GREENHECK

Model DFD-M210
Multi-Blade FIRE DAMPER

Steel 3V Blades
UL555 1½ Hour Fire Resistance Rating
4 hour Fire Resistance Rating (BS476)

Application
Model DFD-M210 is a multi-blade fire damper with 3V style blades. The DFD-M210 has been qualified to 10.2 m/s (2000 fpm) and 1.0kPa (4 in. wg.) for operation and dynamic closure in emergency fire situations. Model DFD-M210 may be installed vertically (with blades running horizontal) or horizontally and is rated for airflow in either direction.

Model DFD-M210 has also been tested in accordance with BS476 to 4 hours at Warrrington Fire, UK, and is approved for fire partitions of 4 hours or less where British Standards are required.

Model DFD-M210 is intended for installation in accordance with fire damper requirements established by:

National Fire Protection Association
NFPA Standards 80, 90A & 101

ICBO Uniform Building Codes
IBC International Building Codes
SBCCI Standard Building Codes

British Standard BS476
Tested to 4 hours at Warrington Fire, UK

Ratings
UL 555 Fire Resistance Rating

Fire Rating: 1½ Hours
Dynamic Closure Rating: Actual limits are size dependent
Maximum Velocity: 10.2 m/s (2000 fpm)
Maximum Pressure: 1 kPa (4 in. wg)

BS476 Fire Resistance Rating

Fire Rating: 4 hours

Standard Construction

Frame:	127mm x 25 mm (5 in. x 1 in.) 1.5mm (16 gauge) galvanized steel hat channel with reinforced corners. A low profile head and sill are used on sizes less than 432mm (17 in.) high to maximize free area and performance.
Blades:	1.5mm (16 gauge) galvanized steel, reinforced with 3 longitudinal structurally designed vee's.
Seals:	Flexible stainless steel jamb seals.
Linkage:	Concealed in jamb.
Fusible Link:	UL listed 74ºC (165°F)
Axles:	13mm (½ in.) dia. plated steel.
Bearings:	Bronze sleeve type.
Actuator:	Manual quadrant.

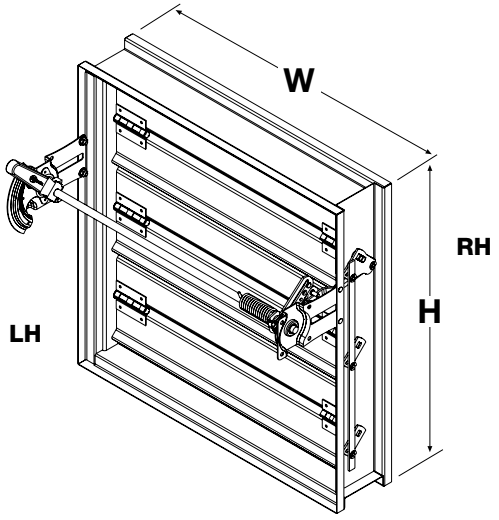
"UL CLASSIFIED (see complete marking on product)"
"UL CLASSIFIED to Canadian safety standards (see complete marking on product)"
Standard 555 (Listing #R13317)

Greenheck Kunshan Co. Ltd. and Greenheck Fan Corporation certifies that the model DFD-M210 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 only.

Size Limitations

Minimum Size:	203mm W x 152mm H (8 in. W x 6 in. H)
Maximum Size:	
Single Section:	914mm W x 914mm H (36 in. W x 36 in. H) or 813mm W x 1270mm H (32 in. W x 50 in. H)
Multi Section:	1626mm W x 1270mm H (64 in. W x 50 in. H)

Optional Features
- 100ºC (212°F), 141ºC (286°F), and 177ºC (350°F) fusible links (UL only)
- 69°C (155°F) fusible links (BS476)
- Factory mounted sleeves
- Retaining angles
- Sleeve with integral flange on both sides



*W & H dimensions furnished approximately 6mm (¼ in.) undersize. (Add sleeve thickness for overall sleeved damper dimension)

Pressure Drop Data DFD-M210

This pressure drop testing was conducted in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent standard air at a density of 1.201 kg/m^3.

