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SECTION 23 33 00

ULTRA-LOW LEAKAGE CONTROL DAMPERS

Display hidden notes by using “Tools”/”Options”/”View”/”Hidden Text”

\*\* NOTE TO SPECIFIER \*\* This section is based on the products of Ruskin Company, which is located at:

 3900 Dr. Greaves Road

 Kansas City, Missouri 64030

 Tel: (816) 761-7476

 Fax: (816) 765-8955

 Email: ruskin@ruskin.com

 Web: <http://www.ruskin.com>

Ruskin Manufacturing has been the leading manufacturer of dampers and louvers for 50 years. Ruskin has pioneered advanced products for the HVAC Industry and continues to be an industry leader with modern manufacturing equipment, computer-aided design capabilities and an AMCA registered air performance testing laboratory for research and development. All of these are backed by our experienced engineers and professional staff and reflects Ruskin's commitment to high quality product standards.

Ruskin Industrial Dampers are designed to provide construction features that meet the needs of the customers, ambient to extreme temperatures, pressures and challenging atmospheres. Ruskin can provide ultra-low leakage, high temp and pressure relief dampers for process control. When required non-standard materials can be used to meet or exceed project requirements. Post applied coatings and finishes are also to be considered based on system conditions.

This section covers Ruskin Manufacturing high performance, ultra-low leakage, extruded aluminum control dampers suitable for application in HVAC systems with velocities to 6,000 feet per minute (1,829 m/min), Model CD50. Consult Ruskin for assistance in editing this section for specific applications.

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1. GENERAL
	1. SECTION INCLUDES
		1. High performance, ultra-low leakage, extruded aluminum control dampers suitable for application in HVAC systems with velocities to 6,000 feet per minute (1,829 m/min).
	2. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Edit the following list as required for the project. List other sections with work directly related to the dampers.

* + 1. Section 23 31 00 – HVAC Ducts and Casings.
		2. Section 23 09 00 – Instrumentation and Control for HVAC.
	1. REFERENCES
		1. AMCA 500-D – Laboratory Methods for Testing Dampers for Ratings
		2. AMCA 511 - Certified Ratings Program for Air Control Devices.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. ASGBC: U.S. Green Building Council LEED® Rating System
		2. ASHRAE RP1157 – Research project for determining damper placement and programming.
	1. DEFINITIONS

\*\* NOTE TO SPECIFIER \*\* Retain definitions remaining after this Section has been edited

* + 1. Damper Terminology: Definitions of terms for metal louvers contained in AMCA 500 apply to this Section unless otherwise defined in this Section or in referenced standards
		2. Horizontal Damper: Damper with horizontal blades; i.e., the axes of the blades are horizontal.
		3. Vertical Damper: Damper with vertical blades; i.e., the axes of the blades are vertical.
	1. ACTION SUBMITTALS
		1. Comply with requirements of Section 01 33 00 - Submittal Procedures.
		2. Product Data: Submit manufacturer's product data.
			1. Include leakage, pressure drop, maximum pressure data, and damper authority.
			2. Indicate materials, construction, dimensions, and installation details.
			3. Include damper pressure drop data for all damper sizes in accordance with AMCA 500-D test figure 5.3 (Duct Inlet, Duct Outlet).
			4. Indicate damper leakage meets AMCA Class 1A in accordance with AMCA 500-D.
			5. Indicate damper is licensed to bear the AMCA Certified Ratings Seal for Air Performance and Air Leakage.
			6. Damper to be tested specifically to project specifications in an AMCA approved laboratory when applicable.
			7. Include a copy of the installation instructions.
		3. Certifications: Manufacturer shall certify in writing that the damper capacity will withstand HVAC system operating conditions.
			1. Closed position: Maximum pressure of 13 inches w.g. (3.2 kPa) @ a 12 inch (305 mm) blade length.
			2. Open Position: Maximum air velocity of 6000 feet per minute (1829m/min).
		4. Product Schedule: For dampers. Use same designations indicated on drawings.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if not required.

