

Automatic Misting Control



The Automatic Misting Control consists of a 24-hour timer and your choice of either a 6, 12, or 30 minute program repeating timer. These timers provide "on" times in multiples of 1/60 of the repeating time. These timers are attractively mounted on a sturdy aluminum panel ready for operation. Order solenoid, filter, pipe, nozzles and fittings separately. The repeating timer has an on/off switch and a 24 volt output. A digital Automatic Mist Control will be available in late 2001.

Phyto Irrigation Wire



The Phytotronics irrigation and sprinkler systems cable is made to provide years of service. Its specifications include 18 gauge, 2 conductor solid copper wire insulated with white and red polypropylene. The outside jacket cover is a semi-rigid heavy gauge PVC and is light blue in color. A rip cord is provided within the jacket for easier jacket stripping. Phytotronics wire is rated for use up to 30 volts and is UL approved for direct burial.

Misting Kits



All necessary components are assembled into kits that serve 1/2" and 3/4" systems in 6 different lengths from 25' to 150'. Each kit is complete with solenoids, filters, nozzles, pvc cement, fittings, wire, pre-drilled pipe, and installation instructions. Misting kits cover 4' to 6' bench widths. Watering Kits available on request.

DGT Mist Nozzles



These are one of the finest low pressure nozzles available to the horticultural industry. They are made with strict quality control measures to assure each nozzle performs per specifications. The misting nozzles are partly self-cleaning, as the needle vibrates slightly during operation. Any fertilizer which is water-soluble can be applied through the DGT nozzles. Available in three different gallon per minute ratings.

ULV Fog Nozzles



An ultra low volume fog nozzle for use in cooling and humidifying or misting. The nozzle's orifice is stainless steel mounted in a brass housing. For use with 1/8" pipe thread. Comes in extra fine, fine, medium and coarse mist.

Phyto-Mist Nozzles



A practical, low cost way to provide moisture for plant propagation and humidity control. All brass construction produces a flat circle of fog-like mist spray. Three spray volumes are available from 4 gph to 13 gph. Use with Phyto-Mist Saddles for easy installation.

THANK YOU FOR PURCHASING A PHYTOTRONICS®

12A 12 Zone

AUTOMATIC MISTING CONTROLLER Instruction Manual

4/01



13688 Rider Trail North • Earth City, MO 63045
314-770-0717 • Fax 314-506-4587

PLEASE READ ENTIRE INSTRUCTION MANUAL (INCLUDING LIMITED WARRANTY) BEFORE INSTALLATION.

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12A 12 Zone Misting Controllers

12A



IBA Water Soluble Salts



Use solutions for propagation of plants from cuttings: from easy to the most difficult to root. Simply adjust the concentration to suit the variety. Apply by spray, total immerse or dip.

Improve root growth of transplants and growing plants.

You make fresh solutions. Measure the powder and mix into a volume of water then use. Specially prepared IBA for the professional grower; replaces technical IBA, K-IBA and is less costly than prepared alcohol based rooting solutions. The Salts are FULLY WATER SOLUBLE to over 60,000ppm IBA and do not require buffering. You

do not dissolve salts in potentially phyto-toxic alcohol. EPA Reg. #63310-22

CapMat™



An efficient, light-weight, resilient, non-woven fabric for capillary pot watering. CapMat™ is labor saving and easy to install. It provides uniform and economical watering of potted plants, increasing their quality. CapMat™ Water Distribution Kits are also available. Additional information available upon request.

Aqua-Trough™



The Aqua-Trough™ growing and irrigation system provides growers with a means of expanding the growing area of their greenhouses 1 sq. ft. for each linear foot. Aqua-Trough™ operates as a subirrigation system providing uniform application of water and accepts most 4, 5, and 6 inch standard pots. The Aqua-Trough™ System can also be used for Hydroponic Growing. A four page brochure is available on request.

Phyto-Lite™



Phyto-Lite™ decreases growing time and increases plant quality. The grower can be assured of uniform, healthy seedlings when using the Phyto-Lite™. This unit efficiently lights up to 40 square feet of surface with 225 to 1200 foot candles. Phyto-Lite™ has many uses in horticulture and research. Uses 8-96" fluorescent bulbs. Great for schools and research facilities.

