Product Specifications – NES Series 9000 Garage Ventilation Controllers

Overview
The NES Series 9000 controllers integrate Carrier's® TruVu™ MPC Processor to provide multipurpose monitoring and control. Flexible and versatile, they support multiple input/output (I/O) configurations for accomplishing our custom garage ventilation control strategy, and they feature built-in routing and integration capabilities, along with support for up to nine (9) TruVu MPC I/O expansion modules and a total of 180 input/output points.

Each NES 9000 Series controller is customizable, providing optimum functionality and system features, including:

- √ **Tailorability** – Designable to meet a customer's specific ventilation control requirements. It can support up to 1,500 BACnet points and 200 Modbus points (e.g., gas sensors, variable frequency drives, I/Os).
- √ **Scalability –** Notably its ability to comport with Energy Management Systems (EMS) and Building Management Systems (BMS) programming protocols, as well as Internet accessibility and alarm alerts.
- √ **Capacity –** The built-in capability to interface with VFD technology for the purpose(s) of monitoring – in real time – and reporting on energy consumption/savings.

The NES 9000 Series design application is for enclosed garages with two (2) or more levels, and it can be configured to control a single ventilation zone or multiple zones, as well as multiple garage fan motors and VFDs.

The three versions of the NES Series 9000 controller are configured as follows:

- → **NES 9000:** Providing the TruVu twin network and i-Vu web appliance only.
- → **NES 9000X**: Providing the TruVu twin network with a panel-mounted, 10" touchscreen.
- → **NES 9000+**: Providing the TruVu twin network and i-Vu web appliance with a panel-mounted, 10" touchscreen.

Key Features:
- Surpasses strict code requirements for enclosed garage ventilation
- Optional panel-mounted, 10" touchscreen (NES 9000X and 9000+)
- BACnet MS/TP & BACnet/IP* compatible
- Modbus TCP/IP and DHCP compatible
- Local access 10/100 Ethernet port for system startup and troubleshooting
- Real-time clock keeps time in the event of power failure for up to 3 days without batteries
- Capable of system or stand-alone operation

System Benefits
- Fully plug-and-play with any building automation system

Physical
Fire-retardant plastic ABS, UL94-5VA

Compliance
United States of America: FCC compliant to Title CFR47, Chapter 1, Subchapter A, Part 15, Subpart B, Class A; UL listed to UL916, PAZX, Energy Management Equipment

Canada: Industry Canada Compliant, ICES-003, Class A; cUL listed UL 916, PAZX and Energy Management Equipment

Europe: EN50491-5-2:2009; Part 5-2: EMC requirements for HBES/BACS used in residential, commercial and light industry environment; EN50491-3:2009, Part 3: Electrical safety requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)

Real Time Clock
Real-time clock keeps track of time in the event of a power failure for up to 3 days

Environmental Operating Range
-40 to 158ºF (-40 to 70ºC) 10 to 95% RH, non-condensing

NES Sequence of Operation

- The NES system utilizes an innovative, smart-control logic that detects and measures vehicle fumes in the garage and then modulates garage fan speeds to prevent carbon monoxide (CO) and nitrogen dioxide (NO_2) levels from exceeding predefined set points (measured in parts per million) for an extended period of time.
- Our patented system incorporates variable frequency drive (VFD) technology, syncing it with our digital garage ventilation controllers and CO (and NO_2) sensors such that it:
    - Enables the motors to run continuously at low speeds – when CO (and NO_2) levels are de minimis – while adhering to code / design ventilation rate requirements;
    - Creates a reservoir of fresh air in the garage such that CO (and NO_2) concentrations are prevented from exceeding pre-defined sensor trip points for an extended period of time, thereby minimizing the number of times the motor(s) must ramp to “flush out” the garage; and finally
    - Incrementally increases fan motor speed(s), i.e., the ventilation rate, whenever CO (and/or NO_2) concentrations broach pre-set trip points. Said another way, the motors don’t instantaneously ramp from low to high speed(s) but rise proportionally (in speed) to counter CO (and NO_2) concentrations with an equivalent amount of fresh air.
- The result is to enable property owners to continuously ventilate their garages in an exceedingly energy efficient manner while ensuring the health and safety of building occupants and visitors.

For More Information Contact:

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