Greenhouse Control Systems

Greenhouse automation can occur from as simple of a setup as placing an inexpensive timer with a valve on your water supply or as complex as a unit that has multiple inputs and outputs, operating accessories such as heating and cooling systems, vents, fans, and irrigation, and receiving data from a weather station and/or various other sensors.

Simple Timer for Irrigation Systems

Rain Bird 1ZEHTMR: Electronic Garden Hose Watering Timer
When you only need to program the water on/off for a hose connection, a simple, inexpensive timer is all that is needed. This timer connects directly at the faucet to your hose and operates on two AA batteries. It only controls one zone (wherever the hose leads) and allows for up to two start times for each day of the week with manual watering and temporary shutoff controls.

More Advanced Timer for Irrigation Systems

Rain Bird ESP4ME3: Indoor/Outdoor 120V Irrigation Controller
When you need to control an irrigation system with multiple zones using electronic solenoids, and you’re not controlling any other devices, a dedicated irrigation controller should fulfill your needs. This timer plugs into a wall outlet and independently controls up to four zones with the unit itself, or up to 22 zones through expansion modules. Each zone can have up to six start times and durations for each time. To prevent watering when it rains, a rain sensor can also be added. Manual on/off overrides are also included.

Full Greenhouse Control

Link4 iGrow 800 Greenhouse Controller System
When your greenhouse control needs go beyond just watering, a more advanced control system is needed. The iGrow 800 Greenhouse Controller System has eight built-in outputs (expandable to 32) with manual overrides, eight analog inputs and two digital inputs. Data can be analyzed on a PC and settings can be controlled via Wi-Fi on your smartphone. When controlling a wide array of devices, managing wires, transformers and relays can quickly become unwieldy and potentially unsafe. Incorporating an integrated relay contactor panel contains all the wiring connections in a water-tight compartment with direct connection to the iGrow 800.

Professional Greenhouse Control

Link4 iGrow 1800 Greenhouse Controller System
When you require the maximum amount of control for your greenhouse or the iGrow 800 has an inadequate number of inputs or outputs, a professional series greenhouse controller is needed. The iGrow 1800 Greenhouse Controller System has 12 built-in outputs (expandable to 144) with manual overrides, eight analog inputs and 11 digital inputs. The iGrow 1800 enables you to control certain devices and systems that the iGrow 800 does not support, such as the iDoser and Vapor Pressure Deficit Irrigation. Just like the iGrow 800, an integrated relay contactor panel centralizes all of the wiring connections into one organized, water-tight compartment and be connected to a PC or be controlled via Wi-Fi on your smartphone.
The Logic Behind Link4 Greenhouse Controllers

Though Link4 Greenhouse Controllers are sophisticated devices that greatly reduce the manual intervention in controlling greenhouse devices, the logic behind them is pretty simple. They essentially take inputs, either programmed directly into the device, or delivered through a sensor, and when a condition is met, such as temperature, instruct devices to turn on or off. (i.e. open the ridge vent when the temperature rises above 78°). The controllers are low-voltage devices that send signals over low-voltage wires to relays, which are essentially switches, that allow high voltage to flow to the device. When a second condition is met, such as temperature or time interval, the controller closes the relay, halting the electricity flow to the device. The exception to this logic are low-voltage devices, such as irrigation solenoids. With these devices the controller is wired directly to the solenoid, eliminating the need for a relay.

Typical Inputs (Link4 Sensors)
- Advanced Digital Integrated Sensor Module
- Weather Station
- Anemometer
- Solar Light Sensor
- 100 Series Temperature Probe
- EC/Temperature Sensor
- pH Sensor
- Digital Temperature and Humidity Sensor
- Digital Integrated Sensor Module
- Room Pressure Sensor
- Quantum (Par) Light Sensor

Typical Outputs (Third Party Devices)
- Circulation Fans
- Exhaust Fans
- Foggers/Humidifiers with or without oscillators
- Heaters
- Evaporative Coolers
- Ridge Vents
- Eave Vents
- Misting Irrigation System
- Drip Irrigation System
- Grow Lights
- Motorized Shades or Blinds

Integrated Relay Contactor Panel

Link4 offers an excellent solution to safely organize and contain all of the wiring connections in a greenhouse in one watertight container. The Integrated Relay Contactor Panel is a hinged box that directly integrates the iGrow 800 or 1800 controller with all of the necessary relays that control all of the devices in the greenhouse (except low-voltage devices). This unit requires only one 110V power source that will power the controller as well as all the devices. The panel includes a receptacle for the controller, cooling fan, relays, and punch outs for water-tight conduit fittings. The panel also allows for the inclusion of Expansion Modules. Because each device draws specific amperage, the correct relays need to be installed to properly service each device. Link4 offers several standard configurations or a Link4 representative can custom-tailor the panel, based on the electrical requirements for all of the devices in the greenhouse. When this service is selected, the panel is delivered pre-wired and tested, ensuring a worry-free installation; only the power source and lines to each device need to be connected.
Typical Greenhouse Control System Diagram

Equipment shown may vary based on greenhouse design. Some accessories may require independent power supplies.