Digital Light Meter



Model FCM-10M+ Digital Footcandle Light Meter is accurate, portable, has a range of 0 to 10,000 footcandles and is economically priced. The light sensor has a cord length up to 3.5 feet. It comes with a deluxe carrying case and has a full 1 year warranty. Sales literature available upon request.

RHT4



Redi-Heat™ Thermostats are used for automatic control of heating elements, such as the Redi-Heat™ Propagation Mats and Redi-Heat™ Cables. The Redi-Heat™ RHT4 Thermostat can also be used to control portable electric heaters or heat lamps. It is a mechanical type thermostat with a range of 40-100°F with an accuracy of +/- 3°F. This unit has 4 outlets. Not to exceed 1800 watts total. Shown with optional bench plate. Color sales literature available upon request.

Redi-Heat™ Cables



These dependable cables are covered with a tough, moisture-proof PVC jacket and a continuous safety grounding braid for mechanical and electrical protection. All connections are sealed and moisture proof. The Redi-Heat™ cables have a single cable strand that eliminates the awkward layout procedure characteristic of continuous loop cables. All cables have a 5'10" lead. Sales literature available upon request.

Rhizopon® Rooting Hormones



AA Dry Powder

Rhizopon is used by horticulturalists worldwide to root an estimated 20 billion cuttings annually. Rhizopon AA Dry Powder is a convenient, color-coded, and ready-to-use compound, used to propagate new plant material. It is available in 1 lb. and 25 lb. containers in three different strengths. In continuous use since 1939.

0 Hr. REI. Informational flyer and 25 page Rooting Handbook available upon request.



AA Water Soluble Tablets

Rhizopon AA rooting tablets are formulated to be soluble in water. They are available in a pre-dosed tablet form for ease of making fresh solutions daily for several methods of application and uses. Rhizopon AA Water Soluble Rooting Tablets are packed in 20, 200 and 2,500 tablet containers. Convenient and easy to use. Informational flyer and 25 page Rooting Handbook available upon request.

LIMITED WARRANTY

Phytotronics®, Incorporated ("we") warrant to the original purchaser ("you") that the product or system accompanying this warranty (the "product") will be free from defects in material and workmanship existing at the time of manufacture and appearing within one (1) year from the date of original purchase. This warranty applies only so long as the product is stored, installed, operated and maintained in accordance with our recommendations, and when used under proper and normal use.

THIS WARRANTY SHALL BE EXCLUSIVE AND, TO THE EXTENT PERMITTED BY LAW, SHALL BE IN LIEU OF ANY OTHER WARRANTIES, WRITTEN OR ORAL, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

TO THE EXTENT IMPLIED WARRANTIES MAY NOT BE DISCLAIMED, THE DURATION OF SUCH WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS EXPRESSLY LIMITED TO THE ONE YEAR PERIOD OF DURATION OF THIS LIMITED WARRANTY. In certain circumstances, some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

When this Limited Warranty does not apply

This warranty does not cover claims resulting from failure to follow instructions on installation and use, neglect, misuse, accident, modifications, alterations, mis-application or repairs made by you or others, use of unauthorized attachments, use on a current or voltage other than specified, or overloading.

Your remedies

If a covered defect appears during the warranty period, we will (at our sole option) repair or replace the defective product with no charge for service or parts, provided that the product is delivered at your expense to our authorized service center. Parts and/or replacement product supplied under this warranty may be new or rebuilt at our option. Parts or products replaced will be our property. Any product which is repaired or any replacement product will be covered under this warranty for the remainder of the one year period or for 30 days after repair or replacement, whichever is longer. If it is not practical to repair or replace the product, we will

refund the purchase price of the product to you. THIS IS YOUR EXCLUSIVE REMEDY FOR BREACH OF THIS WARRANTY OR OF ANY IMPLIED WARRANTY OR OF ANY OTHER OBLIGATION ARISING BY OPERATION OF LAW OR OTHERWISE.

What is not covered by the Limited Warranty

The warranty does not include reimbursement for the expenses of labor, transportation, installation, removal or any other expenses which may be incurred by you. For instructions on how to obtain warranty service, call 314-770-0717 or write to **Phytotronics®** Customer Service, 13688 Rider Trail North, Earth City, Missouri 63045 and see the accompanying Repair Policy.

