



# **MICRO GROW**

## **GREENHOUSE SYSTEMS, INC**

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### **Water Max Control System**

# ***12 Station Misting and Irrigation Control***

The WATER MAX is a “state of the art” microprocessor based control panel. This control features twelve fully programmable outputs. Each output may be set for propagation mist or irrigation. The outputs will deliver 24 VAC to solenoid valves connected to the control panel. Each output is rated at a maximum of 2 amps (48 watts).

## ***Features:***

**Large Digital Display.** This large display will feature the time of day, a list of the operating stations, and assist in the programming of the control.

**Manual Override Switches.** Each station has a manually override switch that can be used to manually operate each individual station. In the automatic position, the station will work automatically. In the off position, the station will not operate.

**Lighted LED Station Indicators.** Each station has an individual lighted LED indicator. This indicator will light when that particular station is energized manually or automatically.

**Programming Switches.** These three switches are located on the front panel. These are used to advance through the settings and set the control panel up for operation.

**Photocell.** A panel-mounted photocell will automatically detect day and night.

**Microprocessor.** An advanced microprocessor controls all on board functions. An internal EEPROM assures that all settings will be saved, even on power interruptions for extended periods of time.

**DIP Switches.** A set of DIP switches is featured on the internal circuit board. Use these to customize your particular needs. The maximum number of valves that can be in operation at any one time due to water pressure restraints and the ability to mist at longer intervals during the night mode of operation are offered.

**Internal, 24-hour digital clock.** A very accurate, crystal driven digital clock keeps the time of day internally. The time is maintained during power interruptions.

**Non-Metallic enclosure.** The entire control system is encased in a clear covered, hinged front, non-metallic enclosure.

## ***Installation Procedures***

### **Panel Mounting:**

Mount the control panel in an accessible location. Make sure that the location is free of vibration and in close proximity to the devices being controlled. Always consider voltage drop of electrical current when locating the control panel. Securely mount the panel.

### **Transformer:**

A 24 VAC transformer will power the control panel. The transformer must be a heavy-duty type that will be able to handle the load of all of the connected solenoid valves, in addition to the control power requirements. In any case, do not use less than a 40 VA transformer. It is highly recommended that a "Machine Tool" variety be used. A Machine Tool Transformer is a heavy-duty variety that will allow for high inrush currents that are associated with the use of valves.

### **Electrical Circuit:**

The electrical circuit that feeds the machine tool transformer should have no other loads connected to it. This will prevent damaging surges from other related electrical devices. Follow all local and national codes in the connection of all of the greenhouse equipment. Always allow for voltage drop conditions. Always consider that the greenhouse is a wet environment.

### **Wiring Methods:**

Always use stranded wire when connecting cables or conductors to the actual circuit board of the control panel. This will allow flexibility. Use no smaller than #20 gauge stranded wire for all valve connections. Use larger wire for greater distances.

### **Valve Conductors and Wiring:**

Route all valve wiring conductors separately from power wiring (120 VAC and above). This is very important so as to reduce electrical interference. Two conductors are needed for each valve, 24 VAC from the station output, and 24 VAC Common. You may use a multi-conductor cable with a single common line and individual lines for each valve if desired.

### **Valve Selection:**

You may use any standard 24 VAC watering or misting valve with a holding current of 10 watts or less. Be sure to not exceed a total of three valves on any one station. If you will require more than three valves on a station, contact your distributor for information on how to do this. Always make sure that your transformer is sized correctly for the number of valves that you will be using.

## Front Panel Switches and Indicator Lights

<i>Program Switches:</i>	<i>Function:</i>
<b><i>RUN-SET</i></b>	Depressing this switch will put the control in a program or "Set" mode of operation. Return the control to a "run" or operate mode by holding the switch up. The control will automatically return to the run mode after a period of time.
<b><i>PRIOR-NEXT</i></b>	This will advance through the items in the group selected while in the "set" mode. You may also use this switch to advance the display while the control is operating.
<b><i>VALUE</i></b>	Increases or decreases the flashing item's value or changes the selection available. Also, you may use this switch to "freeze" the display while in the "run" mode of operation.
<i>Indicator LED's:</i>	<i>Function:</i>
<b>SET UP STATIONS</b>	Select whether a station is Propagation Mist (Pro), Irrigation (Irr), or not in use (OFF)
<b>SET CLOCK</b>	Set the internal clock. The flashing item will change by using the UP-DOWN switch. Advance to the next item by using the NEXT-PRIOR switch.
<b>SET MISTING</b>	This will set the misting on and off times. The first flashing number is the first station that is set for misting, the next number is the time that it is set for.
<b>START TIME</b>	When this LED is lighted, select the desired starting time. You may select a time of day, or when setting misting stations, you may select the photocell.
<b>END TIME</b>	Set the desired ending time for the misting stations. Again, you may also select the photocell to end the misting cycle at sunset.
<b>SET IRRIGATION</b>	This will set the irrigation run times on times, days of operation, and repeats (if desired).

