**Bowden Installation Instructions**

**Bowden Controllers/ Wire & Casing / B-Kits**

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### Step 1 Run Wire

1. Run the casing from the location where the controller will be to the damper.
   A. It should be as straight as practical and **Should be secured to the building structure at least every 5 feet.**
   B. Any turns should have at least a 3 foot radius in order to ease the inner wire through the turn.
   C. Limit cable length to no more than 50 feet. For a longer reach use Young Regulator Electronic Balancing Dampers.

2. Casing can be cut to length with a pair of wire cutters.

3. Feed the inner wire through the casing. It should slide easily.

4. Leave at least 3” of inner wire on each end.

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### Step 2 Assemble the 270 Controller

1. Rotate the control shaft counter-clockwise until the rack is in the full-up position. **Then return clockwise two clicks.**

2. Secure the outer casing in the casing clamp.

3. Install stainless inner-wire into the hole in the wire stop. The washer must be between the controller rack gear and the hole. (See Figure 3)

4. Tighten the screw until the wire starts to bend.

5. Install controller to termination using the mounting bracket nut.

6. Install the mounting bracket with the controller to a ceiling joist, plenum, diffuser or access panel.

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**Nomenclature**

- Controller
  - Bowden Casing & Wire
  - Casing Clamp
  - Wire Stop
  - Rack Gear
  - Pinion Gear
  - Mounting Bracket Nut
  - Mounting Bracket
  - Control Shaft

- Damper
  - Damper Shell
  - Angle Bracket
  - Shaft
  - Hub
  - Casing Coupling
  - Bowden Casing & Wire

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**Figure 1** 270-275 Termination

**Figure 2** 5020CC Damper

**Figure 3** Wire Stop Closeup

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**Damper Installation on Reverse**
Step 3 Connect the Damper

1. Slide angle bracket over the shaft.
2. Align the angle bracket perpendicular to the damper shell and fasten securely to the damper shell.
3. Slide the hub onto the shaft.
4. Rotate the shaft until the damper is fully closed.
5. Orient the hub so that it is 45° above the horizontal. (a little past 10:00 on a clock face) fasten the two set screws securely with a 1/8" allen wrench.
6. Install the casing coupling to the middle hole in the bottom of the angle bracket. Secure with the keps nut.
7. Slide the inner wire through the casing coupling then through the wire stop in the hub. Push the casing into the coupling until it bottoms out (approx. 0.5”). Tighten the thumb screw securely.
8. Thread the inner wire through the wire stop attached to the hub. (This is the same as on the controller without a washer.)
9. Confirm the Hub is positioned as shown in figure 4.
10. Tighten the wire stop on the hub.
11. Confirm proper operation of the damper by exercising the control from full open to full closed.

Installation Validation

1. Rotate the controller clockwise with the 030-12 wrench. It should move freely. If it is **Hard to turn?** - Check the path of the casing. Ease any turns, ensure it is not moving as the inner wire tries to move up and down.
2. When the controller is rotated full clockwise the damper should be full open. If it is **Not Fully Open?** - Adjust starting position of the hub. Release the inner wire and adjust the hub position on the shaft.
3. Cut off any excess inner wire.

### Ceiling Terminations

<table>
<thead>
<tr>
<th>Description</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>270-275 Rack and Pinion Controller w/angle bracket</td>
<td>Inside plenums, atop square diffusers, behind grille, above a drop ceiling or access panel</td>
</tr>
<tr>
<td>270-275 PH As above, adjusted with phillips head screwdriver</td>
<td>Inside plenums or above drop ceilings</td>
</tr>
<tr>
<td>270-275ML Angle bracket with extended control shaft</td>
<td>Inside plenums with Ice Tong style diffusers</td>
</tr>
<tr>
<td>270-301 Ceiling cup and 3” cover</td>
<td>Embedded in a Sheetrock ceiling</td>
</tr>
<tr>
<td>270-301BC As above, with bracket to fasten cup to stud</td>
<td>Embedded in a Sheetrock ceiling</td>
</tr>
<tr>
<td>270-301EZ Angle bracket and 3” cover plate</td>
<td>Above any ceiling</td>
</tr>
<tr>
<td>270-315 Cup and 2.25” threaded cap</td>
<td>Higher security cover</td>
</tr>
<tr>
<td>270-315BC Cup, 2.25” threaded cap &amp; 3” cover plate</td>
<td>Embedded in a Sheetrock ceiling</td>
</tr>
<tr>
<td>270-896 “C” bracket, screw cap 1” head</td>
<td>Embedded in a Sheetrock ceiling</td>
</tr>
<tr>
<td>4-Port Four Position Balancing Station</td>
<td>Bring all of the cables for an area to one place</td>
</tr>
</tbody>
</table>

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<tr>
<th>Description</th>
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<tbody>
<tr>
<td>270-302 Cup and Cover plate - wall mount</td>
<td>Embedded in a plastered wall</td>
</tr>
<tr>
<td>270-700 4x4 box with Stainless Cover and attractive adjustment knob</td>
<td>Wall mount “Manual Thermostat”</td>
</tr>
<tr>
<td>270-896LO “C” bracket, screw cap 1” head - Wall mount</td>
<td>Embedded in a plastered wall</td>
</tr>
</tbody>
</table>

### B-Kits

<table>
<thead>
<tr>
<th>Shaft Size</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>270-XXXB 1/2” round or 3/8” square shafts</td>
<td>Dampers by Others</td>
</tr>
<tr>
<td>270-XXXQ 5/16” round or 1/4” square shafts</td>
<td>Dampers by Others</td>
</tr>
</tbody>
</table>
**Wall Terminations**

**Bowden Cable Controls**

<table>
<thead>
<tr>
<th>Damper Family</th>
<th>Description</th>
<th>Direction of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5020CC</td>
<td>Round Exterior Bowden</td>
<td>Push to Close</td>
</tr>
<tr>
<td>5020CC2</td>
<td>Round Interior Bowden</td>
<td>Push to Open</td>
</tr>
<tr>
<td>820ACC</td>
<td>OBD Bottom mount Bowden</td>
<td>Push to Close</td>
</tr>
<tr>
<td>830ACC</td>
<td>OBD Exterior Shaft Bowden</td>
<td>Push to Close</td>
</tr>
</tbody>
</table>

**Bowden Cable Controls**

**Functional Drawing**

- 270-302 Wall Cup and Cover
- 270-896LO Wall Controller
- 270-301 Concealed Cup Room view w/o cover
- 270-700 “Manual Thermostat” with 5020CC