SSIDHP-C

AQC VOLUME CONTROL EQUIPMENT

HIGH PRESSURE STAINLESS STEEL INDUSTRIAL DAMPER

- Heavy Duty Control Damper
- Stainless Steel
- High temperature design
- Low maintenance
- High durability
- Double seal gasket
- Full shaft
- Ultra low leakage

amca WORLDWIDE CERTIFIED RATINGS
AIR LEAKAGE
AIR PERFORMANCE
AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.®
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Aireau Quality Control Inc. certifies that the SSIDHP-C shown herein are 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 Program.

The AMCA Certified Ratings Seal applies to air performance and air leakage ratings only.

Superior technology generating substantial operating savings

AQC DUST COLLECTING SYSTEMS

SSIDHP-C

High-Productivity Innovative Products

Heavy Duty Industrial Dampers

AQC Dampers are designed to meet the challenges that underground passages and metro tunnels are faced with daily such as high humidity, high pressure control, and a dust-laden environment. As important and vital as resolving these concerns are, they become nearly inconsequential during an emergency where the quality and workmanship of the systems cannot be compromised. AQC Dampers SSIDHP-C model offers high-precision grade work that leaves no room for error.

A Leading-Edge, High-Performance Company

The AQC Dust manufacturer fabricates a full range of safe, industrial dust collectors, as well as dust and smoke capture equipment and high pressure industrial dampers at the leading edge of air control technologies based on more than 30 years of experience in the field.

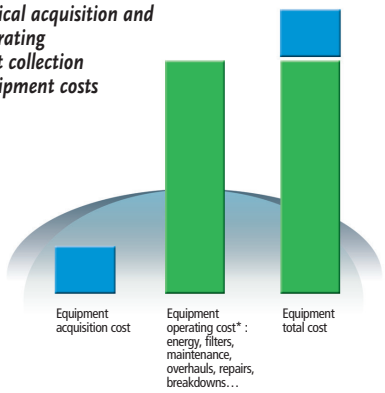
AQC's strength lies in its innovative products designed and developed to generate substantial savings throughout their entire operating life.

AQC is renowned for its technological innovation, safe and sophisticated equipment design, as well as its robust and precise product manufacturing. AQC stands out with its unique design of the baffles inside dust collectors making filter cleaning easy and a cartridge holder design that provides maximum filter surface, which enhances filter performance. The ultra-smooth concept inside AQC fume arms makes them maintenance-free and the durability of the heavy duty industrial dampers exceed expectations.

In short, AQC equipment is designed and built to generate substantial operating savings in terms of time, money and energy. This translates to major reductions in operating costs – from 10 to 20% – throughout the equipment's operating life. This scale of savings can represent a significant portion of the equipment's total purchase price. Companies looking to maximize their profitability should factor in these savings when purchasing equipment.

The unique design and manufacturing of AQC equipment generates significant savings for various reasons :

- Substantial increase in the duration of filters.
- Lower energy consumption during years of use.
- Significantly less maintenance (easy to clean, robust manufacturing, a minimum number of more reliable and durable parts).
- Reduced operating costs (less frequent overhauls, lack of or minimum down time, etc.).
- Lower administrative costs (coordination, follow-ups, supervision) due to much less frequent breakdowns.
- Safe design can prevent serious or even fatal accidents.
- Increased comfort and productivity of personnel.



The acquisition cost is just one part of the equation. It's the total cost including the operating cost ***throughout the life cycle of the equipment*** that must be kept low. This is what AQC delivers. The advanced technology, design, robustness, durability and safety of AQC products generate major savings during the equipment's entire life cycle.

APPLICATIONS

AQC Dampers are designed and engineered for use in the urban transit systems where high velocity and pressure exerts extensive amounts of stress on any mechanical system. The stainless-steel construction, low maintenance requirements, and double seal design are just some of the features that makes AQC Dampers the most reliable in the industry.

Pressure Equalization

In order to regulate the pressure levels within the tunnel, it is necessary for the dampers to allow absorption of the pressurized air (incoming trains) as well as reintroduction of air when the train passes. Single trackway tunnels have significant air movement considering the speed and size of the trains running through them. In order to keep the pressure at safe levels, it is a necessity for the dampers to allow the absorption of the air as a result of the incoming train and the reintroduction of air when it passes.