IN NO EVENT SHALL WE BE LIABLE OR RESPONSIBLE FOR PUNITIVE, EXEMPLARY, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, REVENUES OR SAVINGS ARISING OUT OF THE BREACH OR PERFORMANCE OF ANY WARRANTY OR THE USE OF INABILITY TO USE THIS PRODUCT FOR ANY PURPOSE WHATSOEVER.

YOUR EXCLUSIVE COMPENSATION FOR LOSS OR DAMAGE ARISING FROM PURCHASE, USE, REPAIR OR REPLACEMENT OF ANY PRODUCT SHALL BE LIMITED TO AN AMOUNT EQUAL TO THE PURCHASE PRICE OF THE PRODUCT. THIS LIMITATION OF LIABILITY SHALL BE APPLICABLE TO ANY CLAIMS PRESENTED TO US REGARDLESS OF THE LEGAL THEORY FORMING THE BASIS OF SUCH CLAIM, AND WHETHER SUCH THEORY INVOLVES NEGLIGENCE, CONTRACTUAL LIABILITY, FAILURE OF REMEDY OR OTHERWISE.

In certain circumstances, some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.



Please call for more information and pricing

Gemini™ Misting Controllers



The new "A" series of Phytotronics Gemini™ misting controllers have been designed to offer the highest degree of flexibility for growers who require a variety of misting intervals in different propagation zones. Some of the features include: Independent zone operation, built in battery backup, the patented Sun Sensor™, time extenders and more. One page mailer and six page color sales literature available upon request.

Hozon™ Brass Siphon Mixer



A time-tested, accurate proportioning device designed for small scale growers for the dispensing of fertilizers, insecticides, fungicides and other water soluble chemicals through a hose. The Siphon Mixer proportions at the rate of 1 gallon of concentrate to 16 gallons of water. One gallon of concentrate is dispensed in 3 to 5 minutes. Made of brass.

Redi-Heat™ Propagation Mats



The new Redi-Heat™ Propagation Mats provide flexibility to growers who need an even, constant heat to the root zone of freshly sown seed and cuttings to promote uniform plant growth. They can be used for small or large propagation areas, anywhere there is 120 vac current. The blue grounding foil is bonded to the outside surface to evenly distribute the heat and protect the grower from electrical shock should a scratch or puncture in the laminate expose the heating element. Color sales literature available upon request.

REPAIR POLICY

Authorization to return products for service (whether or not under warranty) must first be obtained by calling 314-770-0717 or writing to **Phytotronics®** Customer Service, 13688 Rider Trail North, Earth City, Missouri, 63045. Any product returned without proper authorization will not be accepted, and will be returned to the sender.

Product under warranty which is in need of repair is to be returned, postage prepaid, with a copy of the sale receipt or invoice and an explanation of the malfunction or defect. Product determined by us to be covered by the limited warranty will be, at our sole option, repaired or replaced and returned by standard UPS delivery service at no charge.

Product which requires service beyond the warranty period is to be returned, postage prepaid, with a check or money order made payable to **Phytotronics®, Inc.**, for \$95.00 US currency. The standard charge for service and repair is \$95.00 and includes a 90 day original purchase limited warranty and return by standard UPS delivery service.

If the product requires service or repair in excess of the standard \$95.00 service charge, you will be contacted by **Phytotronics®** Customer Service to determine appropriate action. **Phytotronics®** Customer Service will provide an estimate of repair costs. The controller will be returned by standard UPS delivery service. All repaired controllers will carry a 90 day repair warranty or the remaining balance of the 1 year original purchase warranty whichever is longer.

Product which is inspected but not repaired or which is beyond repair will be subject to a minimum \$50.00 service charge to cover inspection and return by standard UPS delivery service. The remaining \$45.00 will be refunded to you.

If you request return by express or overnight delivery services, or postal services other than UPS, you will be billed for the additional charges incurred.

We will make every reasonable effort to repair and return your product within 72 hours of receipt. Our standard repair policy and practice require that every unit, whether new or repaired, be fully tested and inspected for proper operation, and exercised under full load for 24 hours prior to return.

THE LIMITATIONS DESCRIBED UNDER THE LIMITED WARRANTY APPLY TO ANY REPAIRED OR REPLACED PRODUCT, WHETHER OR NOT UNDER WARRANTY.

