OPTO GENERIC DEVICES V-HVAC Inc.
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# Frequently Asked Questions

# FAQ's

## A1 Control Units

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## Q-1 *Who are OGD and V-HVAC?*

OGD (Opto Generic Devices, Inc.) is a research, development and manufacturing company dedicated to improving the control of rotating devices, machines and systems. OGD has been in continuous business operation in upstate NY near Cooperstown for some 17 years and has provided 100,000's of control devices for the office equipment industry. OGD developed and patented a new series of motion control solutions and products for the Heating, Ventilating, Air Conditioning & Refrigeration (HVAC&R) industry. Under its V-HVAC subsidiary OGD recently began production of a new line of products for AC fan motors that improves operation and saves energy: the A1 Motor Speed Control and HVAC System Control Units for small (<2 hp) motors are now available.

## Q-2 *Why do I need the A1 Control Unit and what are the benefits?*

At present most of the fan motors used to distribute air from heating or cooling systems to occupied spaces are at one of two fixed speeds - full ON or full OFF. A few of the newer HVAC&R systems do provide some limited variable speed control but at a much higher cost and at a higher level of complexity than can be justified.

The A1 Control Unit simply and very inexpensively gives AC motors improved speed control that can continuously adapt to user requirements. The result is that the motor and fan can be "Optically Programmed (OP)" to run at a speed determined by the heating or cooling available for delivery to the occupied space. If the HVAC system is not calling for added heat (or cool) the A1 can be configured to go into an energy saving "idle" mode of very low air movement, and minimal energy consumption. This provides more balanced air distribution with a more "gentle flow" of heating (or cooling) to the occupied space and helps eliminate hot and cold spots.

When the space calls for heat, but the temperature in the unit is still low, the A1 slowly increases air speed so that the still warming air is not introduced into the occupied space at a rate that feels too cool to the skin. This decreases complaints of cold drafts or stagnant air. Further, the way the A1 controls the speed of the motor, energy use is decreased by as much as 30%. The heating (and cooling) system in general works more efficiently, often saving fossil fuels as well as lowering equipment maintenance and replacement costs.

## Q-3 *How is the A1 Control Unit different from other Variable Speed Drives?*

The A1 is OGD's first HVAC&R production unit using optically based methods of motion control. The A1 is a low cost, basic version of OGD's motor speed control but it does not use digital or pulse switching methods (pwm) like many competing systems. Instead, it uses analog optical based control techniques.

Although it uses optical control devices, the A1 is not a full Optical Processing and Programming (OP) based system so it has some motor application limits. OGD's full function OP products can improve virtually any type of motor in any type of system, while the A1 is targeted at AC induction type motors in HVAC systems. Even so, the A1 has consistently demonstrated its ability to dramatically upgrade equipment and application operation, save huge amounts of energy, and improve motor function and longevity.

## Q-4 *Where will the A1 Control Unit (A1) be installed?*

Since the A1 is small, approximately 5 inches square by 4 inches high, installation inside the existing equipment cabinet, near the motor, is the preferred location. In the case of motors in tighter fitting equipment cabinets, the A1 can be mounted in a convenient location inside or outside the equipment. Unlike some competing motor controllers that cause severe equipment and motor havoc with longer power cables, the A1 does not. It also generates little or no EMI, RFI or other harmful noise effects that are detrimental to the power supply equipment and the power grid.

## Q-5 *How difficult is the A1 to install and who can install it?*

The installation procedure is very straightforward and not complicated. Anyone with limited knowledge of maintenance and basic electrical work should be able to install the unit in less than 20 minutes! OGD personnel will oversee the initial installation and can provide a simple installation procedure.

## Q-6 *What about ASHRAE Standards?*

The A1 complies with applicable ASHRAE Standards such as ASHRAE Recommended Dry Bulb Temps for Classrooms Table3; ASHRAE Recommended Sound Levels Table2 and many others. In addition, OGD's technology has not only been patented worldwide, it has also been studied, reviewed, validated and approved by many government agencies at both federal and state levels. In fact, in many cases when OGD's A1 unit is added to an HVAC application, ASHRAE Standards are more consistently adhered to versus an equivalent fixed speed unit.

## Q-7 *Does the A1 create any harmonic problems?*

It is the nature of some electronic devices to create harmonics, especially many of the motor controllers currently on the market. Although the A1 is the lower cost, basic OP model, it is still much improved over many competing units and creates significantly fewer harmonics than most other motor controllers (See Q-3 and Q-4 for more information).

## Q-8 *Will slowing the motor speed cause damage and overheating?*

Because of the advanced technology incorporated into the A1 controller (as described above), if installed in accordance with OGD guidelines (i.e. the motor was properly sized and installed prior to adding the A1), the motor will not overheat and will not be damaged.

## Q-9 *How does the AI Unit affect mechanically introduced Outside Air?*

Since the amount of outside air introduced into the occupied space is determined by a percentage of the total CFM the unit is delivering, simply adjusting the outside damper position in accordance with motor speed (CFM) maintains proper outside air percentages.

## Q10 *What happens to the room temperature in the occupied space?*

Space "climate conditioning" is actually improved significantly since the A1 dynamically and continuously adjusts or adapts the speed of the motor and the fan to the "available heating or cooling" in the unit. This avoids the bad effects of other fixed speed, as well as more expensive "pre-programmed" or pre-set variable speed units, that move the same amount (or rate) of air… whether it's 15 or 50 degrees outside. This can cause cold drafts or blasts of heat. The "intelligent & adaptive" A1 will efficiently provide just the right amount of heating or cooling to the occupied space at an air velocity that better matches the actual different air temperatures (outside versus inside). This assures the occupied space is "climate conditioned" and not just air-conditioned.

## Q11 *Will the A1 work with an existing control system?*

The simple analog based way the A1 functions allows it to be easily interfaced to most other control systems with little or no conflict (i.e. 0 to 10 vdc; 4 to 20 ma, etc). The A1 is capable of attaching to most existing systems and providing parallel control in a simple, adaptive way that can obviate the need for certain redundant, complex control systems. This is because the adaptive nature of the A1 also allows it to directly respond to "real world variables" – temperature, humidity, and airflow instead of just controller or computer programmed electric signals. So, the user and the installer have a choice as to their preference and application. Information gathered prior to installation of the A1 will be reviewed and evaluated with the customer to determine which control sequence(s) are advisable.

## Q12 *What if the A1 fails, or creates problems with the existing system?*

Again please note above FAQ's 3, 4, 5, 11 on the unique install and control options the A1 allows, which should improve performance and control. But, IF it does not "do", it can be easily "undone" as there is a bypass switch that can return the system to its pre-A1 state. This "failsafe" feature further elevates the powerful yet simple benefits of the low /no risk, retrofit /upgrade opportunity of OGD's A1!

## Q13 *What technical assistance is available from OGD?*

Given the easy, simple, failsafe nature of an A1 Control Unit, there is minimal need for complex or expensive training, staff, or instruction that is typically needed with many other variable speed units. Local, single-person contractors have successfully installed, retrofitted, serviced and maintained OGD's HVAC&R control units. But, OGD does also have an in-house staff of competent engineering and technical professionals for direct field support. Initial support will be provided as needed to insure that the unit is installed correctly and performs as intended, and post-installation support is available if needed.

## Q14 *Is the A1 Control Unit UL approved?*

The A1 Control Unit meets the electrical safety standards for the category of Industrial Control Equipment. The specific standards are: UL 508 for the United States and CAN/CSA-C22.2 Number 14-95 for Canada.