- Weather Station (Monitors and reports outside conditions only)
- Digital Temperature & Humidity Sensor (Monitors and reports inside conditions only)
- WindowMaster Chain Actuator (Awning window/cold frame control)

Power Source: 110V AC

- Only one power source is required to run multiple devices

- Tubular Motor for Shades
- Motorized Intake Louvre
- Exhaust Fan
- Eave Vent Linear Actuator
- Exhaust Fan
- Eave Vent Linear Actuator

Variable Speed Controllers
- This configuration allows you to independently control the speed of each fan or turn off power

Circulation Fans

Variable Speed Controllers

Low voltage devices do not need relays and can connect directly to controller

- Two-Stage Evaporative Cooler
- Drip System Solenoid
- Water Supply
- Misting System Solenoid

Expansion Module
- Installed Inside Panel

Expansion Module

24V DC connected directly to controller

Inside Temp. & Humidity Data

Light, Wind Speed, Wind Direction, Outside Temp., & Rain Data

Integrated Relay Contactor Panel

Power to Controller

24V DC

STAGE 1

STAGE 2

12V DC

24V AC/DC

110V AC

Water Supply

Grow Lights

Water Supply

Grow Lights

Only one power source is required to run multiple devices

This configuration oscillates fogger as it runs

One output can control multiple lights; all will turn on/off at the same time

Water Supply

Grow Lights

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**Greenhouse Accessories (Inputs/Link4 Sensors)**

**WEATHER STATIONS**
For reading of outdoor weather conditions only, the Link4 Weather Station is specially designed for iGrow controllers. It measures light, wind speed, wind direction, outside temperature, humidity, and rain data. The Weather Station is protected against solar radiation and reflected heat, and detects minute changes in the weather and relays that information to the iGrow controller. Its 12V wiring is configured to perfectly marry to the inputs within the controller.

**DIGITAL TEMPERATURE & HUMIDITY SENSORS**
This indoor digital sensor integrates temperature and humidity into one single chip sensor. Constructed with a protective shield that safeguards against radiation and reflected heat, the Digital Temperature & Humidity Sensor offers high precision for relative humidity and temperature readings. The unit has no moving parts (which often get damaged), keeps power consumption low, gives fast response times of less than 4 seconds, and reports accurate readings. Its 12V wiring is configured to perfectly marry to the inputs within the controller. Note: There are two sensor models, each respectively designed for the iGrow 800 and iGrow 1800.

**ADVANCED DIGITAL INTEGRATED SENSOR MODULES (ADISM)**
The ADISM indoor sensor gives you monitoring control with a differential pressure to provide accurate readings for temperature, humidity, CO2, and solar light. Its intuitive programming allows for easy setup and day-to-day use. Compatible with Link4's iGrow 1800 Series controller, the ADISM is a powerful companion tool to monitor and control a greenhouse.

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Operating Range</th>
<th>Operating Temp</th>
<th>Span Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>0.01°C</td>
<td>0.3°C</td>
<td>-40° to 254.9° F</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Humidity</td>
<td>0.05%RH</td>
<td>0.3°C</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>CO2</td>
<td>—</td>
<td>100 PPM, 5% of measuring value</td>
<td>1 to 10,000 PPM</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Light</td>
<td>—</td>
<td>—</td>
<td>Upto -2000 W/m²</td>
<td>-40° to 257° F</td>
<td>—</td>
</tr>
<tr>
<td>Differential Pressure</td>
<td>—</td>
<td>—</td>
<td>-125 Pa to +125 PA, 0.5 in</td>
<td>—</td>
<td>3% of reading</td>
</tr>
</tbody>
</table>

**ANEMOMETERS**
This wind speed and wind direction system is strong enough to withstand hurricane-force winds, yet sensitive enough to detect the lightest breeze. Hand-balanced for optimal stability and accuracy, this precision instrument is sealed with stainless steel ball bearings for a long life.
1000 SERIES TEMPERATURE PROBES
These stainless-steel Temperature Probes are specially designed to work with iGrow 1800 Controllers. Whether you are measuring bottom heat, a mixing valve system, soil temperature, or any other zone, these durable probes will do the job. The iGrow1800 Controller can use up to five Temperature Probes in addition to indoor and outdoor Temperature Sensors. These rugged sensors are conveniently small so, they can be placed almost anywhere in your greenhouse.

