

Commercial Control Damper

Installation, Operation and Maintenance Manual



RECEIVING/INSPECTION

Upon delivery, inspect for both noticeable and hidden damage. If damage is found, record all necessary information on bill of lading and file a claim with the final carrier. Check to be sure that entire order, including accessories or loose parts are accounted for.

STORAGE

Store shipment in a safe location away from construction traffic, material, etc., to prevent damage. Cover with plastic sheeting to protect from excessive moisture, dirt, and debris or store in an area protected from the elements.

INSTALLATION

Inspect for damage and corrosion prior to installation. Handle dampers by frame only. Do not lift by blades, linkage, axle, actuator, or jackshaft components. When handling multiple section assemblies, use sufficient support to evenly lift at each section mullion. Do not drop, drag, step on, or apply excessive bending, twisting, or racking. **Use operator shaft to cycle damper if no factory actuator was provided. Do not twist or turn damper blades to cycle damper.**

1. Inspect ductwork or opening where damper will be installed for any obstruction or irregularities that might interfere with blades or linkage rotation or actuator mounting. Duct opening should measure 1/4" (6) larger than damper dimension and should be straight and level. **Support ductwork in area of damper to prevent sagging due to damper weight.**
2. Determine proper location of extended shaft or jackshaft before installing the damper. A sticker on the damper face shows recommended extended shaft location. **Attach shaft on labeled side of damper and preferably to that blade.** Use the shaft support bracket with snap-on extended shaft. See figure #1. Shaft must be attached to a power blade. On parallel blade units, all blades are power blades. On opposed blade units, blade with sticker and every other blade from the sticker blade are power blades.
3. **Unless specifically designed and ordered for vertical blade application, damper must be mounted with blade axis horizontal.**
4. If no holes are present in frame, drill 1/4" (6) dia. holes at 6" (52) centers and fasten frames together with 1/4" 20 (6-.03) bolts and nuts #10 Tek screws, spot welds or steel rivets.
5. Use appropriate shims between damper frame and duct opening to prevent distortion of frame by fasteners holding it in place. Appropriately brace at every horizontal mullion and vertically brace at every 8 feet (2.4m) of damper width for strength. Dampers in high velocity systems (2000 fpm 10.2 m/s) require more bracing. **Note: Ruskin dampers are specifically designed and engineered for structural integrity based on model and conditions. Attachment, framing, mating flanges, and anchoring of damper assemblies into openings, ductwork, or walls is the responsibility of the installer. Design calculations for these retaining and supporting members should be determined by field engineers for that particular installation.**
6. If damper assembly is provided with unjoined jackshaft ends, drill two 1/4" (6) diameter holes and install roll pins as shown in figure #3. Completely drive roll pins through the jackshaft. Jackshaft may have been repositioned to prevent damage during shipment. To reposition, loosen bolts on crank arms, reposition clamps, and slide jackshaft to desired position. If damper actuator is to be mounted out of airstream, the jackshaft should extend through the jackshaft bearing assembly and approximately 6" (152) beyond the frame. Secure jackshafts in place with the clamps provided and retighten bolts on crank arms.
7. If applicable, link lower and upper jackshafts with the crossover bar through the ball joint on crank arm at each jackshaft. Locate crank arm close to jackshaft bearing assembly. See figure #2 and #3 for crossover bar connection.

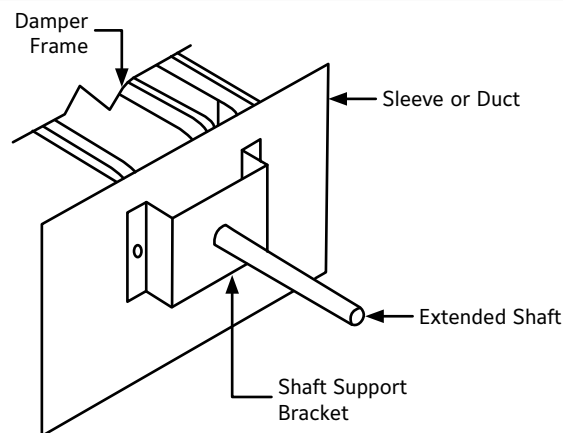


FIGURE 1

Note: Dimensions in parenthesis () indicate millimeters.

