The following installation instructions apply to the following NCA control damper models: ACD, OBD, PBD and SCD.

Application & General Notes:
These installation instructions apply to Control Dampers of the true round, opposed, parallel, single and multi-blade types most commonly installed in ductwork. The dampers are designed for operation in the vertical or horizontal orientation with blades running horizontal (please consult factory for vertical running blade options). Some damper models may have their own specialized installation instructions that supersede this IOM.

Safety Warning:
Read all installation, operating and maintenance instructions thoroughly before installing or servicing this equipment. Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death.

Receiving & Handling:
Check for damage when this product is received. If damage is found, record all necessary information on the bill of lading and file a claim with the final carrier. Check to be sure that all parts of the shipment are accounted for.

Electrical Guidelines:
Electrical input may be needed for products discussed within this IOM. All wiring shall be done in accordance with the latest edition of the National Electrical Code ANSI/NFPA-70, any local codes that may apply and wiring diagrams developed in compliance with the job or project design and specifications. Electrical input work should be performed by a qualified electrician. Verify power before wiring actuator. NCA is not responsible for damage to or failure of the unit caused by incorrect field wiring. Follow all instructions carefully.

Storage:
Store in a safe location away from construction traffic, material etc. to prevent damage. Cover with some sort of plastic cover in order to protect against excessive moisture, dirt and debris. Store in an area protected by the elements.

This IOM manual is the property of the owners, and is required for future maintenance. Please leave it with the owner when the job is complete.
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Pre-Installation Notes and Guidelines:
These notes and guidelines are formulated in order to aid in completing the damper installation in a timely and efficient manner.

A. Check the schedules for proper damper locations within the building.
B. Inspect damper for damage before installing.
C. Dampers must be installed free from twisting or racking.
D. DO NOT compress or stretch the damper into the opening.
E. DO NOT lift the damper by the blades or actuator (handle damper using frame or sleeve).
F. DO NOT install screws or fasteners in the damper that could potentially interfere with the unexposed blade linkage and prevent proper damper operation.
G. The damper and actuator must be protected from dirt, dust and foreign materials before and after installation.
H. When painting, wall-texturing, insulating or any other foreign material is being sprayed within 5 feet of the damper, the damper must be sufficiently covered and protected.

Maximum & Minimum Size Control Dampers:

<table>
<thead>
<tr>
<th>MODEL</th>
<th>MIN. SIZE</th>
<th>MAX. SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single Section</td>
</tr>
<tr>
<td>ACD-44</td>
<td>6x5 (152x127)</td>
<td>60x72 (1524x1829)</td>
</tr>
<tr>
<td>ACD-54</td>
<td>6x12 (152x305)</td>
<td>48x72 (1219x1829)</td>
</tr>
<tr>
<td>ACD-56</td>
<td>6x6 (152x152)</td>
<td></td>
</tr>
<tr>
<td>OBD-106</td>
<td>6&quot; Dia. (152)</td>
<td>36&quot; Dia. (914)</td>
</tr>
<tr>
<td>PBD-100</td>
<td>5x5 (127x127)</td>
<td>48x72 (1219x1829)</td>
</tr>
<tr>
<td>PBD-100RS¹</td>
<td>6&quot; Dia. (152)</td>
<td></td>
</tr>
<tr>
<td>SCD-57</td>
<td>5&quot; Dia. (102)</td>
<td>24&quot; Dia. (610)</td>
</tr>
</tbody>
</table>

¹Round Damper Models.
(All dimensions in parentheses () are in millimeters.)
General Installation Instructions

The following are general installation guidelines for NCA's control dampers. It is important to note that control damper materials, sizes and applications vary widely. Consult proper literature on each model for specific construction details.

1. Single section control dampers as well as multiple section control damper assemblies must be installed square and free from racking or twisting (see Figure 1). In order to ensure the damper is not racked, measurements AF should equal BE and measurements AB should equal CD in Figure 2 within a tolerance of 1/8” (1.5 mm).

2. Determine proper location of the extended shaft coupling or jackshaft before installing the damper (see Figure 3). Shaft must be attached to a power blade. On parallel blade units, all blades are power blades and on opposed blade units, every other blade is a power blade.

3. Multiple damper assemblies are not restricted to a maximum number of sections, but single section units are restricted to the maximum and minimum sizes in Table 1 on page 2 of this IOM.