## Getting Started

### Set Up Stations:

Use the SET switch to advance to the SET UP STATIONS indicator. The flashing digit will indicate the station number to be set. The station number may be changed while it is flashing by using the UP/DOWN switch. By depressing the NEXT/PRIOR switch while at the desired station, the type assignment for this station can be changed. Change the flashing type assignment by using the UP/DOWN switch. Select from "Pro" (propagation misting), "Off", or "Irr" (irrigation). You may use the NEXT/PRIOR switch to advance through all of the stations.

### Set Clock:

The flashing digit will be the one that can be changed by using the UP/DOWN switch. Enter the correct hour, and then depress the PRIOR/NEXT switch to set the minutes. Repeat for AM (A) or PM (P).

### Set Misting Stations On and Off Times:

If any stations have been set to misting, these will appear under this mode. Use the SET switch to advance to the SET MISTING mode. The first flashing digit will be the station number that is being set. You may advance to any station by using the UP/DOWN switch, or you may use the NEXT/PRIOR switch to advance through all of the misting stations. When the desired station appears, depress the NEXT/PRIOR switch to set the misting on time in seconds for that particular station. Use the UP/DOWN switch to increase or decrease the on time settings. When finished setting the on time, depress the NEXT/PRIOR switch to set the desired off time in the same manner. The off time will be in minutes. Repeat for all stations by using the NEXT/PRIOR switch. You may use this mode to check the settings for all stations.

### Set Misting Start and End Times:

Use the SET switch to advance to the SET MISTING and START TIME indicators. The desired misting starting time will appear here. Use the UP/DOWN switch to advance to the desired hour of day to start misting. Use the UP/DOWN switch to change the desired setting. Use the NEXT/PRIOR switch to advance to the minutes, and also AM or PM. When finished setting the desired start time, advance to the end time by using the NEXT/PRIOR switch. Set the ending time in the same manner. You may select "PHO" as a start time or end time in place of the hour setting. What this means is that the misting will start or stop based on the photocell detection of sunrise and sunset.

### Set Irrigation Station On Times:

If any stations have been set to irrigation, these will appear under this mode. Use the SET switch to advance to the SET IRRIGATION mode. The first flashing digit will be the station number that is being set. You may advance to any station by using the UP/DOWN switch, or you may use the NEXT/PRIOR switch to advance through all of the irrigation stations. When the desired station appears, depress the NEXT/PRIOR switch to set the irrigation on time in minutes for that particular station. Use the UP/DOWN switch to increase or decrease the on time settings. When finished setting the on time, depress the NEXT/PRIOR switch to set the desired days of operation for that particular station. You may select ALL (every day), 2<sup>nd</sup> or 3<sup>rd</sup>. Repeat for all stations by using the NEXT/PRIOR switch. You may use this mode to check the settings for all stations.

### Set Irrigation Start Times, Days of Operation, and Repeats:

Use the SET switch to advance to the SET IRRIGATION and START TIME indicators. The desired irrigation starting time will appear here after two seconds. The display will first flash the station being set. Remember that you may have a separate starting time of day for each irrigation station. Use the UP/DOWN switch to advance to the desired hour of day to start irrigation for that station. Use the NEXT/PRIOR switch to advance to the minutes, and also AM or PM. After setting the desired start time, you may then select if you would like to repeat this irrigation station. What this will do, is to automatically run the station again after a selected time delay. If this is desired, enter the number of repeats here. The display will indicate "rEP" (Repeats), enter the desired number from 0 to 9. If no repeats are desired, enter 0. If any repeats are entered other than 0, the display will then indicate the desired time between repeats for that particular station. Enter that waiting time at this point by using the UP/DOWN switch to select the waiting delays. You may select from 1/2 to 8 hours.

## LIMITED WARRANTY

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