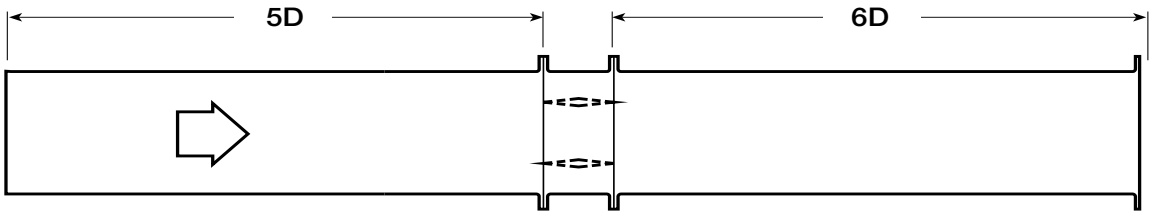
Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

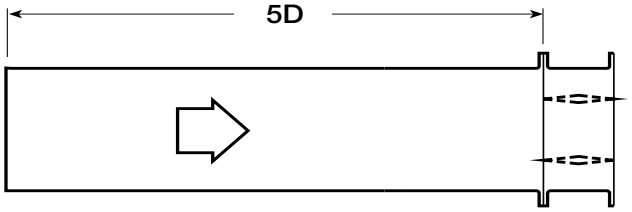
AMCA Test Figures

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

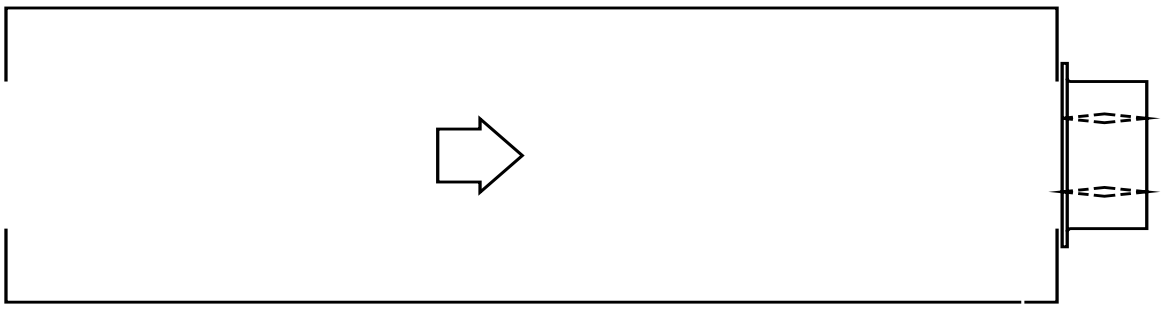
Figure 5.2 Illustrates a ducted damper exhausting air into an open area. This configuration has a lower pressure drop than Figure 5.5 because entrance losses are minimized by a straight duct run upstream of the damper.

Figure 5.5 Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.





