To prove that highly efficient filters do not negatively impact the heating and cooling system performance, the energy consumption was measured while different types of filters were tested. The energy consumption of the HVAC system will increase if the system is under stress. Three different types of filters were tested: fiberglass, 3M MERV 8, and 3M MPR 1900. The 3M filters were tested both clean and dirty to show that even when these filters are at end of life, the system will still not undergo any additional stress. The system was ran in a simulated heating season, with an outdoor temperature of 40.0°F, and in a cooling season, with an outdoor temperature of 95.0°F.

Due to the automation of the test design, filters were tested for various amounts of time. For this analysis, we choose to analysis only the first two hours of use. In Figure 1 (a – j) you will see the power cycles of the HVAC system over the first 7200 seconds as well as the corresponding filter pressure drop during that same time.