KACLO12 & 22 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

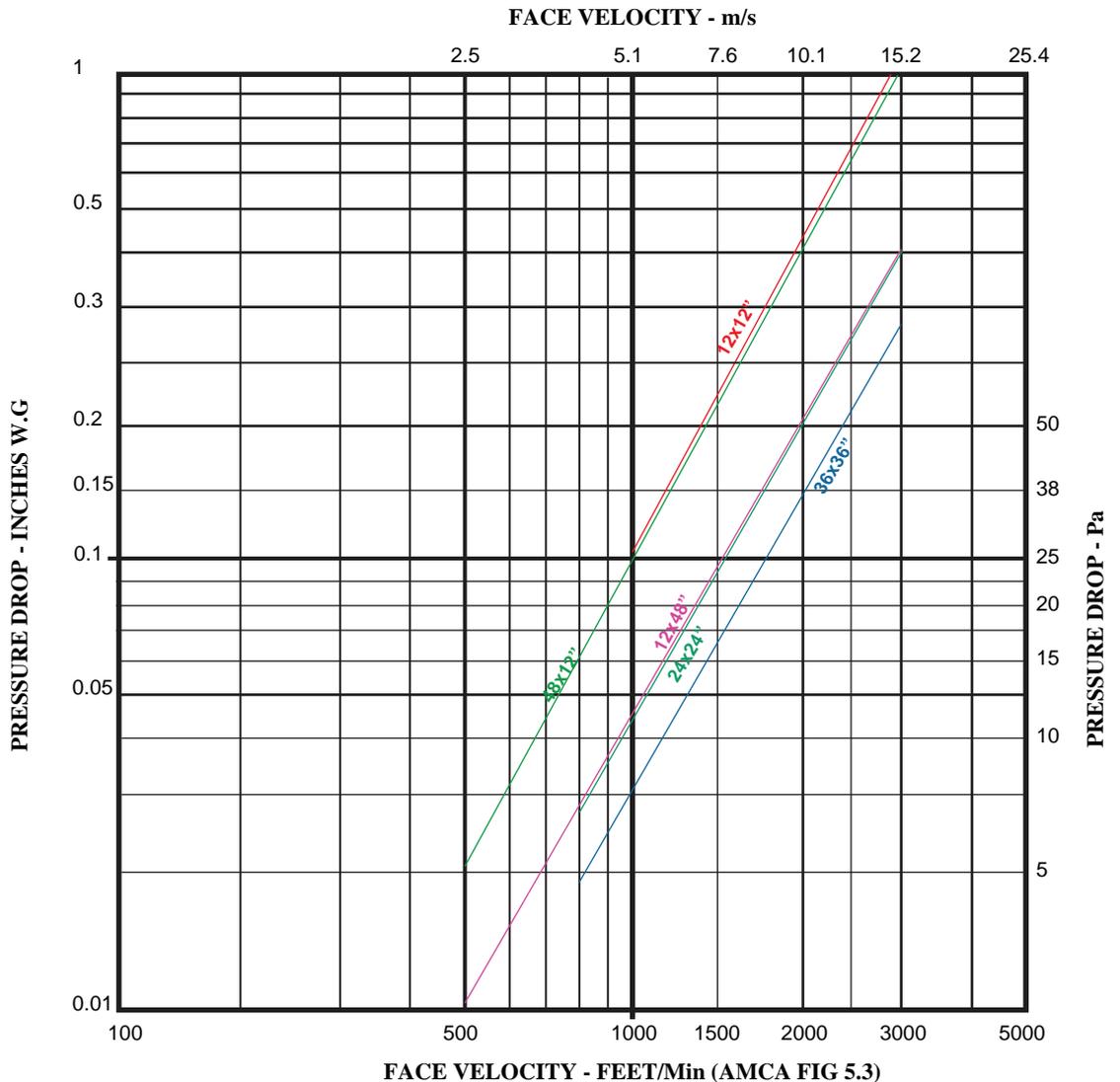
36"x36" (914x914mm)

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 KACLO12 & 22 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 Leakage and Air Performance ratings.





AIR CONTROL DAMPER

MODEL KACLO12 or 22

LEAKAGE

AMCA Certified Leakage

Maximum Damper Width	Leakage Class at:	
	1 in.Wg (0.25Kpa)	4 in.Wg (1.0 Kpa)
36 in. (914mm)	1	1
48 in. (1219mm)	1	2

Leakage Class Definitions:

Leakage Class 1A - 3 cfm/ft² @ 1 in. wg (0.015 m³/s/ m² @ 0.25 kPa)

Leakage Class 1 - 4 cfm/ft² @ 1 in. wg (0.020 m³/s/ m² @ 0.25 kPa)

Leakage Class 1 - 8 cfm/ft² @ 4 in. wg (0.041 m³/s/ m² @ 1.0 kPa)

