

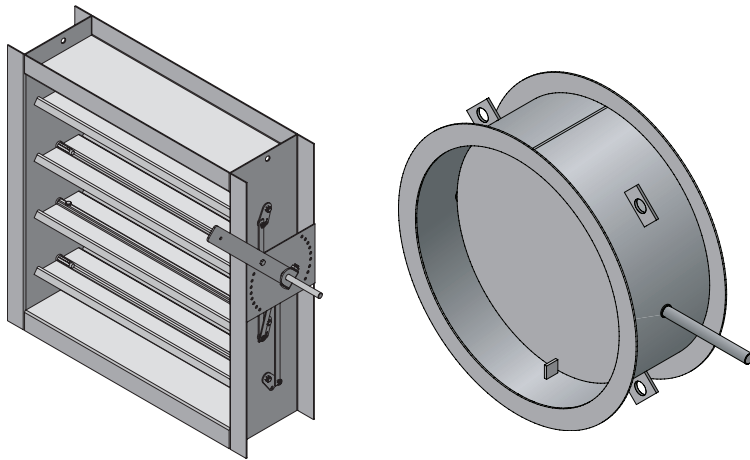
INDUSTRIAL AC SERIES DAMPERS

Preparation

Locate all crates, boxes, cartons, etc. associated with the order. Remove the damper from the packaging and inspect for damage. Confirm quantities and sizing with the packing list and the submittal drawings (if applicable). Also, if submittal drawings were included, review for associated tag numbers, location, and hardware item callouts. Notify your C&S representative immediately of any shortages or shipping damage.

Handling

The damper should only be lifted by the lifting holes provided in the frame on the damper assembly (see Figure 1 below). Never lift a damper by the blade(s), shaft, actuator, or any damper part. Lifting decisions must be left to trained personnel. Fork lift/crane capacity must be checked for sufficient lifting capacity. Care must be taken not to drop, drag, crush, or apply excessive bending, twisting, racking or skewing loads upon the damper frame, blade(s), linkage, or accessories. Painted dampers must be handled with extra care as even a small chipped spot will break the continuity of the coating and destroy its value as a protective covering of the metal.



General Information

C&S industrial dampers are designed for minimal pressure drop when in the open position and minimal air leakage when in the closed position. They are designed for industrial applications to provide seamless, problem free operation for the life of the product. Each damper is fully inspected by qualified factory personnel before shipping. When properly installed and maintained, the damper will be trouble free. Improper installation, adjustment, modifications, service, or maintenance can lead to property damage, injury, or death. Please read these instructions thoroughly before installing or servicing the damper.

Safety

The responsibility for providing proper guarding for C&S supplied equipment is that of the installer and user of the equipment as requirements will vary from one installation to the next. Dampers with powered actuators (electric or pneumatic) must be reviewed for safety guarding of the moving parts on the damper and the actuator itself. Where inlets and outlets are not ducted, screens are recommended. Users and installers of this equipment should carefully read all accompanying literature pertaining to safe operation for both the damper as well as the actuator. C&S dampers are designed to provide a long, trouble-free life, but do require maintenance and inspection as described in this manual.

When maintenance is required, it is critical that these safety precautions are followed:

1. Turn off/disconnect all electrical and/or pneumatic connections.
2. Lock out electric and/or pneumatics.
3. Block damper blade(s) to prevent movement.
4. Follow general safety precautions when removing heavy components.

Failure to follow these precautions could result in personal injury or damage to equipment.

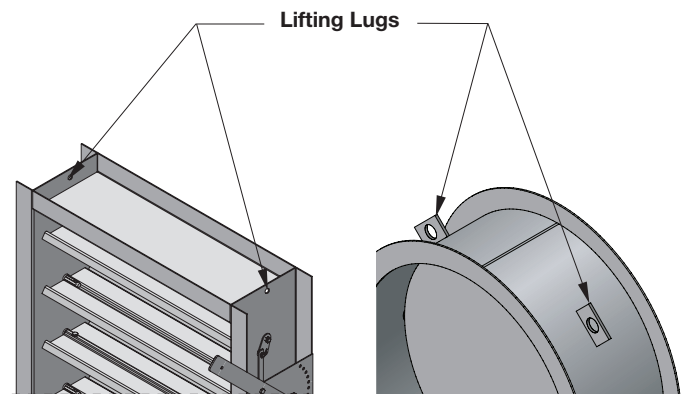


Figure 1

Storage

Dampers stored for any period of time before installation must be protected from sunlight, dirt, and moisture. Keep all conduit entry plugs and actuator access covers in place. Dampers should be stored on pallets and not directly on the ground or on concrete. Dampers may be stacked and stored horizontally with wood or equivalent spacers between flanges to allow air circulation. Do not allow damper to be supported by the blade(s) and never store with axles vertical. Dampers should be stored in a dry, clean area; long term outdoor storage is not recommended and could void the warranty. If the dampers are stored long term, please cycle the damper with actuator once per year, a minimum of ten (10) open/close cycles, to distribute grease in bearings and actuator. If the unit is supplied with an actuator, refer to the actuator installation manual for details on storage as well.

