## STANDARD CONSTRUCTION

**FRAME**
Molded fiberglass channel with angle blade stop.
Vinyl Ester Resin. See table below for dimensions.

**BLADE**

**AXLE**
Pultruded fiberglass, Vinyl Ester Resin. See table below for diameter.

**BEARINGS**
Molded PTFE.

**CONTROL SHAFT**
Axle extends 6" beyond frame.

### SIZES

### MAXIMUM TEMPERATURE
200°F.

### MAXIMUM SYSTEM PRESSURE
30" w.g.

### MAXIMUM SYSTEM VELOCITY
6000 FPM.

Dimensions in parenthesis ( ) indicate millimeters.

### Frame Specifications

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Thick. X &quot;F&quot;</th>
<th>Thick. X &quot;C&quot;</th>
<th>Blade Edge Thickness</th>
<th>Axle Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-14&quot;</td>
<td>.375 x 2.187</td>
<td>.125 x 12 (3 x 305)</td>
<td>.25 (6)</td>
<td>1.00 (25)</td>
</tr>
<tr>
<td>16-20&quot;</td>
<td>.50 x 2.187</td>
<td>.125 x 12 (3 x 305)</td>
<td>.25 (6)</td>
<td>1.00 (25)</td>
</tr>
<tr>
<td>22-24&quot;</td>
<td>.50 x 2.187</td>
<td>.187 x 12 (5 x 305)</td>
<td>.25 (6)</td>
<td>1.50 (38)</td>
</tr>
<tr>
<td>26-36&quot;</td>
<td>.50 x 2.187</td>
<td>.187 x 12 (5 x 305)</td>
<td>.25 (6)</td>
<td>1.50 (38)</td>
</tr>
<tr>
<td>42&quot; (1067)</td>
<td>.625 x 2.187</td>
<td>.25 x 12 (6 x 305)</td>
<td>.50 (13)</td>
<td>2.00 (51)</td>
</tr>
<tr>
<td>48&quot; (1219)</td>
<td>.625 x 3.187</td>
<td>.25 x 12 (6 x 305)</td>
<td>.50 (13)</td>
<td>2.00 (51)</td>
</tr>
<tr>
<td>54-66&quot;</td>
<td>.625 x 3.187</td>
<td>.25 x 14 (6 x 356)</td>
<td>.50 (13)</td>
<td>2.00 (51)</td>
</tr>
</tbody>
</table>

4", 6", 8", 9", 10", 72" sizes available as non-AMCA licensed.

**Frame Materials**
- MOLDED FIBERGLASS CHANNEL (SEE CONSTRUCTION TABLE)
- ANGLE PIN STOPS (STD)
- FULL CIRCUMFERENCE BLADE STOP (OPT)

**Blade Seals (OPT)**
- NEOPRENE
- SILICONE
- EPDM
- VITON

**Shaft Seals (OPT)**
- INTEGRAL WITH BEARING
- AXLE SHAFT SEAL WITH OUTBOARD BEARING

**Accessories (OPT)**
- BOLT HOLES IN BOTH FLANGES
- MANUAL ACTUATOR
- ELECTRIC ACTUATOR
- PNEUMATIC ACTUATOR

*Available in non-AMCA rated damper only.

### Frame Orientation

<table>
<thead>
<tr>
<th>QTY.</th>
<th>FRAME</th>
<th>BOLT HOLE ORIENTATION</th>
<th>COMMENTS</th>
<th>TAG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D-DIA.</td>
<td>G Bolt Circle Diam.</td>
<td>H Holes</td>
<td>M Hole Diam.</td>
</tr>
</tbody>
</table>

**Model 914-817/Replaces Model 914-206**

ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION.

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MODEL 914 SUGGESTED SPECIFICATION

Suggested specification for Model 914 Ruskin Swartwout Fiberglass Series round dampers (revision 6394). Dampers shall be Ruskin Swartwout Series Model 914 FRP control dampers.

A. Damper frames
Dampers shall be constructed with premium vinyl ester resins suitable for specified contaminants. Vinyl ester construction shall be through out, both corrosion liner and structural layers laminated using specified vinyl ester resin. Polyester, vinyl ester combinations are not acceptable. Resins used shall carry a flame spread of 25 or less. Uses of flame retardant or fillers in the corrosion liners are not acceptable. Damper frame and flange face shall have an integral corrosion barrier not less than 100 mils thick, and utilize specified resin. Additional surfacing veil should be used if required to meet or exceed corrosion resistance requirements. Corrosion liner shall be free of any inclusions, translucent and meet or exceed ASTM C 582-87. Chemical resistance shall be performed to ASTM 581-87. Tests shall be performed by independent laboratories and results available for viewing upon request.

B. Corrosion liners and Structural layers
Structural layers will be applied only after exotherm is complete from corrosion liner and shall consist of alternating layers of 1.5 oz/ft². All entrapped air shall be removed in accordance with para. 6.3.4. of ASTM C 581-87. Glass to resin ratio shall be a minimum of 32-35 percent glass to a maximum of 65-67 percent resin. Structural layer of the web and flange shall be integral, secondary or cold wrapped flanges are unacceptable. Lamination of the structural layer and flanges shall not produce excessive shrink and or exotherm causing pre-release, or warpage to the flange face, or damper I.D. Flange face to face tolerance shall be no more than 1/16 of an inch, flange flatness (when measured on a flat surface) shall have no deviation, insuring proper bolt up to mating flanges. Post applied pan-finled gel coat will be standard.

C. Flanges
Flanges shall be routed to provide a concentric flange O.D. not to deviate from out of round no more than 1/8 of an inch. Damper frame shall meet 90% barcol of resin manufacturers requirements per ASTM D 2583.