$$D \sqrt{\frac{4\,(W)\,(H)}{3.14}}$$



AMCA 5.2 Pressure Drop

DFD-M210

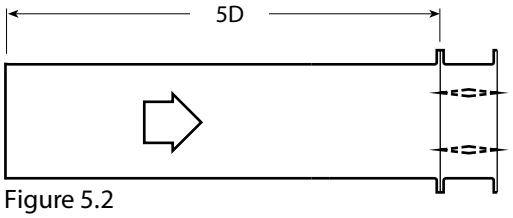
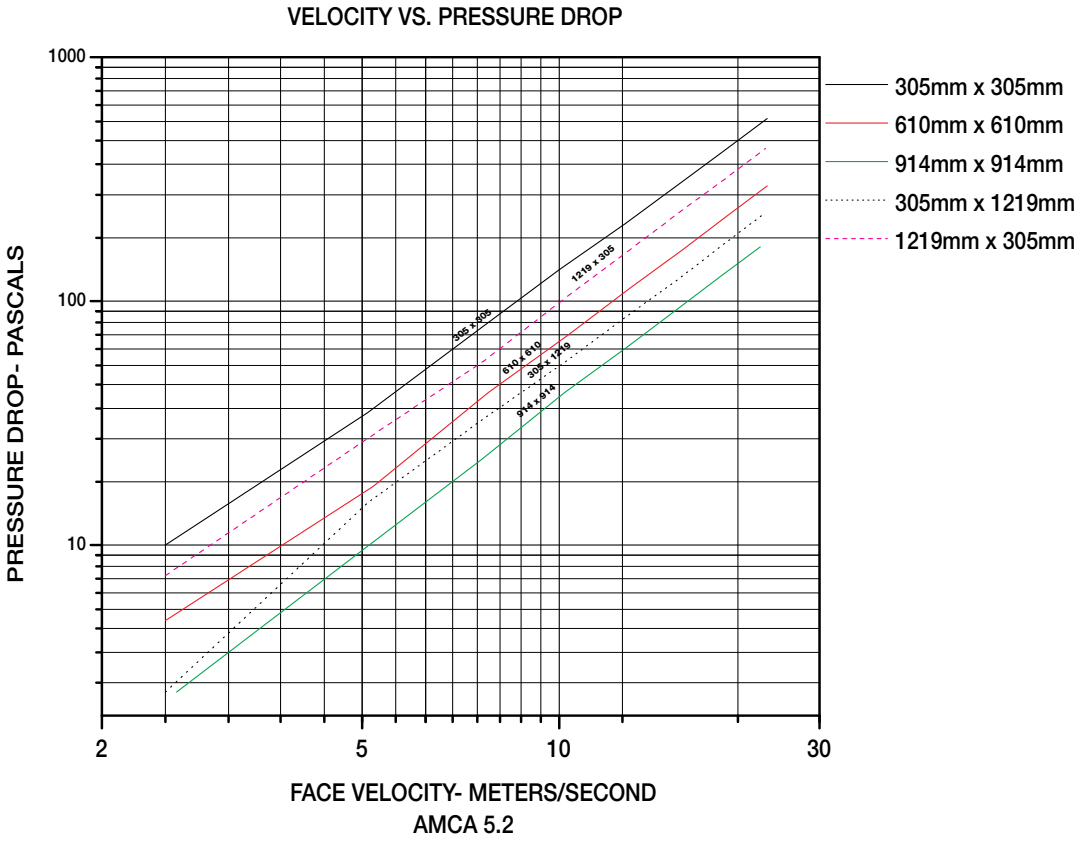


Figure 5.2



305mm x 305mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	10
5.1	35
7.7	80
10	135
12.6	207
15.5	311
17.8	411
20.8	561

610mm x 610mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	5
5.2	17
7.8	42
10.3	72
12.9	115
15.4	162
18.1	224
20.8	296

914mm x 914mm	
Velocity (m/s)	Pressure Drop (Pa)
2.6	3
5.1	10
7.6	22
10.2	42
12.7	65
15.3	95
17.7	127
20.3	167

305mm x 1219mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	3
5.1	15
7.6	32
10.3	57
12.9	90
15.3	125
18	174
20.5	227

1219mm x 305mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	8
5.1	27
7.7	57
10.3	105
12.9	164
15.6	242
17.9	316
20.7	424

Greenheck Kunshan Co. Ltd. and Greenheck Fan Corporation certifies that the model DFD-M210 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 only.

