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INTRODUCTION

This manual describes the setup and use of your new Hydroponics and Greenhouse Control System. This system is easy to use for simple growing areas but has advanced features for more complex needs. Setup is very simple with an uncluttered control panel. This manual starts with simple descriptions and goes on to more detail in later chapters.

HOW TO USE THIS MANUAL

The **Location of Controls** chapter (page 3) shows the Plant Pro's front panel and what each part is called. See the **Quick Start** chapter (page 4) for a brief installation of a basic system. Later chapters give all the details including more complex systems. The **Installation** chapter (page 8) explains how to hook up each part of a complex system in more detail. The **Operation** chapter (page 15) gives details on setup and running. The **Appendix** (page 35) has various useful information including a **Problem Solving** section (page 35) if you are having problems. And last, but not least, is an **Index** (page 37) to look things up if you can't find them in the **Table of Contents** (page 1) in the front of this manual.

FEATURES

FOUR OUTLETS FOR EASY PLUG-IN

- Lamp
- Pump
- Vent Fan
- CO2 Tank or Generator

FOUR SENSORS WITH 10 FOOT CABLES

- Temperature
- Humidity
- CO2 PPM
- Photocell (light level)

EASY SET-UP

- One knob to select what you want
- ... a second knob to set it
- and a display to show it

BASIC AND ADVANCED CONTROL MODES

- Simple control by time clock or any of three photocell modes
- CO2 tank or generator can be controlled by time clock or CO2 Sensor

ADVANCED SECURITY CAPABILITIES

- Sensor shuts off all outlets in case of flooding
- Remotely triggered shut off
- Remote alarm triggering