INSTALLATION

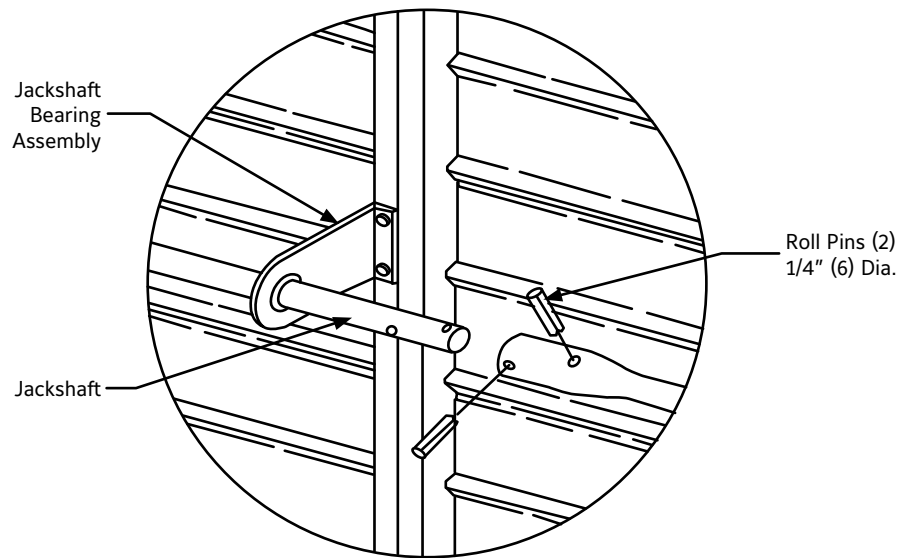
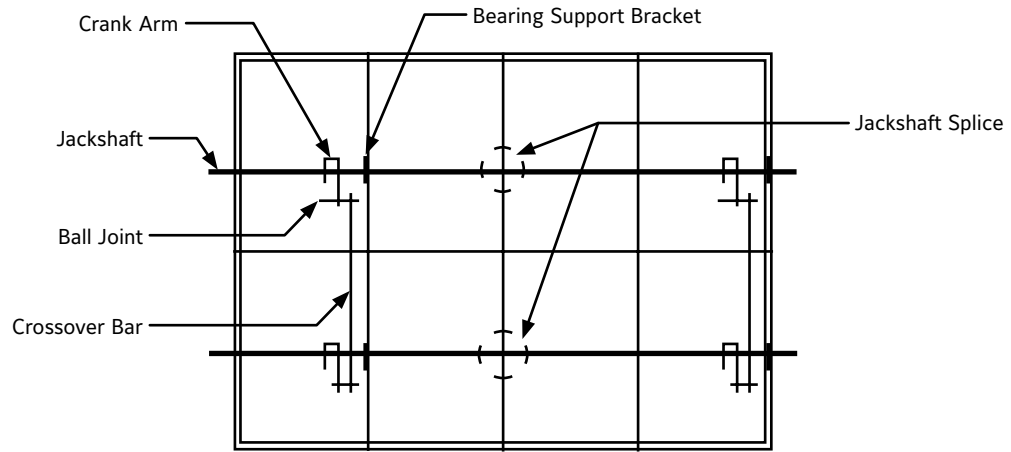