* + 1. Samples: Submit sample of damper to show frame, blades, actuator, accessories, finish, and color.
	1. INFORMATIONAL SUBMITTALS

\*\* NOTE TO SPECIFIER \*\* Coordinate "Qualification Data" Paragraph below with qualification requirements in Division 01 Section "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

* + 1. Qualification Data: For manufacturer and Installer.
		2. Product Test Reports: For each type of damper, for tests performed by a qualified testing agency.

\*\* NOTE TO SPECIFIER \*\* Retain "Field quality-control reports" Paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + 1. Field quality-control reports.
		2. Sample Warranties: For manufacturer's warranties.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications
			1. The manufacturer shall have implemented the management of quality objectives, continual improvement, and monitoring of customer satisfaction to assure that customer needs and expectations are met.
			2. Manufacturer shall be International Organization for Standardization (ISO) 9001 accredited.

\*\* NOTE TO SPECIFIER \*\* Insert installer qualifications. Delete if not required.

* + 1. Installer Quallifications
			1. USGBC LEED Compliance: The work of this section shall be in accordance with applicable portions of the U.S. Green Building Council’s LEED Green Building Rating System. Refer to Divisions 23 and 26 Sections and other related documents bound herein for purposes of complying with this requirement.
		2. Product Qualifications
			1. Dampers to be tested in accordance to project specification or published data sheets. Test set up orientation to be per AMCA 500 D. Leakage and pressure drop will be recorded and submitted for review and acceptance.
			2. Dampers shall be licensed to bear the AMCA Certified Ratings Seal. Ratings based on tests and procedures performed in accordance with AMCA 511 and comply with AMCA Certified Ratings Program. AMCA Certified Ratings Seal applies to Air leakage and AIR Perfomance.
	1. DELIVERY, STORAGE, AND HANDLING
		1. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.
		2. Storage: Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions.
		3. Handling: Handle and lift dampers in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.
	2. WARRANTY
		1. Manufacturer shall provide standard limited warranty that product will be free from defects in material and workmanship for a period of 5 years (60 months) from date of delivery to the delivery location.. When notified in writing from the Owner of a manufacturing defect, manufacturer shall promptly correct deficiencies without direct financial cost to the Owner.
1. PRODUCTS
	1. MANUFACTURER
		1. Ruskin Manufacturing, 3900 Dr. Greaves Road, Kansas City, Missouri 64030. Phone (816) 761-7476. Fax (816) 765-8955. Web site http://www.ruskin.com.
		2. Substitutions: Not permitted.
		3. Requests for substitutions will be in accordance with provisions of Section 01600.
	2. ULTRA-LOW LEAKAGE CONTROL DAMPERS

\*\* NOTE TO SPECIFIER \*\* Consult Ruskin for assistance in selecting from options for specific applications.

* + 1. Model: CD450 as manufactured by Ruskin Company.
		2. Rating:
			1. Temperature Rating: Withstand -45 to 185 degrees F (-43 to 85 degrees C).
			2. Capacity: Damper shall withstand system operating conditions
				1. Closed Position: Maximum pressure of 13 inches w.g. (3.2 kPa) @ a 12 inches (305 mm) blade length.
				2. Open Position: Maximum air velocity of 6,000 feet per minute (1,829 m/min).
			3. Leakage: Maximum 5.2 cubic feet per minute per square foot (0.6 m3/min/m2) at 4 inches w.g. (1 kPa) for size 48 x 48 inches (1219 x 1219 mm)
			4. Pressure Drop: Maximum 0.03 inch w.g. (0.01 kPa) at 1,500 feet per minute (457 m/min) across 24 inch x 24 inch (610 x 610 mm) damper.
		3. Construction
			1. Frame: 4 inches x 1 inch x minimum 0.125 inch (127 x 25 x minimum 3.2 mm) 6063-T6 extruded aluminum channel with hat mounting flanges on both sides of the frame, reinforced at corners.

