CS Bulletin – 14 January 2019
Complete AFPD Verification

To: Service Contractors responsible for PM Service and Repair

Subject: Verifying the operation of the AIRSYS Air Filter Protection Device (AFPD).

Related Products: All ASLLC Series Controllers (ASLLC.2, ASLLC.2.48, ASLLC.2A, ASLLC.2A.48)

Background: The AIRSYS AFPD senses dust or other particulates in the air and will automatically close the free cooling damper when the concentration reaches a preset amount. This bulletin provides instructions for verifying that the sensor is installed and operating correctly.

Instructions

Note: A source of particulates must be provided in order to verify system operation. Possible sources include canned smoke, cigarette smoke and dirt.

I.   Verifying AFPD Installation

Before verifying operation, verify that the AFPD has been installed at the site. An AFPD may not be installed on all units, but at least one **per controller** should be present. To access it, the front-bottom panel of the HVAC must be removed by taking off the four screws securing it. The AFPD is a white box that should be mounted below the filters. If it is not present in the first of a lead/lag pair then check the second unit. If neither unit has an AFPD mounted, then verification is not necessary.

II.   Changing the Damper Reset Delay

1. Press **Up** and **Down** together to return to the indoor temperature.

2. Press **Up** until $5\,\mathcal{C}\,t$ is displayed.

3. Press **Up** and **Sel** together, the screen should display $t\,E\,5$ (if unit off) or $5\,F\,t$ (if unit on). If this is not the case, return to step 1.

4. Press **Down** until $\mathcal{R}\,F\,d$ is displayed and press **Sel**. If this option is not available, proceed to **Section V**.
5. Press **Down** to change damper reset delay to **2**. This will allow the damper to reopen two minutes after the AFPD is triggered. This setting must be reset after testing is complete.

6. Press **Sel**, $\mathcal{R}\,F\,d$ should be displayed.

III. Verifying AFPD Operation (If Free Cooling is Active)

1. Free cooling operation can be verified in one of two ways:
   i. Shutting off the lights at the site and looking into the return (top) hole of the unit. If free cooling is active (damper is open), it should be possible to see indirect sunlight.
   ii. Looking above the filter and checking the damper position (see below for pictures).

Free Cooling Inactive (Vertical)

Free Cooling Active (Horizontal)

2. If free cooling is active, proceed to the next step, otherwise, go to **Section IV**.
3. Introduce a particulate source near the AFPD to simulate a protection event.

   Caution: When testing use short bursts/small amounts of smoke to avoid setting off fire suppression systems within the shelter. It is best practice to have the fire suppression system in bypass or test mode to avoid any chance of accidental discharge.

4. The dampers of the unit and any other units connected to the same controller should begin closing. If this is not the case, proceed to **Section V.**
5. Once all dampers on units connected to the same controller have closed, they should reopen after two minutes. Once this occurs, verification is complete, and the panels can be replaced on the unit.

IV. Verifying Free Cooling Operation (If Free Cooling is Inactive)

There are 5 conditions required for free cooling to occur:
   i. Outdoor Temp < Indoor Temp (default: minimum 3.6°F difference)
   ii. Outdoor Temp < Setpoint
   iii. Indoor Temp above economizer turn-on point (default: Setpoint -6°F)
   iv. Humidity below limit (default: 85%)
   v. Compressor is not running

Sensor calibration can be used to simulate these conditions. Follow the instructions below to access the necessary readings. Record these values and use them as a guideline for calibration.

1. Press **Up** and **Down** together to return to the indoor temperature. Record this value.

2. Press **Down** until HU is displayed. Press **Sel** and record the humidity value.

3. Press **Sel**, HU should be displayed.

4. Press **Down** until Et is displayed. Press **Sel** and record the outdoor temperature value.

5. Press **Sel**, Et should be displayed.

6. Press **Down** until SPt is displayed.

7. Press **Sel**, 5 ŁP should be displayed. Press **Sel** and record the main set point.
8. Press **Sel**, then press **Up** and **Down** together to return to the indoor temperature.