Portal Intake and Exhaust

Longer stretches of tunnels that do not have an intermediate air supply benefit greatly from AQC Dampers that allow for control of air intake, and the exhaust of smoke.

Emergency Fire/Smoke Control

AQC Dampers are tactically spaced along the tunnel and have the following important emergency functions.

1. Pressurize the tunnel section to allow safe escape for all individuals.
2. Removing smoke from areas with passenger access will be achieved by a zone of negative pressure.

TECHNICAL DATA

All damper models below were tested as per ANSI / AMCA Standard 500-D.

Tested damper model and size

CHART 1

Model	Dimensions in / mm
SSDIHP-C-1212	12 x 12 / 305 x 305
SSDIHP-C-2414	24 x 24 / 610 x 610
SSDIHP-C-3636	36 x 36 / 915 x 915
SSDIHP-C-4812	48 x 12 / 1220 x 305
SSDIHP-C-1248	12 x 48 / 305 x 1220
SSDIHP-C-6036	60 x 36 / 1524 x 915

Note : 7" to 12" (178mm to 305mm).

Tunnel Ventilation Dampers

AQC Dampers are designed to meet the challenges that underground passages and metro tunnels are faced with on a daily basis such as high humidity, high pressure, and a dust-laden environment. As important and vital as resolving these concerns are, they become nearly inconsequential during an emergency where the quality and workmanship of the systems cannot be compromised. AQC Dampers SSIDHP-C model offer high-precision grade work that leaves no room for error.

Construction

Depending on the environment and project requirements, AQC SSIDHP-C Dampers offer a variety of different designs as well as materials:

- Fabricated airfoil blade
- Fire rated fabricated airfoil blade
- Extruded aluminum blade

Materials:

- Galvanized steel
- 304 stainless steel
- 316/316L stainless steel
- Aluminum (blades)

Reliability

Various tests were conducted on the AQC SSIDHP-C Dampers:

1. NFPA 130 and 502 compliance: At least one hour at 482 °F (250 °C)
2. British Standard 476: At least one hour 752 °F (400 °C)

AQC has the in-house capability to perform a multitude of tests including the cyclic pressure test. The piston effect is also taken into account (effect similar to passing trains).

Maintainability

Several characteristics make the SSIDHP-C Dampers a simple system to maintain throughout its lifetime:

- Ball bearings are made of 316 stainless steel, requiring no lubrication or maintenance
- Linkages are designed for L/360 deflection
- Axles are bolted to the damper blade permitting easy removal (if needed)

STANDARDS AND CERTIFICATIONS

AMCA Standard 500-D

AMCA International's Certified Ratings Program (CRP) assures that a product line has been tested and rated in conformance with AMCA International's test standards and rating requirements.

NFPA 130

Standard for Fixed Guideway Transit and Passenger Rail Systems. This standard specifies fire protection and life safety requirements for underground, surface, and elevated fixed guideway transit and passenger rail systems.

NFPA 502

Standard for Road Tunnels, Bridges, and other Limited Access highways. This standard provides fire protection and fire life safety requirements for limited access highways, road tunnels, bridges, elevated highways, depressed highways, and roadways that are located beneath air-right structures.

BS476 Part 20

Fire tests on building materials and structures. Method for determination of the fire resistance of elements of construction.