LOANER POLICY

Customers in need of a loaner controller may contact **Phytotronics®, Inc.** at 314-770-0717. Loaners are available for up to 21 days to those who need the use of a controller while one of their controllers is being repaired. The handling charge for loaners is \$45.00 and includes UPS freight charges for delivery of a loaner to customers in the continental United States. Loaners are shipped regular UPS unless the customer requests and agrees to pay for second day air or next day air UPS service. **Phytotronics®, Inc.** reserves the right to require a \$45.00 prepayment and a \$300.00 deposit prior to sending a loaner to customers who have been delinquent in the past, are currently past due, or do not have a previously established charge account.

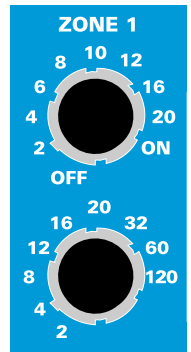
Quick Start Instructions

1. Mount the controller per the instructions on page 7 of the manual.
2. Turn the controller power switch "off".
3. Plug the controller power cord into a grounded outlet.
4. Connect your solenoids to the terminal strip. Example: Zone 1 valve will be wired to positions 1 and 1. Zone 2 will be wired to positions 2 and 2.
5. Turn the controller power switch "on".

Understanding Your Controller

"Zone Control Blocks"

Your new **Phytotronics® 12A** controller has twelve (12) "Zone Control Blocks". Each "Zone Control Block" contains the necessary switches and lights to control the misting operation for that zone. Each "Zone Control Block" contains the following three (3) items: 1) a "Zone On Indicator (LED lamp)"; 2) a "Seconds of On Time" rotary switch; and 3) a "Minutes Between Cycle" rotary switch. The operation of each of these zone controls is described in detail below.

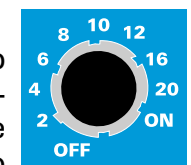


"Zone On Indicator (LED Lamp)"

The "Zone On Indicator" is a light located at the top of each "Zone Control Block" on your new **Phytotronics® 12A** controller. The light is an indication that 24VAC power is being delivered to the zone's valve.

"Seconds of On Time"

The "Seconds of On Time" switch is located in the top portion of the "Zone Control Block". Rotating the selector switch clockwise will increase the amount of time during which 24VAC output power will be delivered to the appropriate valve. Rotating the selector switch counter-clockwise will decrease the amount of time. "Seconds of On Cycle" selections for the 12A controller are listed below:



MODEL

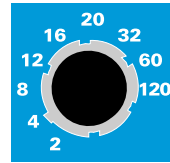
12A (1/2X)
12A (1X)
12A (2X)
12A (3X)

AVAILABLE SELECTIONS (Seconds)

OFF, 1, 2, 3, 4, 5, 6, 8, 10 and ON
OFF, 2, 4, 6, 8, 10, 12, 16, 20 and ON
OFF, 4, 8, 12, 16, 20, 24, 32, 40 and ON
OFF, 6, 12, 18, 24, 30, 36, 48, 60 and ON

"Minutes Between Cycle"

The "Minutes Between Cycle" switch is located at the bottom of each "Zone Control Block". Rotating the selector switch clockwise will increase the amount of time between the start of each "On" cycle when 24VAC power is delivered to the appropriate valve. Rotating the selector switch counter-clockwise will decrease the amount of time. The "OFF" position will prohibit any valve operation; while the "ON" position will force the valve into continuous operation. The "ON" and "OFF" positions are considered manual operations. "Minutes Between Cycle" selections for the 12A controller are listed below:



MODEL

12A (1/2X)
12A (1X)
12A (2X)
12A (3X)

AVAILABLE SELECTIONS (Minutes)

1, 2, 4, 6, 8, 10, 16, 30, 60
2, 4, 8, 12, 16, 20, 32, 60, 120
4, 8, 16, 24, 32, 40, 64, 120, 240
6, 12, 32, 36, 48, 60, 96, 180, 360

"Power Switch"