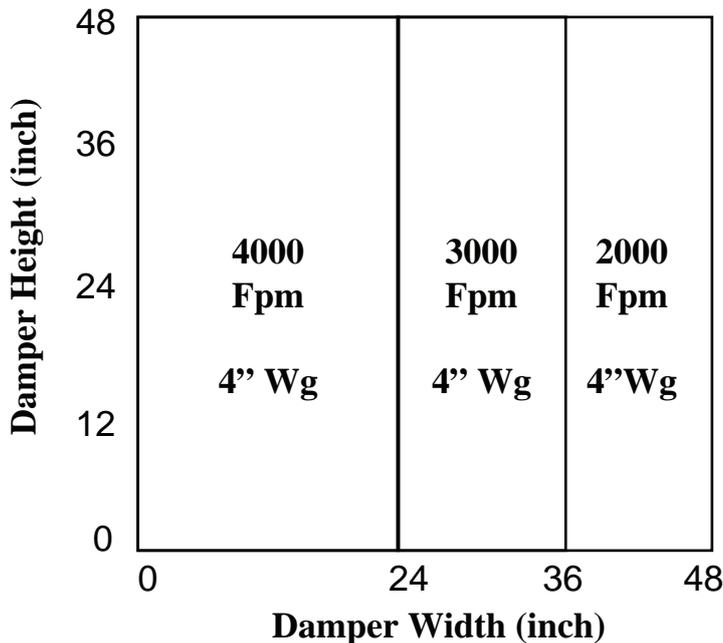


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Air leakage is based on operation between 32°F (0°C) and 120°F (49°C). Tested for leakage in accordance with ANSI/AMCA Standard 500-D, Figure 5.5.

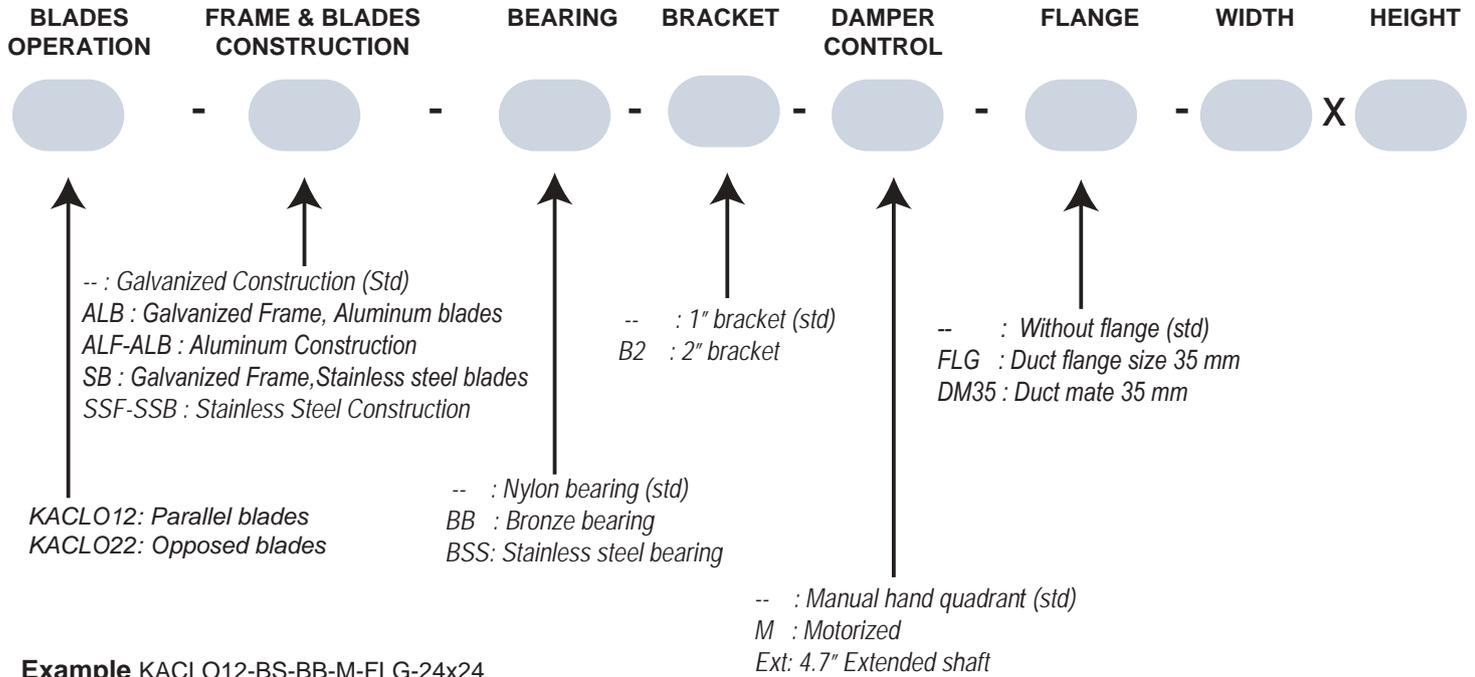
Data Are based on a Torque of 21in.lb/ft² applied to close & seat the damper during the test

Velocity & Pressure Limitations





AIR CONTROL DAMPER MODEL KACLO12 or 22 ORDERING INFORMATION

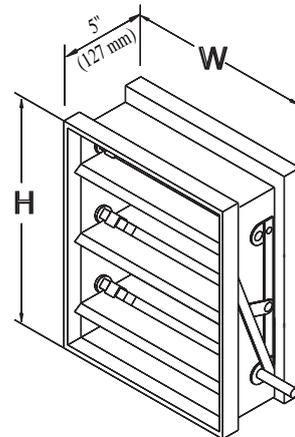


Example KACLO12-BS-BB-M-FLG-24x24

ACTUATOR SELECTION:

Please select the specifications needed for the actuator:

Electric	<input type="checkbox"/>	Pneumatic	<input type="checkbox"/>
24 VAC	<input type="checkbox"/>	230VAC	<input type="checkbox"/>
Spring return	<input type="checkbox"/>	Non spring return	<input type="checkbox"/>
On/Off	<input type="checkbox"/>	Modulating	<input type="checkbox"/>
With auxiliary switch	<input type="checkbox"/>	Without auxiliary switch	<input type="checkbox"/>



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

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