FIGURE 2

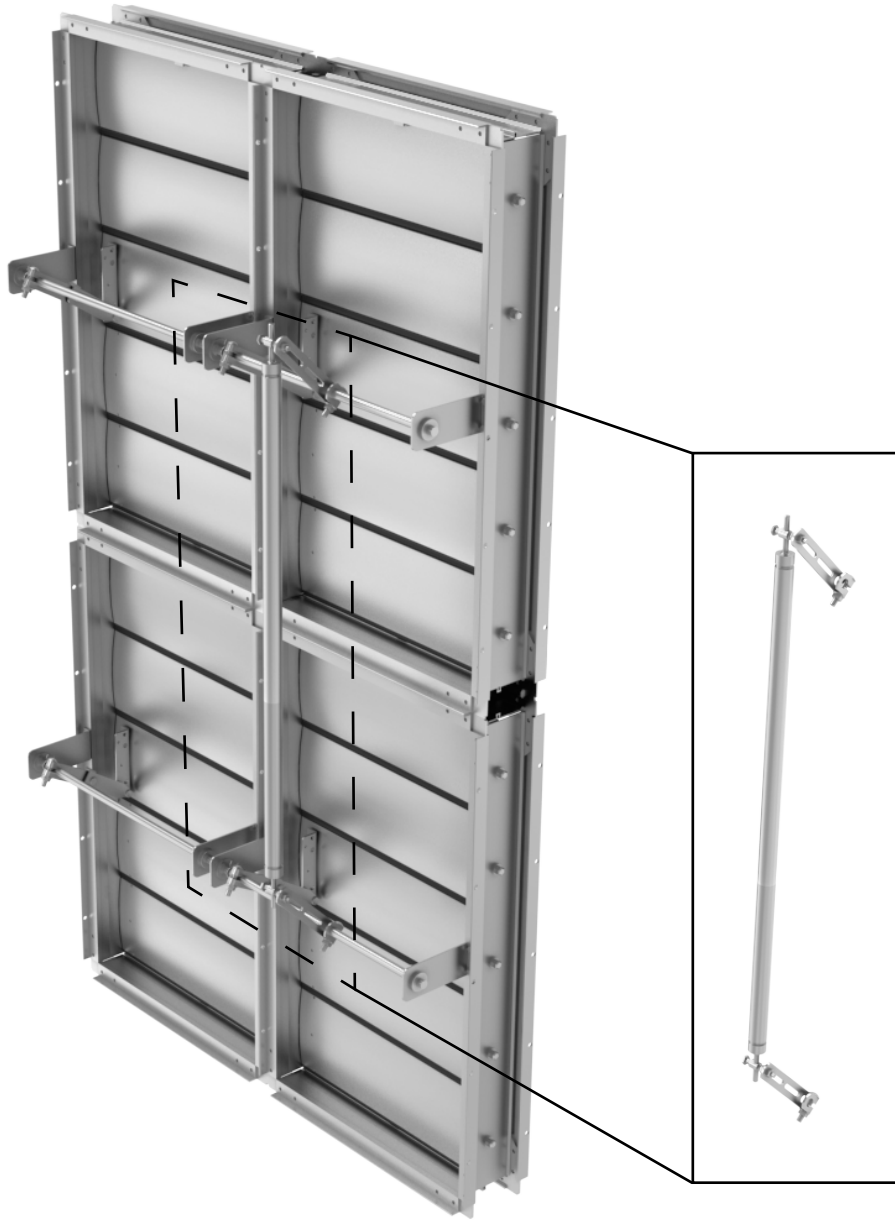


FIGURE 3

Note: Single crossover acceptable up to a maximum 60 sq/ft of damper assembly.

Important: Genset models CD60GS, CD50GS & TED50GS **DO NOT** use crossovers, all sections operate independently.

INSTALLATION GUIDELINES

INSTALLED IN DUCT (see figure #4)

- ▶ Damper must be installed square.
- ▶ Damper is manufactured so that finished O.D. is 1/4" (6.35 mm) smaller than opening width and height dimensions.
- ▶ Ensure that duct is square and/or large enough to allow damper to be installed square.
- ▶ Make hole in duct work, if required, to allow extension of shaft.
- ▶ Bottom of frame must sit flat on floor of duct to prevent twisting, sagging, or bowing, as this could cause leakage between bottom frame and bottom blade.
- ▶ Verify that damper is square, plumb, and level. Then secure bottom frame to floor of duct using a 90° mounting angle. Operate damper manually to confirm proper blade sealing.
- ▶ As each mounting angle is installed, verify operation to ensure damper blades are sealing correctly.
- ▶ 90° mounting angles are field-supplied.
- ▶ Caulk all connections/joints between damper frame and duct to minimize installation leakage.

FLANGED TO DUCT (see figure #5)

- ▶ Damper must be installed square.
- ▶ Front and rear damper flanges are 1 1/2" (38.1 mm) larger than duct or opening, around entire perimeter.
- ▶ Damper is manufactured so that finished O.D. is 3" (76.2 mm) greater than opening width and height dimensions.
- ▶ Do not assume that duct is square. Verify that duct flange is square, flat and even.
- ▶ Verify that damper is square, plumb, and level. Operate damper manually to verify free movement of blades and correct sealing.
- ▶ Fasten damper to duct. Re-verify that damper is square.
- ▶ Repeat procedure for other flange, if ducted on both sides.
- ▶ Caulk all connections/joints between damper frame and duct to minimize installation leakage.

REAR FLANGE MOUNTING (see figure #6)

- ▶ Damper must be installed square.
- ▶ Rear damper flange is 1 1/2" (38.1 mm) larger than duct or opening, around entire perimeter, providing a larger fastening surface.
- ▶ Front damper flange is 1 1/2" (38.1 mm) larger than duct or opening, around entire perimeter. **(Note that Rear Flange Install Type dampers are not designed so that the front of the damper may be inserted into an opening, as the side frame members extend to the full height of the rear flange.)**
- ▶ Damper is manufactured so that finished O.D. is 3" (76.2 mm) greater than opening width and height dimensions.
- ▶ Do not assume that opening is square. Verify that opening or duct flange is square, flat and even.
- ▶ Verify that damper is square, plumb, and level. Operate damper manually to verify free movement of blades and correct sealing.
- ▶ Fasten damper to opening surface or duct. Re-verify that damper is square.
- ▶ Repeat procedure for other flange, if ducted on both sides.
- ▶ Caulk all connections/joints between damper frame and opening or duct to minimize installation leakage.