4. Refer to the “Multiple Section Installation Guidelines” within this document for further guidance on multiple section dampers.

5. Use shims as needed between damper frame and duct opening or opening space to prevent the distortion of the frame by fasteners holding it place. Support braces should be used at every horizontal mullion (multiple section dampers) and vertically at every 8 feet (2.4 m) for strength.

Note: Dampers being installed in high velocity applications may require more bracing. Attachment, framing and anchoring of damper assemblies into openings, ductwork or walls/floors is the responsibility of the installer. These variables should be determined by field engineers for each specific installation.

6. When the actuator is being mounted outside the airstream, the shaft extension coupling will extend approximately 6” (152 mm) beyond the frame. When the unit is jackshafted, the jackshaft will also extend approximately 6” (152 mm) beyond the frame.

7. Damper blades, axles and linkages must operate proficiently without binding. Before system operation, all dampers should be cycled after installation to assure proper operation. When testing multiple section dampers, all individual sections should open and close simultaneously.

Note: Damper blades must always be running horizontally when installing the control damper in a vertical orientation. Consult the factory if a vertical damper with vertical blades is needed.
Multiple Section Control Dampers

Multiple Section Installation Guidelines

Dampers larger than the maximum single section size (see Table 1 on page 2) are manufactured in multiple section assemblies. These multiple section assemblies are connected with a jackshaft that runs parallel to the width of the damper.

1. Refer to the “General Installation Instructions” section on how to install NCA control dampers into a duct or an opening.

2. When individual damper sections need to be assembled together to make a multiple section unit, use the following fasteners:
   A. #10 x 3/4” (19mm) max sheet metal screws
   B. 1/4” (6mm) diameter nuts and bolts
   C. 1/4” tack or spot welds
   D. 3/16” (4mm) diameter steel pop rivets
   The above fasteners should be placed a maximum of 6” (152mm) on centers and a maximum of 2” (51mm) from corners. The approved fasteners should be on both faces of the damper sections.

3. Support braces should be used at every horizontal mullion (multiple section dampers) and vertically at every 8 feet (2.4 m) for strength.

4. Refer to Figure 4 on the orientation of the individual damper sections.

Actuator Connections

Electrical or pneumatic connections to damper actuators should be made in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations. Be sure to check actuator for proper voltage and current draw. Tampering with the actuator’s installation or connecting the actuator to an improper voltage and current may void the warranty.
The procedures discussed here are intended to ensure that nothing interferes with a damper’s proper operation and to identify and eliminate a number of potential situations that could occur and interfere with said operation.

**Control Damper Operation:**

All NCA control dampers are operated at the factory, however pre-installation testing of its operation should be conducted. Wire the actuator per correct wiring diagrams. to ensure proper actuator and damper operation.

**WARNING:** During any operating, inspection or testing of control dampers, NCA recommends the following:

1. Caution is advised when removing power from the damper’s actuator. Actuators may have very strong internal springs that may slam closed causing an abrupt interruption of airflow. As this could cause damage to ductwork, consideration should be given to conducting these tests without system airflow.

2. When checking damper operation, be sure to keep fingers, hands and any other body parts out of the blade travel path to prevent injury.

3. Check proper actuator operation. If defective, contact damper manufacturer for replacement procedures.

**Control Damper Testing:**

Testing of the damper and actuators prior to installation is imperative to ensure proper wiring and function of the damper. There are not periodic testing requirements for control dampers, however, consult the actuator’s manufacturer recommendations regarding periodic testing and maintenance.

**Control Damper Maintenance:**

Control dampers that are properly applied, appropriately installed, and demonstrated to function as intended through a building commissioning process should require no specific preventive maintenance. However, NCA recommends that obstructions, dirt build up, and any rust or corrosion be removed using mild solvents or detergents. No lubrication is required, however if it is desired, damper tracks and blade hinges may be lubricated using a dry lubricant. *Never use a petroleum based lubricant as it will attract dust and eventually impede a damper’s operation.*

**Message from NCA:**

This installation, operation and maintenance instruction document is intended to provide general instructions for multiple different NCA models of control dampers. Each specific application of control dampers may vary and may require other considerations when it comes to the installation, operation and maintenance of the damper.

As a part of NCA’s continuous improvement program, NCA reserves the right to make further improvements or changes without notice.