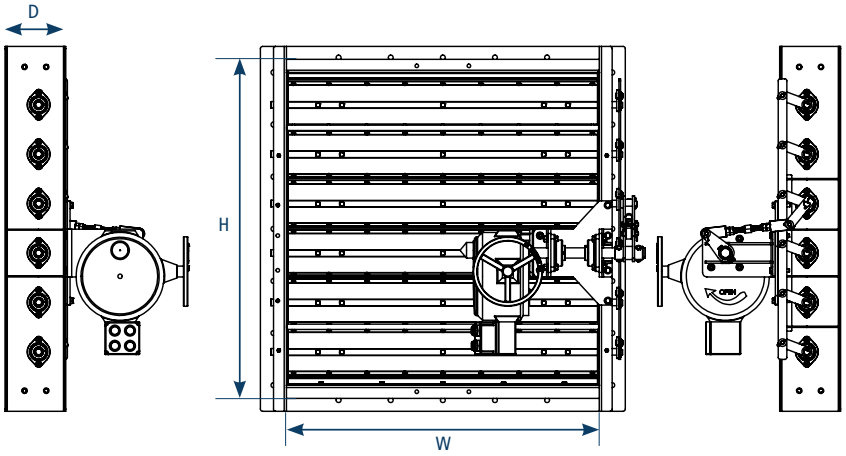
Summary of specifications

CHART 2

Damper construction		Standard	Option
Frame	Material	304 SST	Galvanized
			316/316L SST
	Gauge	10 ga.	9 ga.
			8 ga.
	Depth	7" /178 mm	Available from 7" to 12"
Blade	Profile	Fabricated	Extruded
	Material	304 SST	Galvanized
			Aluminum
			316/316L SST
	Thickness	14 ga.	10 ga.
			12 ga.
			16 ga.
	Seals	Silicone @ 500 °F/260 °C	304/316 SST
			Fiberglass @ 752 °F / 400 °C
	Width	6" /152 mm	Available from 6" to 10"

Notes

- Free area of 80% or more
- Life Expectancy: 25 years with regular maintenance every 6 months
- Factory installed electric or pneumatic motor will be tested on request
- The dampers (open or close) will withstand up to 482 °F (250 °C) & 752 °F (400 °C) temperatures (for 2-hours)
- Dampers frame shall be 304 stainless steel box construction 10 gauge
- Steel blades are made of 14 gauge 304 stainless steel
- The SSIDHP-C Dampers have pressure sensitive jamb and blade edge seals to maximize sealing characteristics without unduly increasing torque requirements
- The SSIDHP-C Dampers have been tested to AMCA Standard 500-D
- Blades are 6" to 10" with gasket

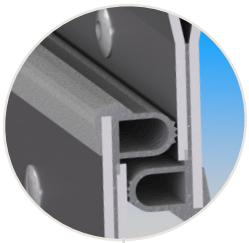


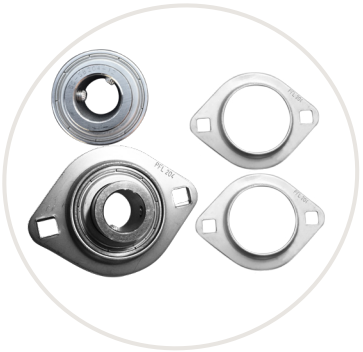
Optional Equipment

- Pneumatic actuator
- SP100 switch - position indicator of blades
- Hand locking quadrant
- Sideplates
- Flanged frames
- Factory installed sleeve

SSIDHP-C STANDARD FEATURES

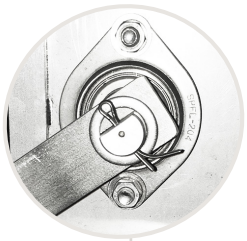
Double seal gasket



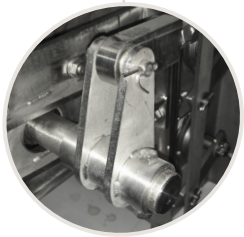


Ball bearing assembly design

D-shape shaft design



Actuator
(example shown)



Double linkage design

Blade adjustment screw

DESCRIPTION

SSIDHP-C industrial control dampers are specifically engineered and designed for use in transit tunnel systems, subways, as well as where tight shutoff at high velocity/pressure is required. The SSIDHP-C Dampers meet the demanding requirements for strength, leakage, and operability.

STANDARD CONSTRUCTION

Frame

- The frames are made of stainless steel or galvanized steel an have a U channel with the following dimensions: 3" x 7" x 11/5" (76 x 178 x 31 mm).
- Widths available ranging from 7" to 12" (178 mm to 305 mm)

Blades

- Double-walled 304 or 316 stainless steel blades designed with a full-length drive shaft to reduce the effect of torsion
- Parallel closing movement guarantees the simultaneous movement of all the blades
- Aerodynamic blade design
- The movement at the central pivot point creates an opposing blade closure which increases the seaL
- Available sizes ranging from 6" to 10" (152mm to 254mm)

Mechanical seal

- The unique **double seal** design allows an impeccable seal between each blade when the damper is in a closed position.
- A fiberglass **double seal** is also available for applications where the operating temperatures can reach up to 800°F (426°C)

Jamb Seal

The 301 stainless steel jamb seal is attached directly to the inner perimeter of the damper frame, thus increasing its sealing capabilities

Transmission axles (shaft)