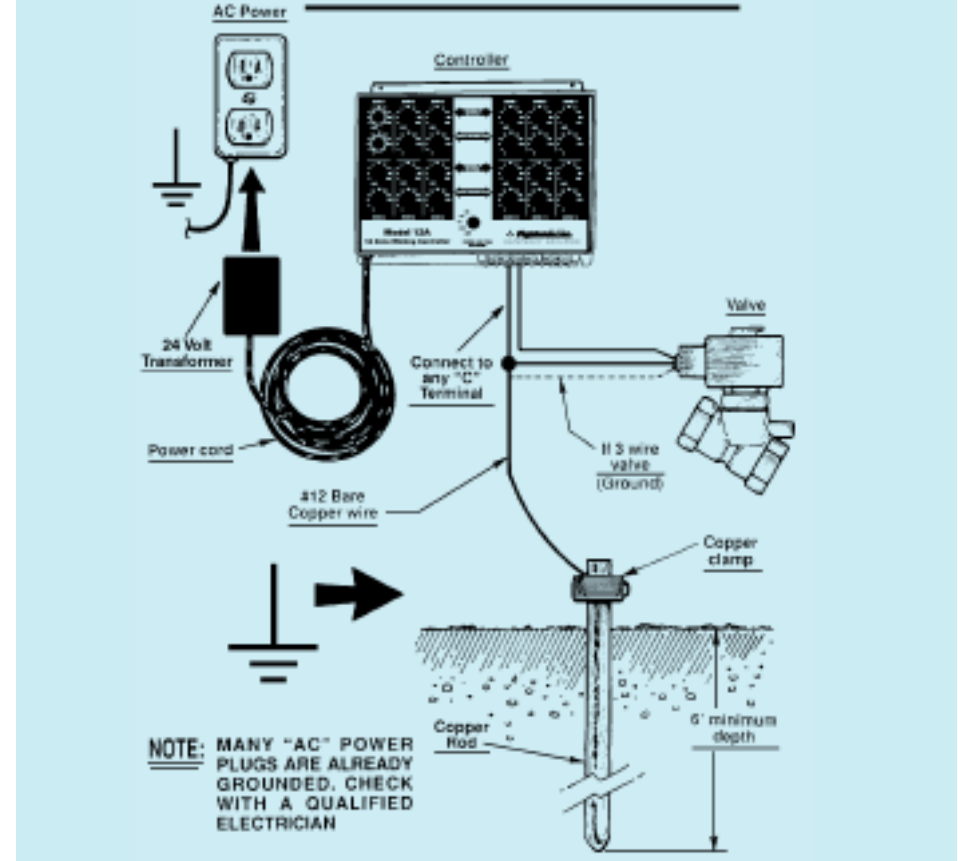
The power switch is located on the time extender knob. Select a time extender function to turn clock on. Select "OFF" to turn clock off.

Self-Resettable Internal Fuse

Each Phytotronics® 12A controller is supplied with a 2 AMP self-resettable internal fuse to prevent damage to the internal circuits as well as to valve wiring and low wattage solenoid valves. The fuse will interrupt all internal power to the controller and the 24VAC power to the valves. Should the 'short circuit' still exist, the fuse will again trip and interrupt service.

Manufacturer's Note: Whenever the fuse 'trips' it is recommended that all valves and valve wiring be inspected for 'short circuits'. Excessive tripping of the fuse will shorten its lifetime, requiring fac-

GROUNDING PROCEDURES FOR PHYTOTRONICS CONTROLLERS



ON and OFF Control: Each Zone of the **Phytotronics® 12A** controller 'Seconds or On Cycle' has two manual operations positions, ON and OFF. ON is a good way to check valve operation or Zone location. OFF provides a means of turning off unused Zones or removing power to the terminal strip when connecting new solenoid valves to the controller.

Operational Notes:

Two internal time clocks in the **Phytotronics® 12A** controllers provide misting control. Both clocks start when the controller power is turned ON.

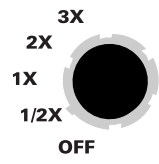
Wiring Diagrams for Terminal Strips

1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12
Common	Zone 1	Common	Zone 2	Common	Zone 3	Common	Zone 4	Common	Zone 5	Common	Zone 6	Common	Zone 7	Common	Zone 8	Common	Zone 9	Common	Zone 10	Common	Zone 11	Common	Zone 12

tory service and grower loss of use. Short circuits may be caused by crossed wiring, improper grounding techniques, damaged valves, moisture collection, or an internal controller malfunction.

"Time Extender Block (Phytotronics® 12A)"

Phytotronics® 12A controllers are equipped with an additional feature; the "Time Extender". The "Time Extender" is a five (5) position rotary switch which will multiply the "Seconds of On Time" and "Minutes Between Cycle" times by one half (1/2X), one (1X), two (2X), or three (3X), depending on switch position. Selection of the 1X position indicates that the "Seconds of On Cycle" and "Minutes Between Cycle" periods will be as they are marked. Selection of the 2X position of the "Time Extender" will double all time periods, and selection of 3X will triple the time periods.