Installation

The goal of a proper installation is to secure the damper into the opening or duct in a way that prevents distortion of the damper. The following instructions will aid in completing the damper installation in a timely and effective manner. If possible, to protect from damage, leave the damper mounted on its skid/crate while moving to the installation location. Remove the skid, crate, and packing materials carefully. Check the opening or duct before installation to make sure it is free of obstructions and is square, straight, and level. Ductwork must be properly supported around damper to prevent sagging.

Single Section Dampers

If the damper is supplied without mounting holes, drill or punch as required. C&S is not responsible for corrosion around field punched or drilled holes on painted dampers. Unless specifically designed for vertical blades, the damper must be mounted with blade axis horizontal. Connect the damper to the mounting location using the proper hardware. Attach the damper to all connection points before tightening bolts. Confirm that the damper is square, straight, and level, and free from bending, twisting, or racking. Manually operate the damper to ensure that it operates freely.

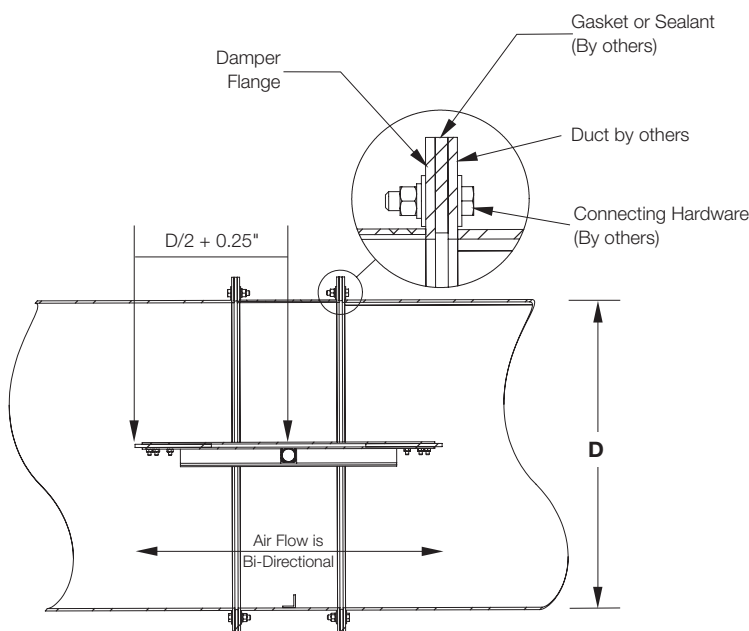
Round Dampers

For round dampers, use appropriate gasketing (supplied by others) between mating flanges. If the damper is supplied without mounting holes, drill or punch as required. C&S is not responsible for corrosion around field punch/drilled holes on painted dampers. Closed cell sponge rubber, solid rubber, maximum 60 durometer is recommended.

Allow minimum of half of the blade diameter upstream or downstream, plus 0.25" (6) for the blade seal material in the duct for blade rotation. The damper can be mounted vertically or horizontally as a long axle is parallel to the ground. Isolate damper from high vibratory loading. (See Figure 2)

Multi-Section Dampers

Follow instructions for single section dampers. Additionally, position damper sections together in opening or duct. Align and match frame markings on adjacent sections. Fasten adjacent sections together on front and back sides with screws or nuts and bolts. Shim damper frame and opening or duct as required to prevent distortion of frame. Multi-section dampers require bracing to support the weight of the assembly and to hold against system pressure. Bracing should support the damper horizontally, minimum 8 feet center-to-center. Large vertical assemblies and high system pressure may require additional bracing. All additional bracing and supports designed, supplied, and installed by others.



Duct Mount Installation
Industrial Round Damper Installation
Figure 2

Do's

DO use provided lifting lugs.

DO install bolts into all supplied mounting holes, then tighten in an even and staggered pattern to evenly compress the flange gasket (if using).