- The shaft is machined from a single piece with a precision of 1/1000" tolerance ensuring simultaneous closing of all blades.
- The torque transmitted from the transmission shaft will be divided propertionaly
- Both ends of the machined shaft are D-shape designed.
- Bolted to the flat surface of the airfoil blade. Easily removable design for maintenance

Stainless steel surface finish

All damper components are fabricated from 304 stainless steel with a 2b finish. This surface finish provides superior corrosion resistance

Hardware

The assembly hardware is made of 316 stainless steel

Bearings

- Designed to operate at high temperature
- Standard life lubricated
- Made of stainless steel
- Bearings installed at both ends of the transmission shaft ensuring smooth and frictionless movements

Linkage

- Drivetrain assembly attached to the outside of the frame
- 1/4" x 1 1/8" (6 x 28 mm) tie bars for each blade
- Vertical bars of 3/16" x 3/4" (5 x 19 mm)
- Hardware of 316 stainless steel

TESTED DESIGN FEATURES

Pressure reversal cycles

3 000 000 simulated train pressure reversals @ 15 in w.g. (3.7 kPa) of differential pressure with the optional steel airfoil blade

Temperature limits

- -72 °F (-58 °C) minimum
- 482 °F (250 °C) maximum
- 752 °F (400 °C) high temperature design

Rating

CHART 3

Damper width in/mm	Maximum system pressure in w.g./kPa	Max. system velocity fpm (m/s)
12/305	33/8.2	4000 (20.3)
24/610	28/6.9	
36/914	24/6.0	
48/1219	19/4.7	
60/1524	18/4.5	

LEAKAGE

Leakage testing was conducted in accordance with ANSI/AMCA 500-D, Figure 5.5. in the intake direction. Data is based on a vertically mounted damper. Data is based on a torque of 45 lb-in/ft2 applied to close and seal the damper during the test. Air leakage is based on operation between 32 °F - 120 °F (0 °C - 49 °C) and converted to standard air density 0.075 lb/ft³ (1,201 kg/m³).

Classifications of dampers

CHART 4

Model	1 in	4 in
36"x 36" /914 x 914 mm	1A	1
12"x 48" /305 x 1219 mm	1A	1
60"x 36" /1524 x 914 mm	1A	1

AMCA leakage class definitions

CHART 5

Class	Pressure MAXIMUM ALLOWABLE LEAKAGE CFM/ft² (l/s/m²) 1 in w.g. 0.25 kPa	4 in w.g. 1.0 kPa	6 in w.g. 1.5 kPa	8 in w.g. 2.0 kPa
1A	3/15.2	n/a	n/a	n/a
1	4/20.3	8/40.6	9.8/49.8	11.3/57.4

Minimum size

- 12" x 12" (305 mm x 305 mm)
- Single blade, parallel action: 6" to 10" (152 mm to 254 mm) two blades, parallel or opposed action 12" x 12" (305 mm x 305mm)
- Blade assembly with double gasket design from 6" to 10" total

Maximum Size

- Single section: 60" x 96" (1524 mm x 2438 mm)
- Multiple section assembly (all sizes available)

Pressure reversal cycles

Minimum 3 000 000 simulated train pressure reversals @ 15 in w.g. (3.7 kPa) of differential pressure with the optional steel airfoil blade

Temperature limits

-72 °F (-58 °C) minimum and
482 °F (250 °C) maximum.
752 °F (400 °C) high temperature

Actuator (option)