After the indoor temperature, outdoor temperature, and set point have been recorded, the sensors can be calibrated in order to fulfill conditions i-iv.

1. Press **Up** and **Down** together to return to the indoor temperature.

2. Press **Up** until 5 P Ł is displayed.

3. Press **Sel**, 5 Ł P should be displayed.

4. Press **Down** until n 2 A is displayed. Press **Up** or **Down** until the desired **indoor temperature** calibration is achieved, then press **Sel** to confirm. The calibration offset directly correlates to the temperature reading, meaning that an offset of +1.0 will increase the temperature reading by 1.0 °F/C depending on the temperature unit settings.

5. Press **Down** until n 2 P is displayed. Press **Up** or **Down** until the desired **outdoor temperature** calibration is achieved, then press **Sel** to confirm.

6. Press **Down** until n 2 L is displayed. Press **Up** or **Down** until the desired **indoor humidity** calibration is achieved, then press **Sel** to confirm.
7. Press **Up** and **Down** together to return to the indoor temperature.
8. Open the controller box and reset the **QF1** breaker.
9. If the calibrations have been done correctly, the damper will soon open. Free cooling operation can be verified in one of two ways:
   i. Shutting off the lights at the site and looking into the return (top) hole of the unit. If free cooling is active, it should be possible to see indirect sunlight.
   ii. Removing the front-middle panel and checking the damper position (see Section III for pictures).
10. If the conditions are satisfied and the damper is still not opening, proceed to **Section V**.
11. Go to the unit and use a particulate source to simulate a protection event.

    Caution: When testing use short bursts/small amounts of smoke to avoid setting off fire suppression systems within the shelter. It is best practice to have the fire suppression system in bypass or test mode to avoid any chance of accidental discharge.

12. The dampers of the unit and any other units connected to the same controller should begin closing. If this is not the case, proceed to **Section V**.
13. After two minutes, the damper should open. Repeat the steps in this section until correct behavior is verified for all units.
14. Proceed to **Section VI** once operation is verified.

V. Troubleshooting

Consult the AFPD manual (https://support.airsysnorthamerica.com/a/solutions/articles/6000190654) for instructions on hardware installation and software configuration. After correct hardware and software configuration are verified, retry the verification steps in **Sections II-IV**.

VI. IMPORTANT → Return Settings to Normal

Settings should be returned to normal after verifying AFPD operation.

1. Press **Up** and **Down** together to return to the indoor temperature.

2. Press **Up** until 5 ₽ ₺ is displayed.

3. Press **Up** and **Sel** together, the screen should display ₺ Ε 5 (if unit off) or 5 F ₺ (if unit on). If this is not the case, return to step 1.

4. Press **Down** until ₱ F ₫ is displayed and press **Sel**.
5. Press **Down** to change damper reset delay to **120**. This will allow the damper to reopen 120 minutes after the AFPD is triggered.

6. Press **Sel**, ₱ F ₫ should be displayed.
7. Press **Up** and **Down** together to return to the indoor temperature.

8. Press **Up** until 5 ₽ ₺ is displayed.

9. Press **Sel**, 5 ₺ ₽ should be displayed.

10. Press **Down** until ₥ ₫ ₱ is displayed. Press **Up** or **Down** until the calibration is either reset to 0 or the original value, then press **Sel** to confirm.

11. Press **Down** until ₥ ₫ ₱ is displayed. Press **Up** or **Down** until the calibration is either reset to 0 or the original value, then press **Sel** to confirm.

12. Press **Down** until ₥ ₫ ₺ is displayed. Press **Up** or **Down** until the calibration is either reset to 0 or the original value, then press **Sel** to confirm.
13. Press **Up** and **Down** together to return to the indoor temperature.