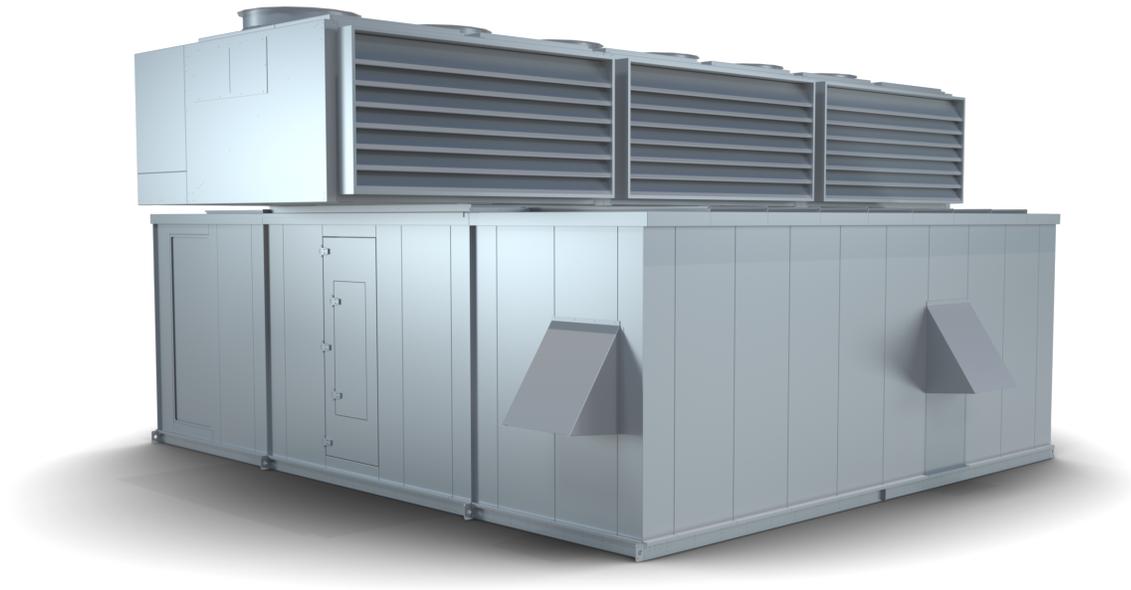


# GRW

*Precision Environmental Control Unit*



The SolutionAir GRW is a proven, trailblazing solution for precise dew point and temperature control, specifically engineered for the indoor horticultural market. This precision control unit supplies the environment with the necessary conditions for producing the largest crops at the lowest operating and life cycle costs, while helping to prevent the introduction of foreign contaminants and environmentally induced crop health issues.



### Low Ambient Cooling

GRW can provide full mechanical cooling and dehumidification in ambient temperatures as low as -40°C/F.

### Energy Savings

The ability to match high dehumidification demands in tandem with variable capacity control means that the GRW can efficiently remove moisture with lower airflow while maintaining the smallest required cooling capacity required to be effective.

### Reduced Life Cycle Costs

The GRW is designed to lower life cycle costs through its long lasting cabinet and components, reduced maintenance requirements, and lowered operating costs.

### Contamination Reduction

The GRW cabinet is designed to prevent biological contaminant growth within the unit by mitigating interior and exterior condensation with its patented double thermally broken wall construction.

### Precision Configurable Control

The GRW control system allows the unit to be tailored to your desired conditions and project needs. Sensible and/or dewpoint temperatures within the environment can be controlled to +/- 1°F.

## Typical Applications

GRW is specifically designed for indoor horticulture and is capable of providing precision dew point and temperature control to maximize crop yields.

### Construction Features

- + Advanced refrigeration monitoring
- + Compressor monitoring
- + Multiple independent circuits
- + Direct drive motors with monitoring
- + Modified fail safe operation
- + Extra capacity reheat

## Low Maintenance Construction

The GRW is designed with structural integrity in mind. SolutionAir uses quality components, corrosion resistant materials, corrosion, and innovative construction techniques to create a unit that will maintain its structural integrity for years to come.

## Marine Grade Aluminum Construction

The GRW cabinet is constructed with corrosion resistant aluminum, which will reflect over 70% of UV and infrared radiation. The unpainted material meets today's rigorous requirements for IAQ with no VOC gases being released from a coating system.

The lighter weight aluminum reduces support requirements, especially important for retrofit applications that may not have the ability to change building support structures.

## Unit Insulation

The GRW cabinet is insulated with flame-proof, water-proof stone wool insulation, meeting NFPA 90A (0/0) flame smoke rating standards.