- Electric actuator
- Pneumatic

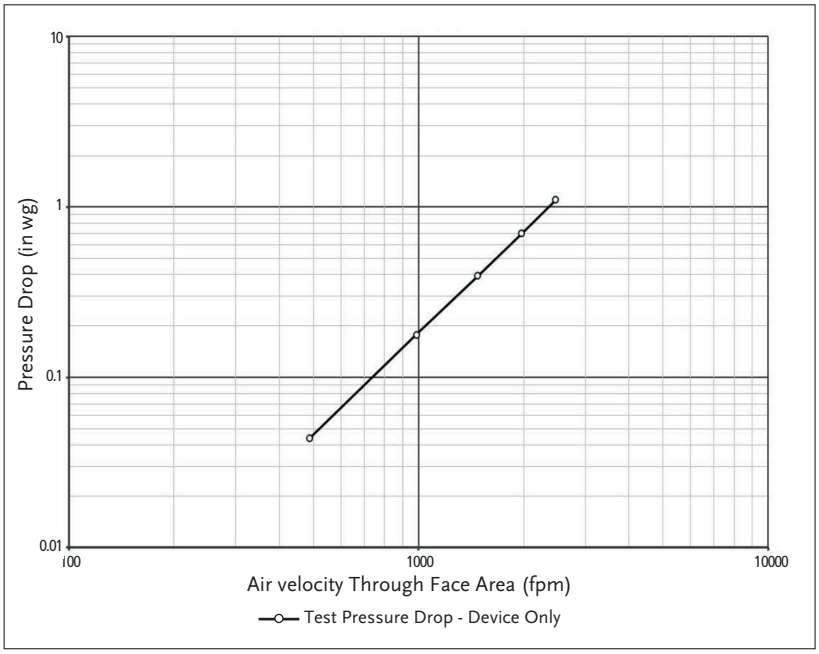
Features

- Non-corrosive axle bearings
- Mechanically fastened blade seals

VELOCITY VS PRESSURE DROP

Performance data results from testing the damper in the accordance with AMCA Standard 500-D using Figure 5.5. All data has been corrected to represent standard air density at 0.075 lb / ft³ (1,201 kg / m³).

Velocity vs pressure drop 36" x 36" (914 x 914 mm) damper



Pressure drop - Tested to AMCA figure 5.5 36"x 36" (914 x 914 mm)

CHART 6

Velocity fpm	Pressure drop in/w.g.
487	0.04
986	0.18
1476	0.39
1972	0.7
2464	1

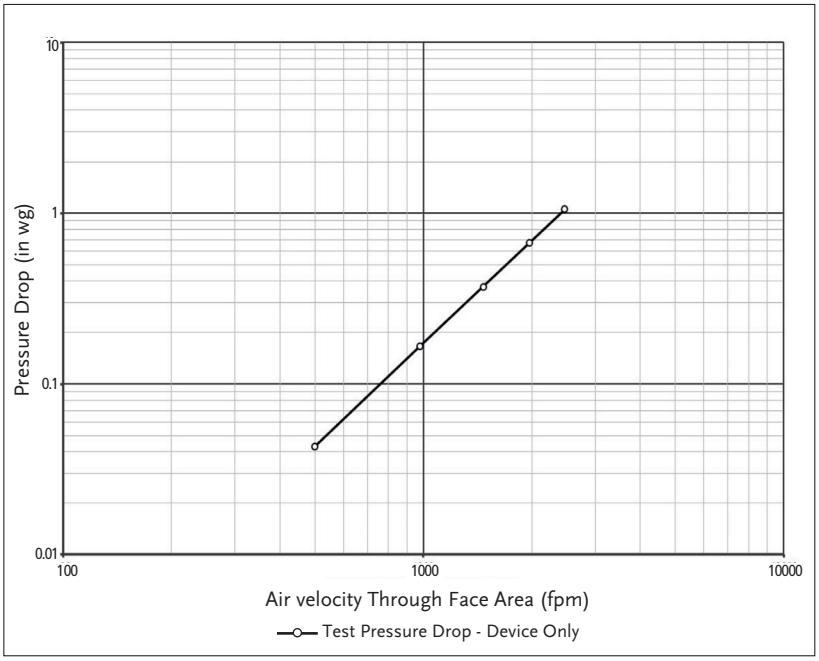
Velocity vs pressure drop 12" x 48" (305 x 1219 mm) damper

Pressure drop - Tested to AMCA figure 5.5 12" x 48" (305 x 1219 mm)

CHART 7

Velocity fpm	Pressure drop In/w.g.
490	0.03
981	0.14
1479	0.31
1978	0.55
2478	0.86