AMCA 5.3 Pressure Drop

DFD-M210

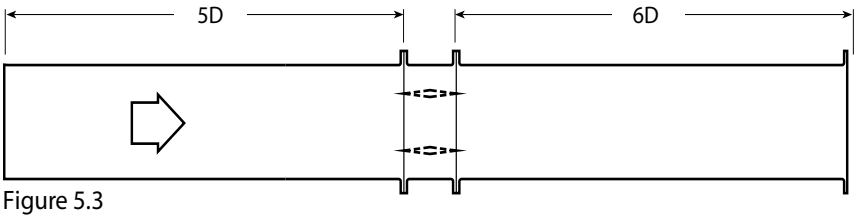
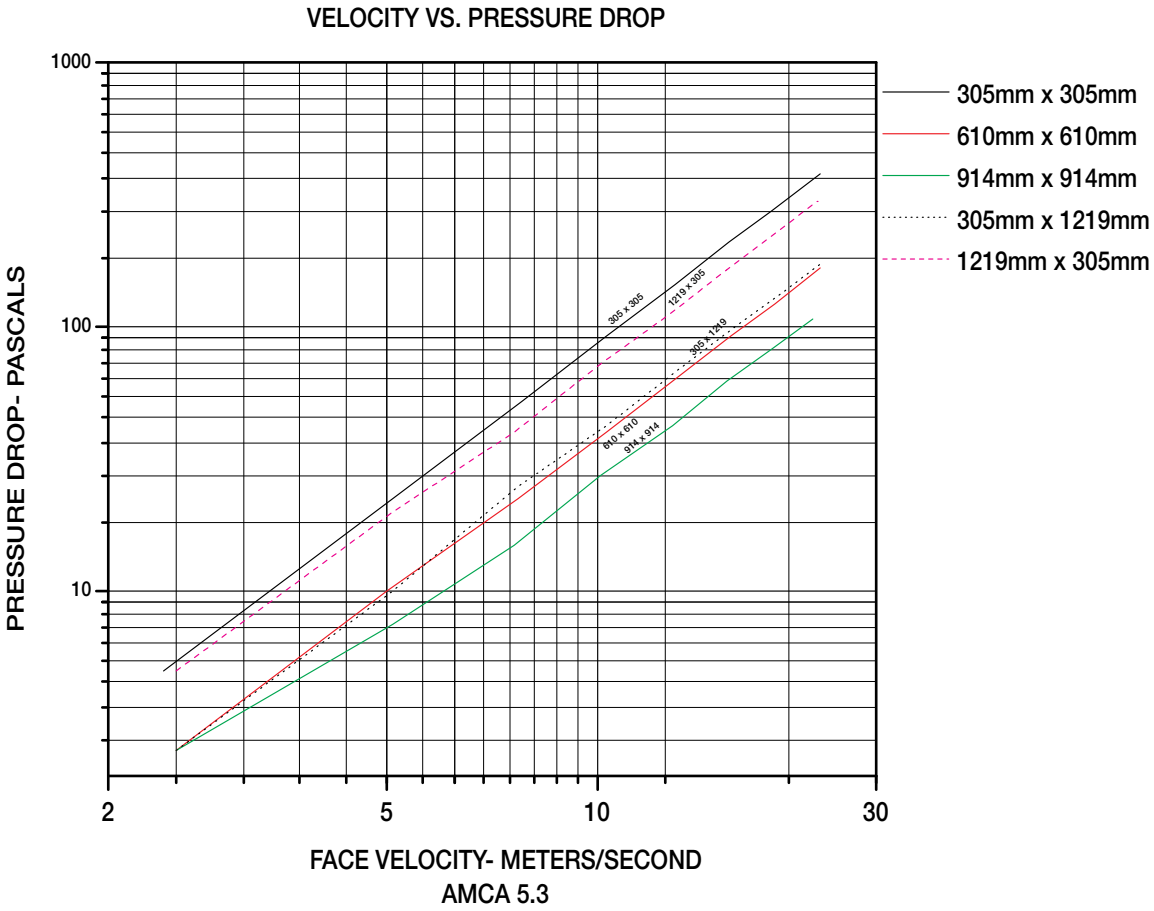


Figure 5.3



305mm x 305mm	
Velocity (m/s)	Pressure Drop (Pa)
2.4	5
5.1	22
7.8	52
10.3	92
12.9	145
15.4	209
17.7	274
20.8	379

610mm x 610mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	3
5	10
7.7	22
10.3	40
12.8	62
15.5	92
17.9	122
20.8	167

914mm x 914mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	3
5.1	8
7.6	15
10.1	27
12.8	42
15.3	62
17.7	82
20.3	107

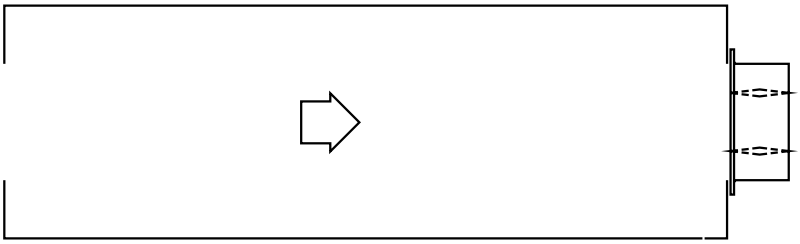
305mm x 1219mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	3
5.1	10
7.7	25
10.3	42
12.9	67
15.7	100
18.7	140
20.9	174

1219mm x 305mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	5
5.1	20
7.6	40
10.1	72
12.7	112
15.3	164
18	227
20.6	299