EC/TEMPERATURE SENSORS
In any hydroponic grow system, the health of your solution determines the health of your plants. EC sensor monitors your solution’s electrical conductivity and sends out a signal if there is a potential problem. It works with the Link4 iDoser. It also has a convenient and portable design with smart sensors that simplify calibration.

<table>
<thead>
<tr>
<th>Reference Solution</th>
<th>Junction Number</th>
<th>Junction Material</th>
<th>Body Material</th>
<th>Temp. Range</th>
<th>Strain Relief</th>
<th>BNC Boot</th>
<th>Bulb Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 M KCl/AgCl/KNO₃</td>
<td>Double</td>
<td>Pellon</td>
<td>Ultem</td>
<td>32° to 176° F</td>
<td>No</td>
<td>Yes</td>
<td>Teeth</td>
</tr>
</tbody>
</table>

PH FLAT-TIP SENSORS
Link4’s pH Sensor helps you accurately keep track of pH levels, constantly analyzing for changes that could affect yield. Plus, it easily interfaces with the Link4 iDoser for simplicity of use. The durable body is guaranteed to last for up to a year with a low-maintenance sealed gel design to prevent contamination.

DIGITAL INTEGRATED SENSOR MODULES (DISM)
The (DISM) sensor provides sensing for CO2, temperature, humidity, and light to get the most out of greenhouse operation.

ROOM PRESSURE SENSORS
The Room Pressure Sensor provides monitoring and controlling of the positive pressure cooling system in a greenhouse.
QUANTUM (PAR) LIGHT SENSORS

The Par Light Sensor records the exact amount of light plants are getting. Calibrated for sunlight, this self-powered sensor measures Photosynthetic Photon Flux Density (PPFD). Its quantum sensors can also measure Photo-synthetically Active Radiation (PAR) in an aquaponics setup. Its rugged and self-cleaning design makes it a reliable and long-lasting solution.

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Calibration Factor</th>
<th>Calibration Uncertainty</th>
<th>Calibrated Output Range</th>
<th>Measurement Repeatability</th>
<th>Non-Stability</th>
<th>Non-Linearity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 mV per µmol m-2 s-1</td>
<td>5 µmol m-2 s-1 per mV</td>
<td>± 5%</td>
<td>0 to 800 mV</td>
<td>&lt; 0.5%</td>
<td>&lt; 2 %/year</td>
<td>&lt; 1 %</td>
</tr>
</tbody>
</table>

**Sensitivity Calibration Factor**

<table>
<thead>
<tr>
<th>Calibration</th>
<th>Uncertainty</th>
<th>Output Range</th>
<th>Repeatability</th>
<th>Non-Stability</th>
<th>Non-Linearity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibration</td>
<td>Uncertainty</td>
<td>Output Range</td>
<td>Repeatability</td>
<td>Non-Stability</td>
<td>Non-Linearity</td>
</tr>
<tr>
<td>Calibration</td>
<td>Uncertainty</td>
<td>Output Range</td>
<td>Repeatability</td>
<td>Non-Stability</td>
<td>Non-Linearity</td>
</tr>
</tbody>
</table>

- **Calibration**: 5 mV per µmol m-2 s-1 per mV
- **Uncertainty**: ± 5%
- **Output Range**: 0 to 800 mV
- **Repeatability**: < 0.5%
- **Non-Stability**: < 2 %/year
- **Non-Linearity**: < 1 %


- **Response Time**: < 1 ms
- **Field of View**: 180°
- **Spectral Range**: 410 nm to 655 nm
- **Spectral Sensitivity**: < 10% from 469 to 653 nm
- **Directional Response**: ± 5% at 75° zenith angle
- **Temp. Response**: 0.06 ± 0.06% per C
- **Operating Environment**: -40° to 158° F, 0 to 100% humidity

Greenhouse Accessories (Outputs)

**CIRCULATION FANS**

Circulation Fans eliminates stagnant air, which breeds diseases, while also reducing the spread of fungi and pests. Moist leaves combined with warm temperatures will promote disease growth. They help dry plants quicker and reduce pests. A Circulation Fan can also help eliminate pockets of hot and cold air in a greenhouse. Two fans are typically used in a greenhouse and placed in opposite corners.