Velocity vs pressure drop 12” x 12” (305 x 305 mm) damper

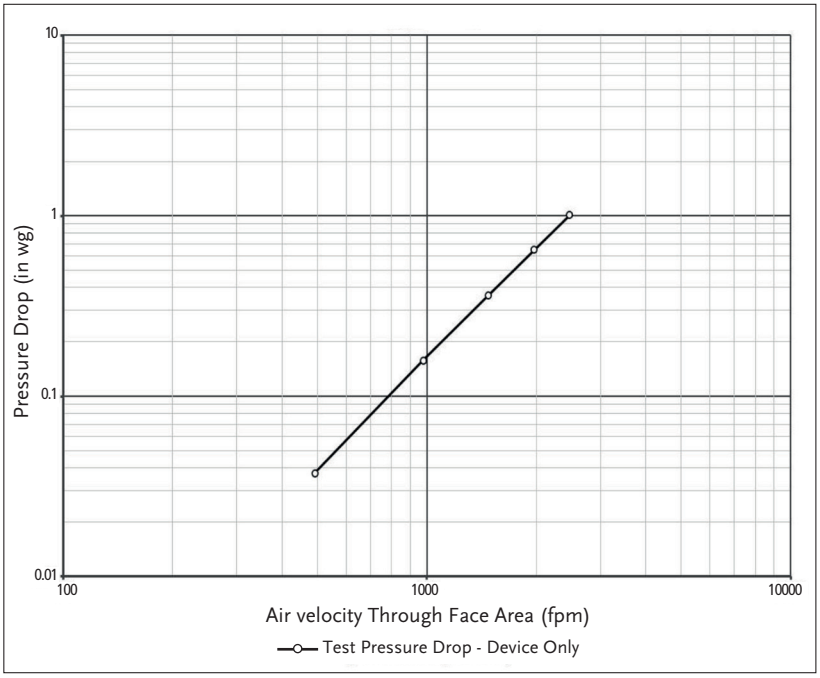


Pressure drop - Tested to AMCA figure 5.5 12” x 12” (305 x 305 mm)

CHART 8

Velocity fpm	Pressure drop In/w.g.
500	0.04
979	0.17
1467	0.37
1965	0.67
2466	1

Velocity vs pressure drop 24” x 24” (610 x 610 mm) damper



Pressure drop - Tested to AMCA figure 5.5 24”x 24” (610 x 610 mm)