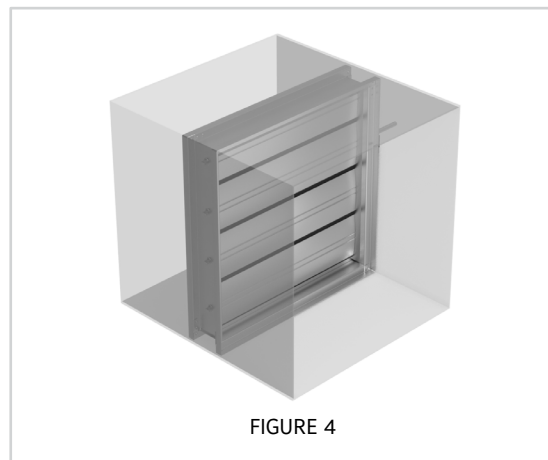


FIGURE 4

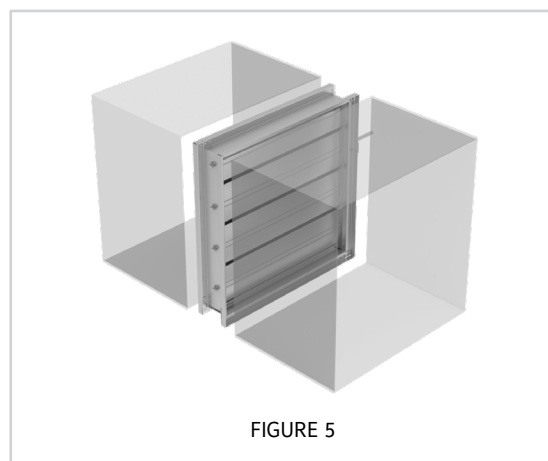


FIGURE 5

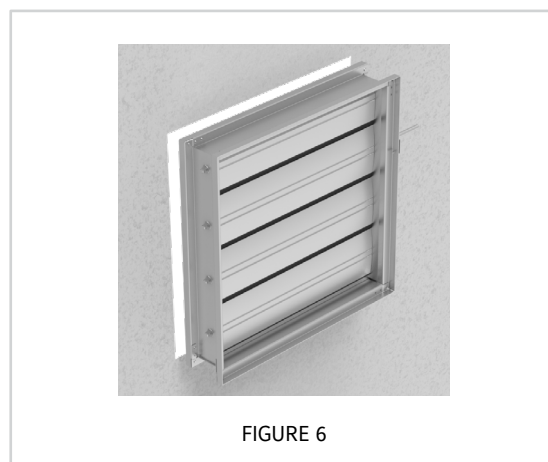


FIGURE 6

DAMPER MAINTENANCE

Ruskin's dampers are designed to be trouble free and hassle free under normal operation. Dampers are to be installed square and straight so as to prevent binding during operation. The following annual damper maintenance suggestions will help to ensure proper damper operation and increase the life expectancy of the damper.

Foreign Matter	Over the course of time, dirt and grime may collect on damper surfaces. The damper surfaces should be cleaned to prevent hindrance to airflow.
Moving Parts	Make sure that parts such as linkage, bearings, blades, etc. that are intended to move freely, can do so. Lubricating these components can prevent possible rusting and unnecessary friction increase. Use only a moli-spray oil or similar graphite based oil as regular lubricating oil will attract dirt. Bearings: Synthetic, oil impregnated, and ball bearings (without grease fittings) do not require lubrication. Ball bearings with grease fittings require only minimal grease.
Closure	Remove foreign materials that may be interfering with blade closure or effective sealing of the blades with each other or with the frame.
Operation	While operating the damper through its full cycle, check to see that the blades open and close properly. If there is a problem, check for loose linkage, especially at the actuator. Tighten the linkage where required.

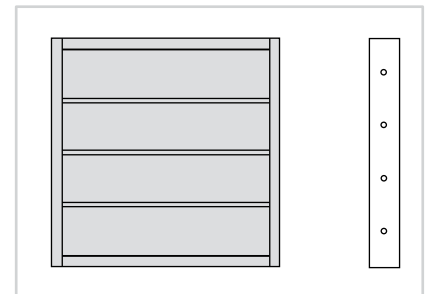
TROUBLESHOOTING

The following is a cause and correction list for common concerns with the dampers.