\*\* NOTE TO SPECIFIER \*\* Box or square type blades do not provide the same performance as true airfoil type. Box or square type blades can cause excessive turbulence and pressure drop.

* + - 1. Blades:
				1. Style: Airfoil-shaped, single-piece.

\*\* NOTE TO SPECIFIER \*\* Delete action not required.

* + - * 1. Action: Parallel.
				2. Action: Opposed.

\*\* NOTE TO SPECIFIER \*\* Delete orientation not required.

* + - * 1. Orientation: Horizontal.
				2. Orientation: Vertical with thrust washers.
				3. Material: Heavy duty 6063-T6 extruded aluminum.
				4. Width: Maximum 6 inches (152 mm).
			1. Bearings: Molded synthetic sleeve, turning in hole in frame.

\*\* NOTE TO SPECIFIER \*\* Santopreneblade edge seals offer the best leakage performance in the damper industry. Glue-on or clip-on seals can fall off the damper blade and frame, affecting the leakage rating and damper performance.

* + - 1. Seals:
				1. Blade: Extruded Santoprene type for ultra-low leakage from -45 to 185 degrees F (-43 to 85 degrees C). Mechanically attached to blade edge.
				2. Jamb: Extruded Santoprene finger type.

\*\* NOTE TO SPECIFIER \*\* Specify concealed linkage for lower pressure drop and low maintenance.

* + - 1. Linkage: Concealed in frame.
			2. Axles: Minimum ½ inch (13 mm) diameter plated steel, hex-shaped, mechanically attached to blade.

\*\* NOTE TO SPECIFIER \*\* Delete mounting not required.

* + - 1. Mounting: Vertical.
			2. Mounting: Horizontal.

\*\* NOTE TO SPECIFIER \*\* Standard finish is mill aluminum. Consult Ruskin for assistance in specifying special finishes for specific applications.

* + - 1. Finish: Mill.
	1. ACCESSORIES
		1. Actuator:
			1. Electric: 24V, 120V, two-position, 24 V modulating.

\*\* NOTE TO SPECIFIER \*\* Delete fail position not required.

* + - 1. Fail Position: Open.
			2. Fail Position: Closed.

\*\* NOTE TO SPECIFIER \*\* Delete mounting not required.

* + - 1. Mounting: External side plate.
			2. Mounting: External sleeve.

\*\* NOTE TO SPECIFIER \*\* Switch package indicates actual blade position, not actuator or control shaft position. Delete if not required.

* + 1. SP 100 Switch Package:
			1. Two position indicator switches linked directly to damper blade to remotely indicate damper blade position.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Flange Frame: 1-1/2 inches (38 mm), add on to frame.

\*\* NOTE TO SPECIFIER \*\* Delete location not required.

* + - 1. Location: Front
			2. Location: Rear
			3. Location: Double
		1. Factory Sleeve: Minimum 20 gage (1.0 mm) thickness, minimum 12 inches (305 mm) length.

\*\* NOTE TO SPECIFIER \*\* Delete duct transition not required.

* + 1. Duct Transition Connection: Round.
		2. Duct Transition Connection: Oval.
		3. Duct Transition Connection: Rectangular.
	1. SOURCE QUALITY CONTROL
		1. Factory Tests: Factory cycle damper [and actuator] assembly to assure proper operation.
1. EXECUTION
	1. EXAMINATION
		1. Inspect areas to receive dampers. Notify the Engineer of conditions that would adversely affect the installation or subsequent utilization of the dampers. Do not proceed with installation until unsatisfactory conditions are corrected.
	2. INSTALLATION
		1. Install dampers at locations indicated on the drawings and in accordance with manufacturer's installation instructions.
		2. Install dampers square and free from racking with blades orientation as scheduled or required.
		3. Do not compress or stretch damper frame into duct or opening.
		4. Handle damper using sleeve or frame. Do not lift damper using blades, actuator, or jackshaft.
		5. Install bracing for multiple section assemblies to support assembly weight and to hold against system pressure. Install bracing as needed.

END OF SECTION