DO check that the mating flange is flat, square, and parallel to the damper flange.

DO check that damper blade(s) and linkages do not interfere with the mating opening or duct when the damper is cycled between open and closed positions.

Don'ts

DO NOT lift damper by blade(s).

DO NOT use actuator, linkage, or axles as lifting point.

DO NOT pry flanges to mate flange holes with opening or duct flange as the frame could become warped, twisted, bent, or pulled out-of-round causing binding.

DO NOT tighten mounting bolts by working around damper.

Please follow these instructions carefully. Failure to do so may void the warranty. If the unit is supplied with an actuator, refer to the actuator installation manual for details on the actuator before installation as well. If the actuators were factory installed some adjustment may be required after installation.

Start Up

Precautions should be taken before startup of the damper. All additional safety accessories should be installed before starting the damper to ensure the safety of everyone around. Rotate the blade(s) by hand to ensure free movement of all components. Remove any construction debris, loose hardware, tools, etc., from inside the damper and opening or duct.

If electrical power is required, check all electrical connections before turning on power. The supplied voltage must match the voltage required. A qualified electrician must be used. Improper connections are hazardous and can cause permanent damage to the electrical equipment. If any NEMA electrical enclosure is supplied, use appropriate electrical connections to maintain the NEMA rating. All wiring and fusing must be in accordance with national electric code, local code, and project specification requirements. If the unit is supplied with an actuator, refer to the actuator installation manual for details on the actuator before startup as well.

If pneumatic power is required, check all pneumatic connections. The supplied pressures must match the pressures required. A qualified technician must be used. Improper connections are hazardous and can cause permanent damage to the pneumatic equipment. All plumbing must be in accordance with national code, local code, and project specification requirements. If the unit is supplied with an actuator, refer to the actuator installation manual for details on the actuator before startup as well.

Industrial Damper

Installation, Operation, and Maintenance Manual

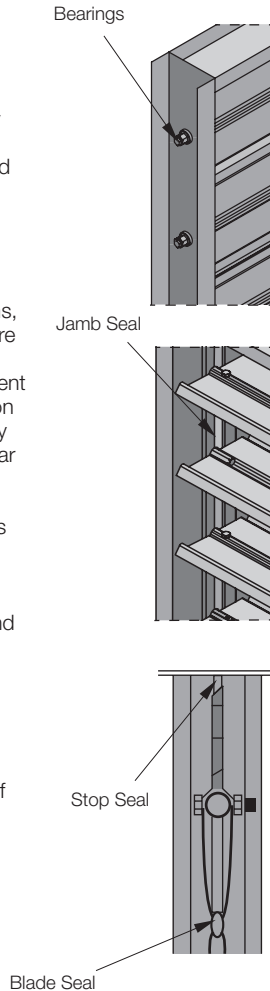
Maintenance

C&S dampers are designed to be maintenance free under normal operation. Dampers are to be installed square, level, and straight to prevent binding during operation. The following damper maintenance is suggested to help ensure proper operation and increase life expectancy of the damper. The frequency of maintenance should be determined by the severity of the application. Before performing maintenance ensure that the damper has been locked out. The blades should also be securely blocked to eliminate the potential for movement while maintaining.

Rectangular Dampers

1. Clean the dampers. Over time, dirt and grime may collect on damper surfaces. This can be a hindrance to airflow as well as reduce the sealing efficiency of the damper when closed. Be especially careful in cleaning non-metallic blade seals as they can be torn if abused. Mild soap and water is the recommended cleaning agent. Avoid abrasives and solvents as these could degrade seals, adhesives, oil on bearings, etc.
2. Check moving parts such as crank arms, linkages, pins, blades, etc., to make sure they move freely. While not required, lubricating these components can prevent possible rusting and unnecessary friction increase. Use only a molybdenum spray oil or similar graphite-based oil as regular lubricating oil will attract dirt.
3. The bearings located on the blade axles do not require lubrication.
4. If installed, inspect the blade seals and stop seals for damage such as tears and nicks. If damaged, replace as needed.
5. Check for worn shaft seals if applicable and repair or replace as necessary.
6. Look for debris that may be interfering with blade closure or effective sealing of the blades and remove.
7. Check for loose hardware.