Symptom	Possible Cause	Corrective Action
Damper does not fully open and/or fully close	Frame is 'racked' causing blades to bind on jamb seals	Adjust frame such that it is square and plumb
	Actuator linkage loose	Close damper, disconnect power, adjust and tighten linkage
	Defective motor	Replace
	Screws in damper linkage	Locate screws and remove
	Actuator linkage hitting wall or floor	Damper installed too far into wall. Move out to line designated on damper label
Actuator runs hot or makes a humming noise	Contaminants on damper	Clean with a non oil-based solvent (see Damper Maintenance)
	Actuator prohibited from reaching end of stroke	Disconnect linkage from jackshaft, open damper, power actuator to end of spring, tighten linkage. Verify amp draw

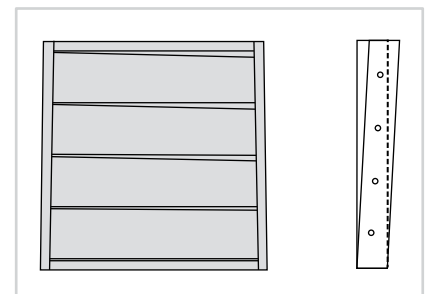
UNDER-OR OVER-ROTATION OF BLADES

- ▶ If light lines are present across the full length of the blade, check that closing torque being applied is neither too little nor too much.
- ▶ Under-rotation will not let blade gaskets compress, whereas over-rotation can cause blades to re-separate.



TWISTED FRAME

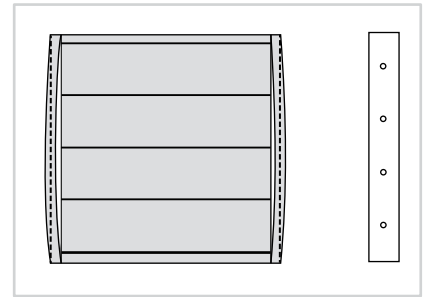
- ▶ If light lines are observed only along half of the blade length, square up the position of the top frame member, relative to the bottom frame, by pivoting the top frame member either in or out.
- ▶ A small movement in one of these two directions could seal light lines, by eliminating frame distortion caused by torque being applied to an unsecured damper.



TROUBLESHOOTING

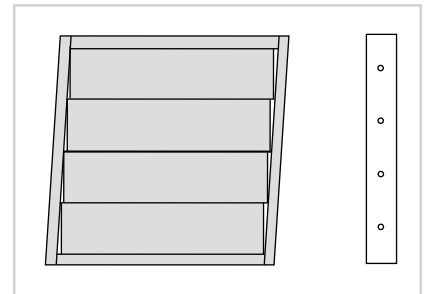
STRETCHED FRAME

- ▶ If light lines are observed between the side frame members and the blade ends of a damper, especially near the center line, verify measurements across the damper at the top, center, and bottom.
- ▶ If the measurements should vary by more than 3/16" (2 mm), readjust the side mounting angles to bring the side frame members to the correct dimension, thus matching top and bottom dimensions.
- ▶ If light lines disappear, ensure that these matching dimensions are retained when fastening mounting angles during installation.



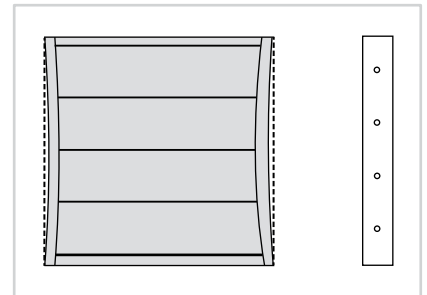
RACKED FRAME

- ▶ If light lines appear only near the top and bottom, on opposite sides of the damper, between the side frame members and the blade ends of a damper, verify square positioning with a tape measure and adjust if required.
- ▶ Move the top frame member either left or right to square up the damper. Light lines should disappear.



COMPRESSED FRAME

- ▶ If the damper is hard to operate by hand, verify that frame sides are not squeezed in or twisted.
- ▶ In either case, bearing life could be sharply reduced.
- ▶ Verify that frame sides are parallel by measuring across the damper at the top, center, and bottom.
- ▶ Also verify that dimensions on both sides of the damper are equal.



DISTORTED FRAME

- ▶ If light appears only between the last blade and the top or bottom of the damper frame, it may be due to the top or bottom frame member being distorted (twisted) when fastened to the duct work.
- ▶ Ensure that the top or bottom frame members are not distorted, by loosening fasteners and shimming the frame, if required.