Example #1: With the "Time Extender" set for 3X operation:

Function	Knob Setting Position	Actual Time
"Seconds of On Time"	20 seconds	60 Seconds
"Minutes Between Cycle"	60 minutes	180 Minutes

NOTE: **Phytotronics® 12A** controllers have water-tight, easy-turn switches that endure many years of continued use. Each switch has a fixed stop position at the minimum and maximum selectable time. DO NOT force the switches past the minimum or maximum times available for your model.

Installing Your Controller

CONTROLLER LOCATION:

Selecting the proper location for mounting your new **Phytotronics® 12A** controller is important, and there are several guidelines you should follow to insure long and satisfying service.

- 1) HEAT:** Avoid locations of excessive heat, such as extended exposure to direct sunlight and locations near heaters or boilers.
- 2) VENTILATION:** Provide adequate ventilation to the controller. Do not mount the controller in enclosed areas. Allow a minimum of 3" clearance on all sides of the unit to allow proper air flow and avoid excessive heating of the unit.

3) **LIQUIDS:** Select a location where the controller is away from direct and continuous flooding from liquids.

4) **POWER:** 24V plug in transformer supplied.

CONTROLLER MOUNTING: Your new **Phytotronics® 12A** controller is supplied with all necessary mounting hardware for a typical installation. For hollow-wall or concrete mounting surfaces, additional hardware may be required to secure the controller properly.

Pre-drill the marked locations with a 1/8" or smaller starter hole. Install the two (2) bottom mounting screws, leaving approximately 1/16" between the head of the screw and the mounting surface. Test fit the controller by inserting the bottom mounting holes over the head of the mounting screws. Loosen or tighten the mounting screws as required, to provide a snug-fit between the controller and mounting surface.

Starting Your Controller

After you have selected and mounted your **Phytotronics® 12A** misting controller, and wired the solenoid valves, you are ready to begin misting operations. Improper grounding will void the warranty of the 12A controller (See page 11, for correct grounding techniques).

Do Not connect solenoid valves to the controller before verification and trial operation.

Connecting the 24VAC Power Plug: Be sure the **Phytotronics® 12A** controller power switch is in the "off" position. Plug into connector. Ensure the power cord is routed away from walkways and high traffic areas to prevent accidental interruption of power to the controller.

Turning on the Power: For first time start-up and an understanding of your new **Phytotronics® 12A** controller, follow these procedures.

1) Turn all of the Zone "Seconds or On Time" selector switches to the desired position.

2) Turn all of the Zone "Minutes Between Cycles" selector

switches to the desired time.

3) Turn the "Time Extender" selector switch to the 1X position.

Each controller is put through a "Burn-in" process that checks and verifies all systems are functioning properly before it leaves our "factory". However, circuits may become loose, etc. during shipping or other rough handling. Therefore, it is necessary to be sure that your controller is operating correctly by testing it in the following method. Make sure the green light of zone one lights and valve turns on.

Should the green light not be observed, turn the "Power" switch to the off position. Check the power cord connections and restart the controller. If it still does not work, call **Phytotronics®**.

The **Phytotronics® 12A** misting controller will now begin automatic zone cycling. Each Zone light will come on sequentially, indicating that 24VAC power is being supplied to the solenoid valves. If a Zone light fails to come on, or if the Zones fail to sequence properly, check for the proper settings of the "Seconds of On Time" and "Minutes Between Cycle" selector switches.

Connecting Solenoid Valves to the Controller

Valve Connector: Solenoid Valves are connected to the 12A controller via a terminal strip located on the bottom right of the controller. **Phytotronics® 12A** controllers have two 12 position strips for connection of 6 valves per terminal strip. Locate the terminal strip on your controller and familiarize yourself with the positions and markings on the terminals.

The terminal strip accepts 22 thru 12 gauge wire, and will require a slotted screwdriver for wire attachment.

For grounded valves (valves with 3 wires), the ground wire may remain 1) disconnected; 2) connected to a terminal; or, 3) connected to a metal grounding rod or water line.

Always turn the controller Power switch OFF or switch all Zone "Seconds of On Cycle" to the OFF position before connecting valves to the controller. Connecting valves to active Zones may cause power surges which may damage the controller or solenoid valve.