**FEATURES**

- Fully enclosed motors
- Hanging mount
- Framework built for greenhouses & high moisture environments
- Optional variable speed controllers
- White frame

<table>
<thead>
<tr>
<th>Model</th>
<th>Diameter</th>
<th>Performance</th>
<th>Weight (lbs.)</th>
<th>Volts</th>
<th>Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>VK8</td>
<td>8”</td>
<td>448 CFM*</td>
<td>8</td>
<td>115</td>
<td>0.6</td>
</tr>
<tr>
<td>VK12</td>
<td>12”</td>
<td>1,554 CFM</td>
<td>18</td>
<td>115/230</td>
<td>1.3/0.65</td>
</tr>
<tr>
<td>VK20</td>
<td>20”</td>
<td>4,000-4,800 CFM</td>
<td>37</td>
<td>115/230</td>
<td>3.8/1.9</td>
</tr>
<tr>
<td>VK24</td>
<td>24”</td>
<td>5,000-6,000 CFM</td>
<td>46</td>
<td>115/230</td>
<td>4.8/2.4</td>
</tr>
<tr>
<td>SI Dram</td>
<td>24”</td>
<td>5,000-6,000 CFM</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

* Cubic feet per minute

**VARIABLE SPEED CONTROLLERS**

An in-line variable speed controller allows the user to control the speed in which a circulation fan operates from 1% to 100% with the option of manually turning the fan off, overriding any control system.

<table>
<thead>
<tr>
<th>Model</th>
<th>Phase</th>
<th>Dimensions (LxWxH)</th>
<th>Weight (lbs.)</th>
<th>Volts</th>
<th>Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>H115</td>
<td>1</td>
<td>6¾” x 3” x 3¼”</td>
<td>1</td>
<td>115</td>
<td>6</td>
</tr>
</tbody>
</table>

**WINDOWMASTER CHAIN ACTUATORS**

WindowMaster Chain Actuators are capable of lifting up to 450 pounds and can be synced with other WindowMaster actuators. They offer the highest moisture resistance and can automated with rain or temperature sensors. The actuators can be set to open from 1” to 10” in ⅜” increments. This unit operates at 24 V DC and is connected directly to the iGrow Controller, bypassing the Contactor Panel.

<table>
<thead>
<tr>
<th>Size (W x H x D)</th>
<th>Weight</th>
<th>Min. Window Width</th>
<th>Min. Window Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>13½” x 13½” x 1¾”</td>
<td>2.2 lbs.</td>
<td>14¾”</td>
<td>15¾”</td>
</tr>
</tbody>
</table>

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**LINEAR ACTUATORS**
These durable motors can be paired with rain and temperature sensors for automated operation. They are designed to open vents that span multiple bays and are used in both ridge and eave configurations.

These actuators require two dedicated outputs when connected to an iGrow controller — one to open, and one to close the actuator.

<table>
<thead>
<tr>
<th>Horsepower</th>
<th>Volts</th>
<th>Amps</th>
<th>Full Load Thrust</th>
<th>Pin to Pin Retracted Length</th>
<th>Stroke Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/10</td>
<td>115</td>
<td>1.15 no load/1.40 full load</td>
<td>600 lbs.</td>
<td>17½”</td>
<td>7” to 12”</td>
</tr>
</tbody>
</table>

**IRRIGATION SYSTEM SOLENOID VALVES**
These electric valves open and close via a 24 V AC connection. They come in ¼” and 1” NPT fitting sizes. They are connected directly to the iGrow Controller, bypassing the Contactor Panel.
FULL-SPECTRUM LED LIGHT
A Full-Spectrum LED Light delivers a highly efficient 330 watts and covers a 3’ x 5’ area for vegetation and 2’ x 4’ area for flowers. They are dimmable with an optional controller and can operate in wet environments.

<table>
<thead>
<tr>
<th>Volts</th>
<th>Amps</th>
<th>Watts</th>
</tr>
</thead>
<tbody>
<tr>
<td>277</td>
<td>1.2</td>
<td>330</td>
</tr>
</tbody>
</table>

METAL HALIDE LIGHT
A metal halide grow light emits more light in the blue wavelength spectrum to promote vegetative plant growth. Plants grown under this type of light are typically taller and bushier.