LOCATION OF CONTROLS

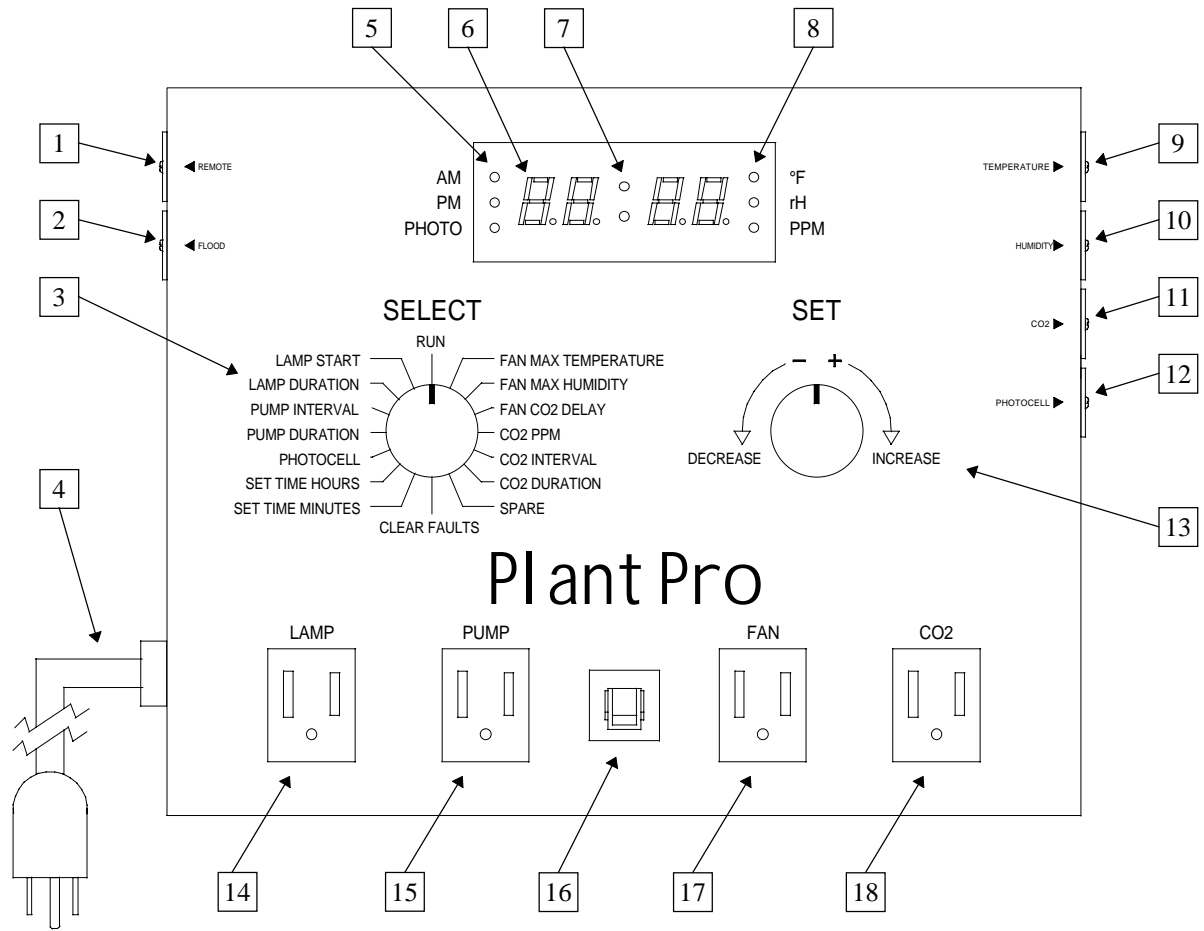


Figure 1 Plant Pro Front View

- | | |
|-----------------------------------|----------------------------------|
| 1. Remote connector | 10. Humidity Sensor connector |
| 2. Flood Sensor connector | 11. CO2 Sensor connector |
| 3. Select Knob | 12. Photocell Sensor connector |
| 4. Power cord | 13. Set Knob |
| 5. AM, PM, and Photo indicators | 14. Lamp Outlet |
| 6. Digital display | 15. Pump Outlet |
| 7. Colon indicators | 16. Circuit Breaker |
| 8. °F, rH, and CO2 PPM indicators | 17. Vent Fan Outlet |
| 9. Temperature Sensor connector | 18. CO2 Tank or Generator Outlet |

QUICK START

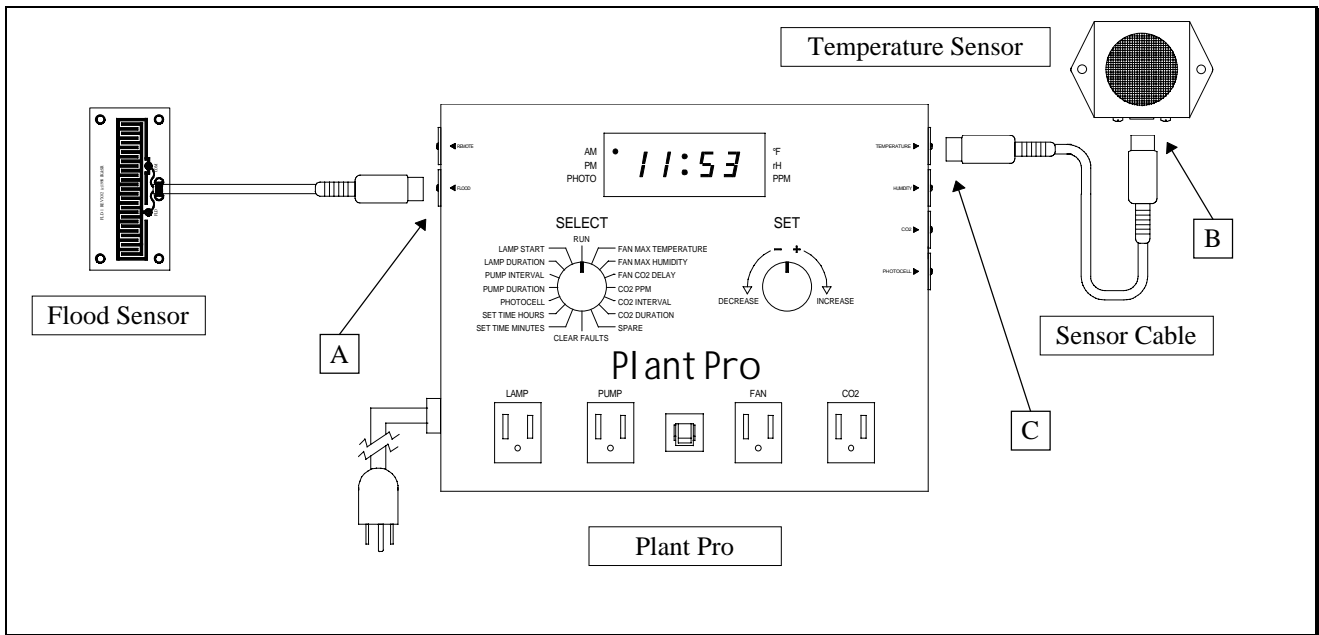


Figure 2 QUICK START Sensor Connection

INTRODUCTION

The Quick Start instructions are for the basic Plant Pro system which ships with a Temperature Sensor and a Flood Sensor. Even though you may have purchased other sensors, such as the Humidity Sensor, Solatel CO2 sensor, or Photocell Sensor, it is best to set up the basic system first. This will let you get the general idea of how the Select control Knob and the Set control Knob work together with the display to allow for quick and easy setup of all the Plant Pro's functions. Once you are familiar with this unique set up method, you will be able to set up even the most complex system in a matter of seconds.