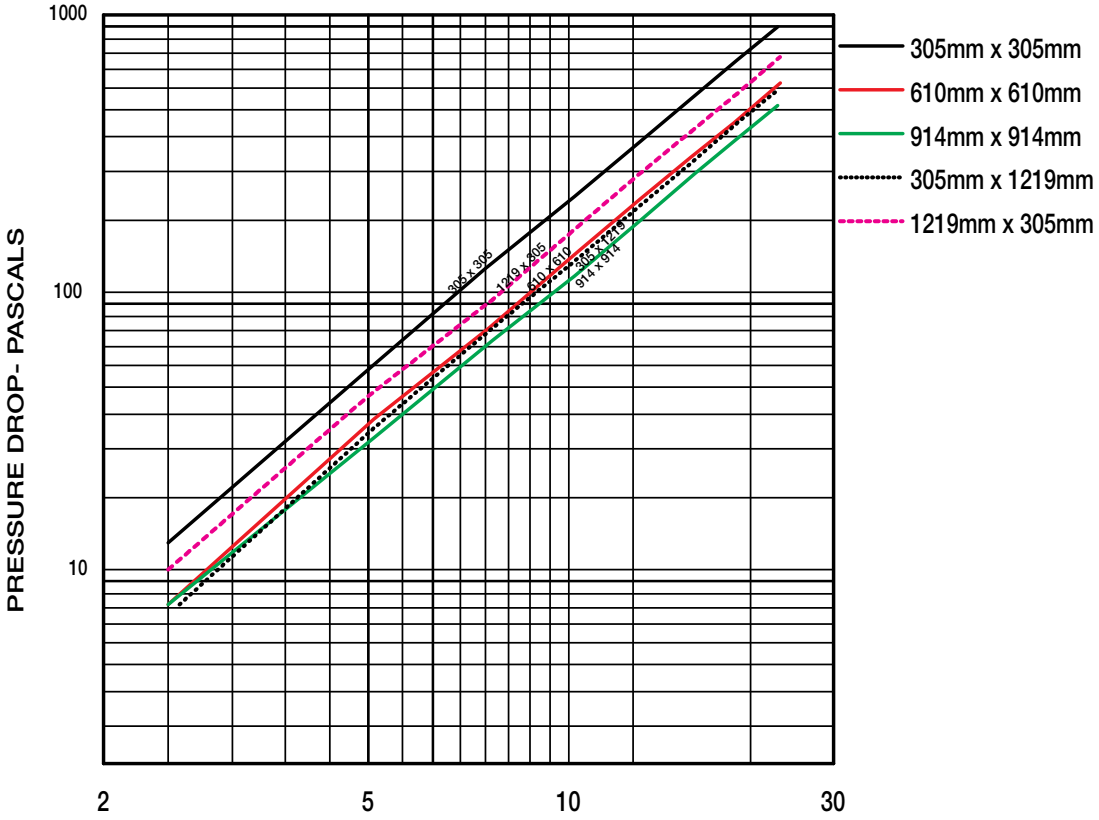
Greenheck Kunshan Co. Ltd. and Greenheck Fan Corporation certifies that the model DFD-M210 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to air performance ratings only.

AMCA 5.5 Pressure Drop

DFD-M210



VELOCITY VS. PRESSURE DROP



305mm x 305mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	13
5	55
7.5	122
10.2	222
12.7	349
15.4	508
17.9	688
20.6	907

610mm x 610mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	8
5	35
7.6	75
10.3	140
12.8	217
15.3	309
17.7	409
20.8	568

914mm x 914mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	8
5.1	30
7.7	67
10.2	115
12.9	184
15.5	269
18.1	354
20.6	471

305mm x 1219mm	
Velocity (m/s)	Pressure Drop (Pa)
2.6	8
5.1	32
7.7	75
10.2	130
12.7	202
15.5	301
18.1	416
20.6	536

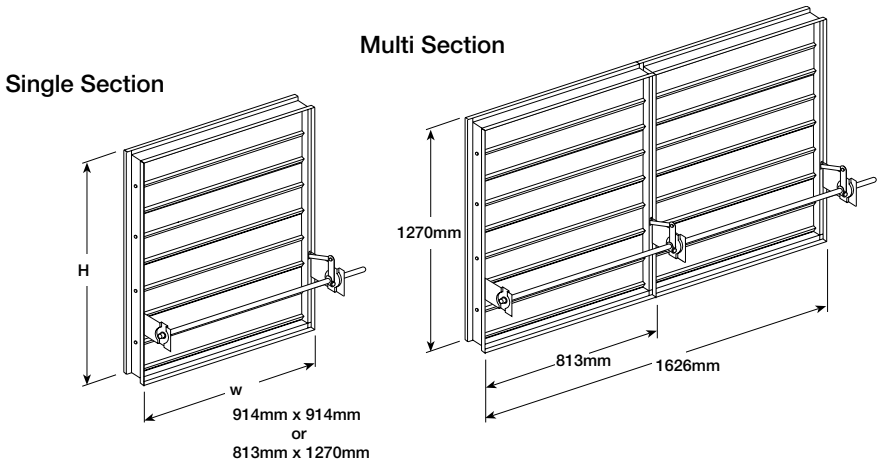
1219mm x 305mm	
Velocity (m/s)	Pressure Drop (Pa)
2.5	1
5	42
7.7	95
10.3	172
12.7	264
15.3	381
17.9	521
20.8	707

Greenheck Kunshan Co. Ltd. and Greenheck Fan Corporation certifies that the model DFD-M210 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 only.