<table>
<thead>
<tr>
<th>Volts</th>
<th>Amps</th>
<th>Watts</th>
</tr>
</thead>
<tbody>
<tr>
<td>120/240</td>
<td>3.0/1.5</td>
<td>315</td>
</tr>
</tbody>
</table>

TUBULAR MOTORS FOR SHADES
Tubular motors are designed to expand and retract roller shades as well as gravity fed (Roman) shades. One motor can simultaneously operate multiple shades for each bay or one shade over multiple bays.

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Min. Width</th>
<th>Max. Width</th>
<th>Volts</th>
<th>Amps</th>
<th>RPM</th>
<th>Lift</th>
<th>Lift Speed</th>
<th>Turns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.81&quot;</td>
<td>18&quot;</td>
<td>120&quot;†</td>
<td>120</td>
<td>1.7</td>
<td>30</td>
<td>88 lbs.</td>
<td>3.2 sec./ft.</td>
<td>21 to 32*</td>
</tr>
</tbody>
</table>

* Available with a 230 V motor.
† The width may exceed 120” with the implementation of an intermediate bracket and roller assembly, but the weight limit remains at 88 lbs.

MOTORIZED INTAKE LOUVRES
Motorized Intake Louvres work in conjunction with Exhaust Fans so that each will operate simultaneously, drawing fresh outside air in the structure while stagnant air is exhausted out. The shutters are constructed of exterior-grade PVC.

<table>
<thead>
<tr>
<th>Model</th>
<th>Rough-In Dimensions</th>
<th>Weight</th>
<th>Opening Area</th>
<th>Volts</th>
<th>Amps</th>
<th>CFM* (@0.05&quot;)</th>
<th>CFM* Range (Free Air)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIT-1200</td>
<td>12½” x 12½”</td>
<td>7 lbs.</td>
<td>1 sq. ft.</td>
<td>115</td>
<td>0.5</td>
<td>800</td>
<td>&lt;1,000</td>
</tr>
<tr>
<td>MIT-1600</td>
<td>16½” x 16½”</td>
<td>8 lbs.</td>
<td>1.77 sq. ft.</td>
<td>115</td>
<td>0.5</td>
<td>1,420</td>
<td>1,001 to 2,500</td>
</tr>
<tr>
<td>MIT-2200</td>
<td>22¾” x 22¾”</td>
<td>12 lbs.</td>
<td>3.36 sq. ft.</td>
<td>115</td>
<td>0.5</td>
<td>2,690</td>
<td>2,501 to 5,000</td>
</tr>
</tbody>
</table>

*Cubic feet per minute

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EXHAUST FANS
Exhaust fans pull hot air out of a structure and prevent it from becoming trapped at the ridge. They help circulate air within a structure and maintain a constant temperature. They are constructed with a PVC shell and should be placed on the opposing side of the structure from the intake louvre.

<table>
<thead>
<tr>
<th>Model</th>
<th>Diameter</th>
<th>HP</th>
<th>RPM</th>
<th>Performance</th>
<th>Motorized intake pairing</th>
<th>Weight</th>
<th>Volts</th>
<th>Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFT-1200-1</td>
<td>12&quot;</td>
<td>1/30</td>
<td>1,550</td>
<td>760 CFM*</td>
<td>MIT-1600 16&quot;</td>
<td>12 lbs.</td>
<td>115</td>
<td>0.9</td>
</tr>
<tr>
<td>SFT-1600-1</td>
<td>16&quot;</td>
<td>1/10</td>
<td>1,725</td>
<td>1,250 CFM</td>
<td>MIT-2000 20&quot;</td>
<td>21 lbs.</td>
<td>115/230</td>
<td>1.3/0.65</td>
</tr>
<tr>
<td>SFT-2000-1</td>
<td>20&quot;</td>
<td>1/3</td>
<td>1,725</td>
<td>3,122 CFM</td>
<td>MIT-2200 22&quot;</td>
<td>31 lbs.</td>
<td>115/230</td>
<td>3.8/1.9</td>
</tr>
</tbody>
</table>

*Cubic feet per minute

INTERIOR-MOUNT GAS HEATERS
A Gas Heater requires an external fuel source, either gas or propane and is mounted on the interior of a structure. An internal fan circulates the warm air throughout the greenhouse.