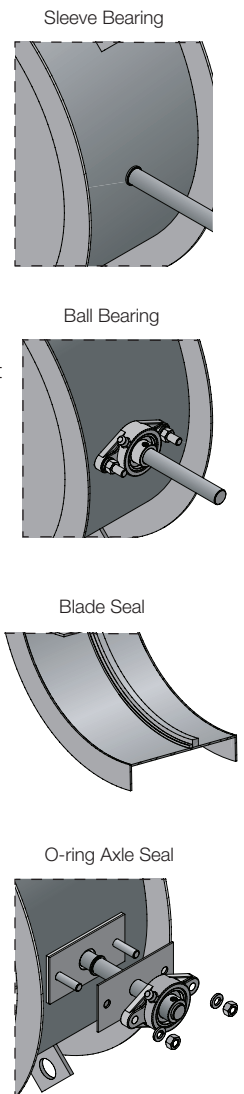
Refer to the actuator installation manual for details on the actuator maintenance requirements as well.



Round Dampers

1. Clean the dampers. Over time, dirt and grime may collect on damper surfaces. This can be a hindrance to airflow as well as reduce the sealing efficiency of the damper when closed. Be especially careful in cleaning non-metallic blade seals as they can be torn if abused. Mild soap and water is the recommended cleaning agent. Avoid abrasives and solvents as these could degrade seals, adhesives, oil on bearings, etc.
2. Check moving parts such as crank arms, linkages, pins, blades, etc., to make sure they move freely. While not required, lubricating these components can prevent possible rusting and unnecessary friction increase. Use only a molybdenum spray oil or similar graphite-based oil as regular lubricating oil will attract dirt.
3. If equipped, sleeve bearings located on the blade axle do not require lubrication. Ball bearings with grease fittings should be lubricated twice a year minimum with a NLG1 Grade 2 lithium 12-hydrostearate grease.
4. If installed, inspect the blade seals and/or axle o-rings for damage such as tears and nicks. If damaged, replace as needed.
5. Check for worn shaft seals if applicable and repair or replace as necessary.
6. Look for debris that may be interfering with blade closure or effective sealing of the blades and remove.
7. Check for loose hardware.

Refer to the actuator installation manual for details on the actuator maintenance requirements as well.



Industrial Damper

Installation, Operation, and Maintenance Manual

Troubleshooting

Manually operated damper blades not moving

1. Make sure the damper is free of obstructions.
2. Inspect damper for failed clevis pins, clevises, cams, link bars, or crank arms and replace as necessary.
3. Check that the damper is installed correctly as any twist or bend in the frame of the damper could prohibit smooth operation.

Actuator not responding

1. Electrical actuators: make sure the actuator is wired correctly and receiving correct voltage. Refer to the actuator installation manual for details on the actuator.
2. Pneumatic actuators: make sure the actuator is plumbed correctly and receiving correct air pressure. Refer to the actuator installation manual for details on the actuator.
3. If installed, check limit switches to make sure they are set correctly.
4. If equipped with a manual override, check operation of handwheel. Confirm that clutch is engaging and/or disengaging correctly.
5. Power actuator independently by loosening bolts that secure the actuator to the drive axle. Check to see that it operates properly and that the amp draw is normal.

Actuator is operating, but the blade(s) fail to move or only move limited distance.

1. Make sure the damper is free of obstructions.
2. Inspect damper for failed clevis pins, clevises, cams, link bars, or crank arms and replace as necessary.
3. Check that the damper is installed correctly as any twist or bend in the frame of the damper could prohibit smooth operation.
4. If installed, make sure that the limit switches in the actuator are set correctly.
5. Make sure that end travel screws of the actuator are set correctly.

High noise level

1. Check the airflow as high velocity/flow can cause excessive noise. Reduce flow through damper and check noise level.
2. Check the damper to make sure it is closed fully as partially open dampers can cause excessive noise. If it is, re-adjust to fully close damper.

Excessive leakage

1. Check the damper to make sure it is closed fully. If it is not, re-adjust the actuator or drive linkage to fully close damper.
2. Inspect blade seals and stop seals for tears or nicks. If they are damaged, replace damaged seals.
3. Check stops and perimeter frames for air passage. Caulk gaps with silicone sealant as required. Do not apply caulk to the jamb seals as these are flexible metal seals that have to be able to move to function properly.

For more information and troubleshooting for actuators, refer to the actuator installation manual.

Field Service

Installation, testing, inspecting, and commissioning the supplied dampers in the field is not part of C&S's scope. C&S is not responsible for, and will not perform, the work for electrical connections for field power, and will not perform work for connections for control system equipment and components. If field service such as startup assistance, troubleshooting, or repair are found to be an issue that requires factory support or warranty claims, please contact your C&S representative immediately.