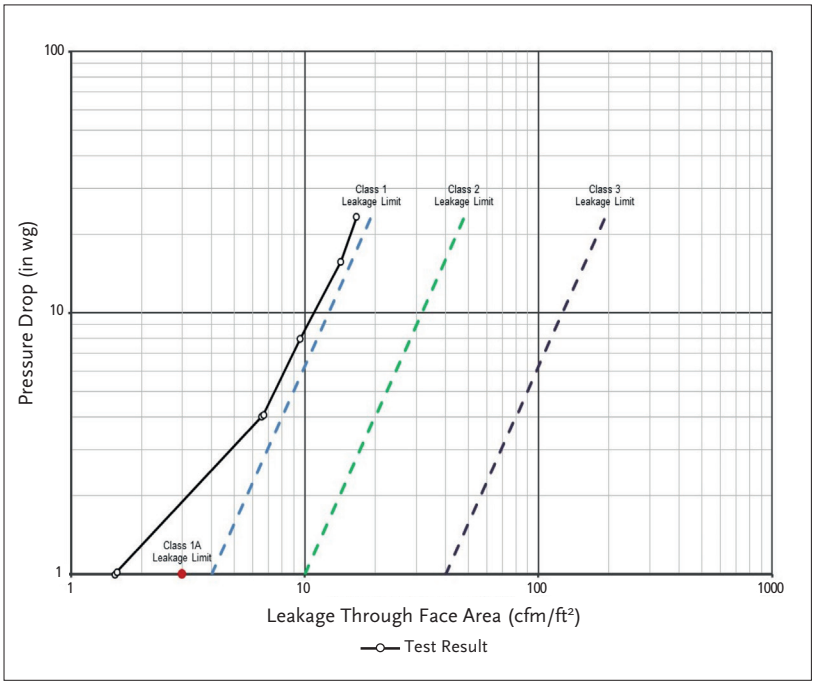
CHART 9

Velocity fpm	Pressure drop In/w.g.
492	0.04
977	0.16
1473	0.36
1971	0.65
2464	1

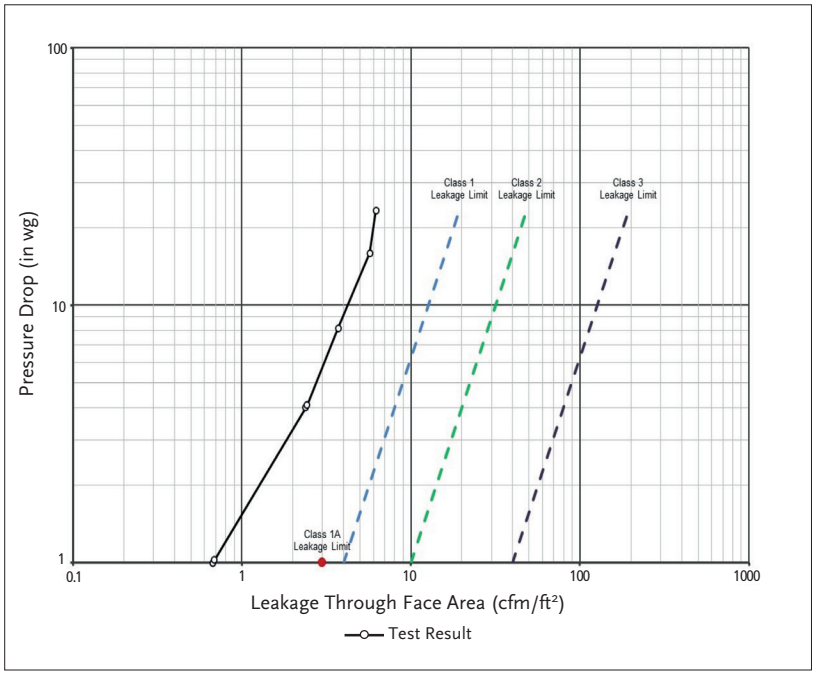
LEAKAGE

Results below are not certified by AMCA.

Leakage vs pressure drop 12" x 12" (305 x 305 mm) damper



Leakage vs pressure drop 24" x 24" (610 x 610 mm) damper



High Pressure Industrial Damper

SSIDHP-C

HIGH PRESSURE INDUSTRIAL DAMPER SPECIFICATIONS

1. Dimensions:

a) Height from 12" to 96" (305 mm to 2438 mm)
specify height: _____

b) Width from 12" to 60" (305 mm to 1524 mm)
specify width: _____

2. Frame material:

a) Standard: 304 SST ☐
b) Galvanized ☐
c) 316 SST ☐
d) 316L ☐

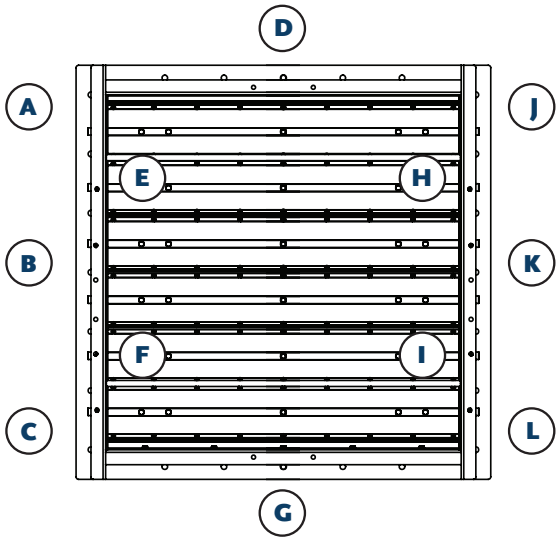
3. Frame gauge:

a) Standard: 10 ga. ☐
b) 9 ga. ☐
c) 8 ga. ☐

4. Frame depth:

a) Depth from 7" to 12" (178 mm to 305 mm)
specify depth: _____

b) Custom sizes available
specify depth: _____



5. Blade profile:

a) Standard: Fabricated airfoil ☐
b) Extruded ☐

6. Blade Material:

a) Standard: 304 SST ☐
b) Galvanized ☐
c) Aluminum ☐
d) 316 SST ☐

7. Blade thickness:

a) Standard: 14 ga. ☐
b) 10 ga. ☐
c) 12 ga. ☐
d) 16 ga. ☐

7. Blade seals:

a) Standard: Silicone @ 500 °F (260 °C) ☐
b) 304 SST ☐
c) 316 SST ☐
d) Fiberglass @ 752 °F (400 °C) ☐

8. Optional equipment:

a) Pneumatic actuator ☐
b) SP100 switch - position indicator of blades ☐
c) Hand locking quadrant ☐
d) Sideplates ☐
e) Flanged frames ☐
f) Factory installed sleeve ☐

8. Actuator position:

a) Select actuator positioning (refert to drawing on left)
position: _____

Note : Specifications listed above may be modified to suit application. Contact AQC or representative for information.

Your AQC representative is :

AQC DUST COLLECTING SYSTEMS

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