INTERIOR-MOUNT ELECTRIC HEATERS
An Electric Heater does not require an external fuel source and is mounted on the interior of a structure. The heat is generated through electric coils and an internal fan circulates the warm air throughout the greenhouse.

EXTERIOR-MOUNT HEATERS
Exterior-mount heaters should be mounted at floor level and work in conjunction with a louvered vent installed at the ridge and opposite of the heater.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>BTU output</th>
<th>Dimensions (LxHxD)</th>
<th>Entering Airflow (CFM*)</th>
<th>Heat Throw (ft) at Max Height</th>
<th>Volts</th>
<th>Amps</th>
<th>Fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modine Hot Dawg</td>
<td>HD30</td>
<td>24,000</td>
<td>26¾&quot;x12¼&quot;x22&quot;</td>
<td>505</td>
<td>25</td>
<td>115</td>
<td>3.7</td>
<td>Gas</td>
</tr>
<tr>
<td>Modine Hot Dawg</td>
<td>HD45</td>
<td>36,000</td>
<td>26¾&quot;x12¼&quot;x22&quot;</td>
<td>720</td>
<td>27</td>
<td>115</td>
<td>3.7</td>
<td>Gas</td>
</tr>
<tr>
<td>Modine Hot Dawg</td>
<td>HD60</td>
<td>48,000</td>
<td>26¾&quot;x18&quot;x25&quot;</td>
<td>990</td>
<td>36</td>
<td>115</td>
<td>2.5</td>
<td>Gas</td>
</tr>
<tr>
<td>Modine Hot Dawg</td>
<td>HD75</td>
<td>60,000</td>
<td>26¾&quot;x18&quot;x25&quot;</td>
<td>1,160</td>
<td>38</td>
<td>115</td>
<td>2.5</td>
<td>Gas</td>
</tr>
<tr>
<td>Modine Hot Dawg</td>
<td>HD100</td>
<td>80,000</td>
<td>35½&quot;x20½&quot;x31&quot;</td>
<td>1,490</td>
<td>42</td>
<td>115</td>
<td>4.7</td>
<td>Gas</td>
</tr>
<tr>
<td>Modine Hot Dawg</td>
<td>HD125</td>
<td>100,000</td>
<td>35½&quot;x20½&quot;x31&quot;</td>
<td>1,490</td>
<td>42</td>
<td>115</td>
<td>4.2</td>
<td>Gas</td>
</tr>
<tr>
<td>Modine Electric</td>
<td>HER50</td>
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<td>20,000</td>
<td>37&quot;x26&quot;x15¾&quot;</td>
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<td>492296</td>
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*Cubic feet per minute

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HUMIDIFIERS/FOGGERS, OSCILLATORS, & SOLENOIDS
Humidifiers, or foggers, are utilized to control moisture levels in the air for optimal plant growth. When humidity drops below a predetermined level, a sensor triggers the humidifier to activate, blowing a fine mist throughout the space. For more advanced applications, high pressure foggers and oscillators are available.

TURBO XE500 & XE1000
- Used on mid-sized greenhouses; Models available for larger greenhouses
- XE500 propels water up to 25'
- XE1000 propels water up to 30'
- Quiet & noise free operation
- Withstands salt, lime, & acid exposure
- Withstands 100% relative humidity
- No filters or special pumps required

HYDRO SS700
- Used on smaller greenhouses
- Direct feed hanging units receive liquid through a visual flow meter control panel
- Equipped with a 5 GPH flow meter panel & 12’ condensation drainage line
- Propels water up to 20'
- No filters or special pumps required
- All hardware is stainless steel

OSCILLATOR
- Oscillates fogger for greater fog dispersement up to 70 ft. in diameter and uniform displacement
- Can be tied into iGrow controller with same wiring
- Waterproof container
- Compatible with XE model foggers
- 96 settings, in 3.75° increments
- 360° rotation in two minutes

WATER SOLENOID
- Can be tied into iGrow controller with same wiring
- ⅜” OD tube connection
- Shuts off water supply in the event of a power outage

<table>
<thead>
<tr>
<th>Model</th>
<th>Misting</th>
<th>HP</th>
<th>CFM</th>
<th>Dimensions (W x H)</th>
<th>Weight</th>
<th>Volts</th>
<th>Amps</th>
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<tbody>
<tr>
<td>Turbo XE500</td>
<td>11 GPH</td>
<td>½</td>
<td>2,160</td>
<td>17½” x 22½”</td>
<td>46 lbs.</td>
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<td>Turbo XE1000</td>
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<td>Hydro SS700</td>
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