## Fail Safe Operation

The GRW is designed with a combination of features and options to ensure continuous, effective operation:

- + Advanced Refrigeration Monitoring
  - The GRW monitors the refrigeration charge within it's circuits, detecting and reporting on an issue before it can affects equipment performance.
  - A compressor monitoring system detects anomalies in the refrigeration compressors, providing crucial performance feedback.
- + Redundant Components
  - Redundant safeguard features are incorporated into the unit design for unsurpassed reliable performance.
  - Multiple independent refrigeration circuits.
  - Multiple evaporators, each with independent electronic expansion valves.
  - Multiple condensers with separate condenser fans.
- + Component Monitoring
  - The direct drive motors are monitored for power consumption, which can flag potential issues before they can become a concern for future operation.
  - Optional blower motor and bearing temperature monitoring is available for added protection and fail-safe operation.
- + Modified Fail Safe Operation
  - In the unlikely event of a component failure, the GRW will automatically change operating parameters to optimally use it's the remaining functional components in order to meet the operating conditions.

## Variable Capacity Constant Load Operation

The GRW matches the exact dehumidification and cooling load profile required in the environment by using several key features:

### Full Variable Capacity Control

A combination of staged compressors and multiple variable capacity compressors provides full variable capacity for both dehumidification and cooling.

### Split Face Coils

By splitting the face of the cooling coils, and controlling them independently, the GRW from SolutionAir can operate its coils at reduced capacities improving part load control and efficiency.

### Variable Air Flow

The airflow can be modified over the cooling coils, either by direct airflow reduction, and or cooling coil bypass, to ensure that the cooling coils are always operating condition to match building loads.

### Extra Capacity Reheat

The GRW is designed with a high capacity hot gas reheat system, which when required can heat the controlled environment offsetting supplementary heating demand.



WHAT MAKES THE GRW THE BEST IN THE MARKET IS THAT IT'S THE ONLY PURPOSE BUILT UNIT FOR INDOOR CULTIVATION. EVERYTHING ELSE IS A MODIFICATION OF SOME OTHER TYPE OF UNIT. THE GRW ISN'T TRYING TO MAKE A DEHUMIDIFIER DO TWO THINGS, OR DESIGNED FOR SOMETHING ELSE THAT'S ESSENTIALLY A SQUARE PEG IN A ROUND HOLE.

Brian Zimmerman,  
PE, Impact Engineering, Inc.

### Energy Savings

- + **High Dehumidification Capacity:** The GRW can efficiently remove more moisture out of every cubic foot of air, reducing airflow and the associated operating costs as well as reducing the energy required for dehumidification.
- + **Variable Capacity:** This ensures no more capacity is operating than required.
- + **Highly Efficiency Direct Drive Blowers:** Blower energy use is reduced which also lowers energy transferred into the space.
- + **Separate Evaporator Coils and/or Coil Bypass Combined with Airflow Controls:** Reduces blower energy demands by optimizing cooling and supply airflow demand.

### Precision Control System

The GRW has a control system that allows the unit to be tailored to the project via:

- + Standard temperature and absolute humidity set points.
- + Scheduled temperature and absolute humidity set points, up to 8 programs per 24 hour period.
- + VPD operates the equipment to maintain a Vapor Pressure Deficit set point while not exceeding preset maximum and minimum temperatures or relative humidities.
- + Precise space temperature and dew point control to within +/- 1°F.

### Additional Options

- + **UVGI Lights:** Ultraviolet germicidal irradiation lights (UVGI) disinfect incoming air and surfaces of harmful micro-organisms, keeping the indoor environment cleaner and crops healthier. After a certain amount of exposure, bacteria and molds are neutralized.
- + **Variable Positive Pressurization:** A fan filter unit (FFU) provides variable positive pressurization to the unit cabinet and growing chamber. Positive pressurization forces air out of the pressurized zone through any small gaps or cracks. This creates an air barrier that blocks contaminated outside air from leaking into the room and introducing harmful bacteria, fungus and molds. The FFU is fitted with an ULPA filter that traps particulate up to 0.12 microns in size - small enough to filter harmful black mold spores.
- + **CO<sub>2</sub> Augmentation System:** The CO<sub>2</sub> augmentation system delivers calculated amounts of CO<sub>2</sub> to the supply air stream. The added CO<sub>2</sub> promotes crop growth and health by optimizing the air composition within the room.
- + **Emergency CO<sub>2</sub> Purge:** When CO<sub>2</sub> levels are measured to be dangerously high or low, the GRW unit will aid in purging the room of compromised air and bring in fresh, filtered air. This minimizes harm to crops by bringing the room back to safe CO<sub>2</sub> levels.
- + **Condensate Management System:** This option displaces condensate water from the drain pans to a desired location. This allows condensate to be sent to locations outside of the range of a gravity fed drain.

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