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## Orion - A Simple Solution to a Complex Alternative!

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In today's competitive environment, engineers, contractors, and owners are looking for advanced control for their packaged HVAC systems, but at what cost? Traditional building automation systems have become more advanced while at the same time becoming more complex. In most markets you're locked into one exclusive company to install and service your system, eliminating future competition that keeps service costs reasonable.

Building Automation Systems by nature are very flexible, but flexibility adds more expense due to programming requirements, engineering, and the need for specially trained installers. Is a sophisticated and complex control system really required for a building using packaged HVAC equipment?

There is another choice!

The Orion Control System provides you with advanced control features without complexity in an easy to install package that can be installed and serviced by a mechanical contractor!

Orion comes with comprehensive, easy to understand documentation designed for each controller and its applications. Because of these user friendly manuals, specialized training is not required for the installer or service technician.

The Orion controllers already contain the application programs for different requirements such as:

- Single Zone Constant Volume HVAC Controllers
- Multiple Zone Variable Air Volume HVAC Controllers
- Variable Air Volume Terminal Unit Controllers
- Voting Terminal Unit Controllers
- Make-Up Air HVAC Controllers
- Water Source Heat Pump HVAC Controllers

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## AAON® & Orion

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Orion unit controllers come factory mounted in your AAON® HVAC units. The contractor runs the wire to interconnect the controllers and then configures the system with menu driven, fill in the blank set-up tools or with a PC.

Unlike many building automation system programs, Orion programs have already gone through extensive field testing and are proven in reliability and operating efficiency for your AAON® equipment.

The Orion Control System was developed to work in concert with the AAON® line of Roof Top Units, Split Systems, Air Handlers, and Chillers. Orion's advanced control sequences allow you to take full advantage of the AAON® unit's unique features and capabilities. AAON® offers factory installation for all Orion unit controllers and provides you with a custom wiring diagram specific to each HVAC unit and its appropriate controller. Other units not provided by AAON® can be integrated into the Orion System with field installed controllers.

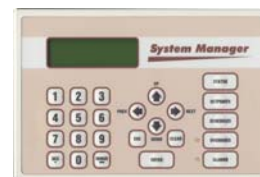
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## System Features

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The Orion Control Systems provide you with a broad range of features not found in even more costly and complex full building automation systems

- Application Specific Controllers
- Menu Driven Fill in the Blank Programming
- Comprehensive Easy to Understand Documentation
- Programming and Monitoring of HVAC Controllers Without a PC
- FREE Front End Software for your PC
- Remote Programming & Monitoring from a Remote PC Utilizing a Modem, Local Intranet or the Internet.
- Unique Modular Wiring Connections for VAV/Zone Controllers Reduces Wiring Time by Over 95%



## VCM Controller Features

The VCM Controller Board is designed with 7 analog inputs, 2 analog outputs and 5 relay outputs. The controllers input and output capabilities can be expanded by use of either 2 slot or 4 slot expansion boards that plug into the VCM Controller by means of a modular cable. The VCM Controller can be configured for control of VAV Units (with or without VAV/Zone Controllers), Constant Volume Units, Make-up Air Units and Air to Heat Pump units. Features include the following:

- Digital Compressor Control
- Return Air Bypass Control
- Advanced Dehumidification Capabilities
- Primary/Secondary Heating Control
- Up to a Combined Total of 20 Stages of Heating & Cooling
- Modulating Cooling Output (Digital Compressor or Chilled Water Valve Control)
- Modulating Heating Output (Hot Water Valve, Steam Valve, SCR Electric Heat Control)
- Configurable for Air to Air Heat Pump Applications
- Automatic Supply Air Reset
- Selectable Control Sensor
- Fan Proving Interlock
- Dirty Filter Alarm
- Smoke Detector Input
- Drybulb/Wetbulb Control of Economizer Operation
- Building Pressure Control
- Remote Override Capabilities
- I.A.Q. Economizer Reset
- 7 Day, 2 Event per Day Scheduling
- 14 Holiday Event Scheduling
- Optimal Start Scheduling
- Trend Logging Capability
- Static Pressure Control For Filter Loading Applications
- Accepts Remote HVAC Mode Selection Via Contact Closure On Expansion Input Board
- Full Integration with the AAON<sup>®</sup> MODGAS II Modulating Natural Gas Controller
- Full Integration with the AAON<sup>®</sup> MHGRV II Modulating Hot Gas Reheat Controller



Most common HVAC unit control applications can be configured using only the VCM Controller board. If the application requires more inputs and/or outputs than are available on the VCM Controller board, optional expansion boards are available to provide for additional analog, binary or digital inputs and outputs as required. These expansion boards are installed on either a 2 slot or 4 slot expansion base board that connects to the VCM Controller board via a modular cable connection.

The available expansion board configurations allow for (8) additional binary inputs, 4 additional analog inputs, 1 additional analog output, and up to 16 additional binary (relay) outputs. The various expansion boards connect to the 2 slot or 4 slot expansion base boards.

## VCM Controller Applications

### Variable Air Volume Unit Control

VAV units are typically designed for Occupied Cooling with Heating being used for Morning Warm-up purposes only. For this application the VCM is usually configured to control a VFD Supply Fan for Duct Static Pressure control. If the unit is not equipped with a VFD, but Duct Static Pressure control is needed, a Modulating Zoning Bypass Damper can be controlled by the VCM to maintain pressure control.

### Constant Air Volume Unit Control

The VCM can be configured to control a Constant Volume Supply Fan. In most cases, this is a very basic unit with just Space Temperature control. The VCM can also be used for kitchen, restaurant or lab environments that require 100% Outdoor Air part of the time and Return Air part of the time. The Hood On input allows the VCM to know when to switch to 100% Outdoor Air control based on its exhaust hood activation. For this application the VCM requires Outdoor and Indoor Air Temperature Sensors.

### Make-up Air Unit Control

The VCM can be configured for 100% Outdoor Air control for Make-up Air applications. All HVAC Modes of operation are determined based on the Outdoor Air temperature. The Outdoor Air volume must always be at least 50% of the total air volume or higher to be correctly configured for Outdoor Air control.

### Air to Air Heat Pump Unit Control

The VCM can be configured for Air to Air Heat Pump applications. In this application the compressors are used for both Heating and Cooling. The VCM controller activates the Reversing Valve during Heating operation by default as AAON units are built to fail to Cooling operation. If required the Reversing Valve can be configured to activate during Cooling operation for equipment that is built to fail to Heating operation.