D. Damper and Blade design
Damper design shall be of single blade construction and center pivoted. Blades shall utilize coring material of either balsa or synthetic type centered in blade laminate. Add on or external stiffeners are not acceptable. Coring and lamination schedule shall be designed to hold blade deflection to a minimum of L/360 on dampers with seals and L/180 on dampers without seals.

E. Axle and Bearings
A full length axle shall be permanently fastened to the blade centerline by using 316 grade stainless steel pins imbedded internally and not exposed to airstream contaminants, and located by means of the axle saddle integrally molded in the blade surface. Axle shall be supported on both the drive and non powered side of the damper by means of a graphite filled PTFE machined bearing. Bearing to be flanged one end eliminating blade side to side motion during rotation.

Bearing support area will be no less than 5/8” thick as measured on the damper centerline. Manufacturer certification of bearing material and machining will be available upon request. Axle will be constructed of a premium grade vinyl ester and conform to ASTM D 435-84a.

F. Blade Seals
Blade edge seals shall be of the “Double Tadpole” design. Seal to be mechanically fastened to the blade perimeter using FRP retainer and Isolast™ fasteners. Seal will be continuous and not break at axle. Blade seal will not be compressed against a blade stop. Blade seal will be of the wiper design not a compression type. Seal and cored blade combination installed in damper frame shall meet or exceed 2.90 cfm leakage @26” of static pressure with bearings installed both upstream and downstream. Damper assembly to be leak tested in both directions. Damper shall bear the AMCA label for Air Leakage in accordance to AMCA standard 511. Damper holding torque shall not exceed 4.64 inch pounds total per inch of blade circumference in the closed position.

G. Shaft Seals
If required, axle shaft seals will be of the spring loaded single lip, double lip or “O” ring type seal housed in an FRP composite retainer. The use of PVC, UHMW and other Thermoplastics are not acceptable. Seal type selection shall be based on application and material availability. Seal shall be easily maintainable and not hinder damper axle rotation. Each shaft diameters will have dedicated axle seal. Use of flat stock elastomers for axle seals are not acceptable. Hand actuation devices will be designed to provide access for seal inspection or replacement.

### LEAKAGE*

<table>
<thead>
<tr>
<th>Static Pressure (inches W.G.)</th>
<th>CFM/Sq. Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>26”</td>
<td>2.90</td>
</tr>
</tbody>
</table>

*Chart reflects results with damper bearings installed both upstream and downstream.

### PRESSURE LIMITATIONS

<table>
<thead>
<tr>
<th>Damper Dia.</th>
<th>Max. System Pressure</th>
<th>Max. System Velocity</th>
</tr>
</thead>
<tbody>
<tr>
<td>72” (1829)</td>
<td>30”</td>
<td>6000 fpm</td>
</tr>
<tr>
<td>60” (1524)</td>
<td>30”</td>
<td>6000 fpm</td>
</tr>
<tr>
<td>48” (1219)</td>
<td>30”</td>
<td>6000 fpm</td>
</tr>
<tr>
<td>36” (914)</td>
<td>30”</td>
<td>6000 fpm</td>
</tr>
<tr>
<td>24” (610)</td>
<td>30”</td>
<td>6000 fpm</td>
</tr>
<tr>
<td>12” (305)</td>
<td>30”</td>
<td>6000 fpm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Static Pressure (inches W.G.)</th>
<th>CFM/Sq. Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30”</td>
<td>4.5</td>
</tr>
</tbody>
</table>

*Chart reflects results with damper bearings installed upstream.
Model 914 Performance Data

Dampers may tolerate higher pressure and velocities than those indicated here. Conservative ratings are presented intentionally in an effort to avoid misapplication. Consult Ruskin or your Ruskin representative when damper is to be applied in conditions exceeding recommended maximums.

Performance curves based on AMCA Standard 500D. Air leakage is based on operation between 50°F to 104°F (10°C to 40°C). All data corrected to represent standard air density 0.075 lbs/ft³.

Data is based on a maximum seating torque of 4.64 inch-lbs per inch of blade circumference applied to hold the damper in the closed position.

Pressure drop and leakage information is for unit equipped with full circumference blade seal. Consult Ruskin for data when unit equipped with full circumference blade stop.

Ruskin Company certifies that the Model 914 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 Program. The AMCA International Certified Ratings Seal applies to Air Performance and Air Leakage.

<table>
<thead>
<tr>
<th>Damper Diameter Inches (mm)</th>
<th>1 in. W.G.</th>
<th>4 in. W.G.</th>
<th>8 in. W.G.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12” (305) through 66” (1676)</td>
<td>1A</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Class 1A = 3 CFM Sq. Ft. @ 1” w.g.

Class 1 =
4 CFM Sq. Ft. @ 1” w.g.
8 CFM Sq. Ft. @ 4” w.g.
11 CFM Sq. Ft. @ 8” w.g.

Model 914 Damper size 12” Dia. Velocity vs. Pressure Drop

Model 914 Damper size 24” Dia. Velocity vs. Pressure Drop

Model 914 Damper size 36” Dia. Velocity vs. Pressure Drop

AMCA FIGURE 5.3
From supply system and flow measuring section

Inlet cone req'd if attached to plenum

Damper being tested

AMCA STANDARD 500
FIGURE 5.3 DAMPER TEST SETUP WITH INLET AND OUTLET DUCTS

ALTERNATE MOUNT B (LEAKAGE TEST ONLY)
FIGURE 5.5 TEST DEVICE SETUP WITH INLET CHAMBER