DIMENSIONAL DATA SPECIFICATIONS

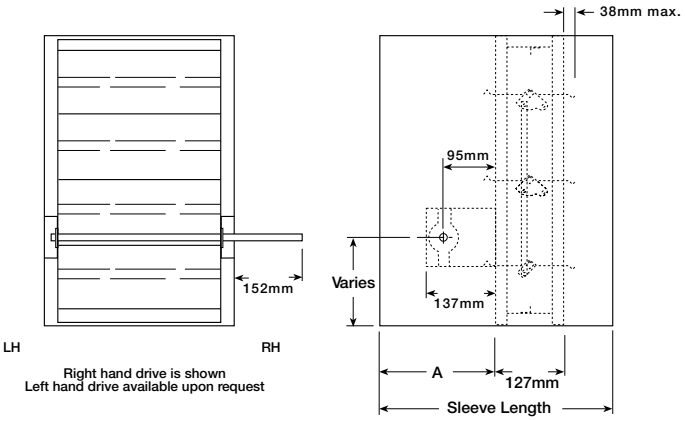
Damper Sizing Information

The following figure shows maximum damper section size.



Damper Sleeve Dimensional Data

The drawings below and corresponding table show the position of the DFD-M210 damper when mounted in a factory sleeve. The standard mounting locations provide enough space for the mounting of manual quadrant, controls and allow space for installation of retaining angles and duct connections.



The "A" dimension is the location of the damper mounted in a factory sleeve. The table below shows the Standard, Minimum, and Maximum "A" dimensions.

	"A" Dimension		
	Standard	Minimum	Maximum
All Dampers	183mm	137mm	406mm

[1]All dampers w/o OCI.

Note: Entire damper frame is not required to be installed within the wall.

The damper blades, when closed, should be contained in the wall.

Specifications

Fire Dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall meet the requirements of the latest edition of NFPA 80, 90A and 101.

Dampers shall be tested, rated and labeled in accordance with the latest edition of UL Standard 555. Dampers shall have a UL 555 fire rating of 1½ hours. Each damper shall be equipped with a heat responsive device which has been tested and approved for use with the damper assembly in accordance with UL 555. The heat responsive device shall have a temperature rating of (specifier select one of the following) 74ºC, 100ºC, 141ºC, or 177ºC. Dampers shall be UL labeled for use in dynamic systems. The damper shall have a dynamic closure pressure rating of 1 kPa.

Damper actuator shall be manual quadrant. Manufacturers submittal data shall indicate actuator space requirements around the damper.

The Damper Manufacturers submittal data shall certify all air performance pressure drop data is licensed in accordance with the AMCA Certified Ratings Program for Test Figures 5.2, 5.3 and 5.5. Damper air performance data shall be developed in accordance with the latest edition of AMCA Standard 500-D.

Damper blades shall be 1.5mm galvanized steel 3V type with three longitudinal grooves for reinforcement. Blades shall be completely symmetrical relative to their axle pivot point, presenting identical resistance to airflow and operation in either direction through the damper (blades that are non-symmetrical relative to their axle pivot point or utilize blade stops larger than 13mm are unacceptable).

Damper frame shall be 16 gauge galvanized steel formed into a structural hat channel shape with reinforced corners. Bearings shall be sintered bronze, permanently lubricated, synthetic (acetal) sleeve type rotating in extruded holes in the damper frame for maximum service. Axles shall be square and positively locked into the damper blade. Jamb seals shall be stainless steel compression type.

Basis of design is Greenheck Model DFD-M210.

GREENHECK
Greenheck Kunshan Co Ltd.
17 Qunyi Minying District • Kunshan Economic & Technical Development Zone
Kunshan, Jiangsu, China 215300
Tel: 0512-573-66666 • Fax: 0512-573-78633
www.greenheck.com