

## Health and Safety Monitor: ENGINEERING BASICS

### WHAT THIS DEVICE IS AND WHAT DOES:

The **HEALTH AND SAFETY MONITOR (HSM)** uses a control methodology to ensure optimum purge efficiency of an energy recovery wheel when installed to operate within a variable air volume system or constant volume, variable pressure system. By measuring the pressure differential across the purge section, air volume through the recovery wheel or both, the speed of the recovery wheel is modulated to ensure optimum purge efficiency as the airflow and thereby pressures through the system change. The resulting purge air flow at a preset, fixed purge angle is matched with a calculated wheel rotational speed to limit carryover of contaminants from the exhaust to the supply air stream while simultaneously maintaining the desired, high level of sensible and total recovery efficiency. The apparatus and control method also allows for seamless integration of temperature or enthalpy control to avoid over recovery, establish summer – winter changeover and avoid condensation/frost formation while still functioning as a purge optimization control method. It also allows for an alarm feature to guard against seal leakage in the incorrect direction (exhaust to supply), the ability to calculate and report airflow through the recovery wheel, the ability to calculate and accumulate energy savings, to report recovery efficiency and to automatically calculate the appropriate purge angle for the service technician during initial startup.

The HSM avoids the extreme contaminant carry-over levels experienced by variable volume systems when designed to include energy recovery wheels where the purge angle is chosen for the design, full flow, maximum purge pressure condition. It also avoids the excessive purge airflow, high parasitic fan energy and increased horsepower requirements associated with variable volume systems designed to include energy recovery wheels where the purge angle is chosen for the minimum flow, minimum purge pressure condition, as is the current practice for properly designed systems.