In general, you select one of the Plant Pro's functions with the Select Knob. You view the present value on the display. Then you choose the value you want that function to have with the Set Knob. You enter these values into the Plant Pro's computer when the Select Knob is placed in the RUN position. It's as simple as that.

This setup will let you control your lighting system, irrigation pumps, and vent fan. You will set the time that the lamp turns on each day and how many hours it stays on. If the lamp is off, the pump is off too. You will set how often the pump comes on, that is, every hour, every two hours, and so on while the lamp is on. You will set how many minutes the pump stays on. You will set the temperature for the vent fan. If it gets hotter than your setting, then the vent fan turns on. If it gets cooler than your setting, then the vent fan turns off.

QUICK START ITEMS

These instructions are for a system with the items below. See later sections for more complex systems. It is recommended that you first get your system running in this configuration and then go on to a more complex system.

ITEM	DESCRIPTION
1	Plant Pro
2	Flood Sensor
3	Temperature Sensor
4	Sensor Cable
5	Lamp
6	Pump
7	Vent Fan

CONNECTING THE CABLES

Connect the sensors as shown in **Fig. 2** using the following instructions.

1. Be sure the Plant Pro is not plugged into the wall yet.
2. Place the Plant Pro in a dry, convenient place near the growing area.
3. Mount the Flood Sensor where it will get wet if there is an overflow problem but will not be stepped on.
4. Plug the cable from the Flood Sensor into the Plant Pro's Flood Sensor connector [A].
5. Mount the Temperature Sensor where it can measure the typical temperature.
6. Plug one end of the Sensor Cable into the Temperature Sensor [B].
7. Plug the other end of the Sensor Cable into the Plant Pro's Temperature Sensor connector [C].
8. Don't plug cords into the Plant Pro's outlets yet.
9. Turn the Select Knob on the Plant Pro to point to RUN.

SETTING THE CLOCK

1. Plug the Plant Pro's power cord into a wall outlet.
2. All of the Plant Pro's display will light up for one second, then the display will start flashing once a second.
3. Set the time using the following steps. For each step, turn the Select Knob to the indicated position. Then turn the Set Knob as described. Do each step in sequence.

STEP	SELECT KNOB	SET KNOB
1	SET HOURS	Turn to show the correct hours. If the correct hours show but not the correct AM or PM, keep turning until all are correct. Although the minutes are displayed, the Set Knob will not change them.
2	SET MINUTES	Turn to show the correct minutes. Although the hours are displayed, the Set Knob will not change them.
3	RUN	Now the new time will be used. The display should stop flashing (if the display continues to flash, see Faults (page 32)). Turn 5 or more "clicks" in the DECREASE direction. The display will show the time for two seconds. Next the display may show various sensor readings in sequence, each for two seconds. When a sensor is displayed its related indicator will be lit. The sequence of displays will then repeat. Turning the Set Knob will set what is displayed here. See Run (page 18) for details.

See **Clock** (page 16) for more details.

SETTING THE LAMP TIME

This sets up the lamp in Time Clock Mode. First get your system running in Time Clock Mode. See **Lamp** (page 19) for more details. If you have a Photocell Sensor, later set it up to control the lamp. The **Photocell Sensor** (page 13) and **Photocell Modes** (page 25) sections describe how to do this.

STEP	SELECT KNOB	SET KNOB
1	LAMP START	Turn to show the time to turn on the lamp. If the correct hours are displayed but not the correct AM or PM, keep turning until all are correct. Do not set to "PCon" or "PCLn".
2	LAMP DURATION	Turn to show the number of hours for the lamp to remain on. If the lamp is to be always on, set to 24:00. Do not set to "PCon".
3	PHOTOCELL	Turn in the INCREASE direction until "nonE" shows. This tells the Plant Pro to ignore the Photocell Sensor, whether installed or not.
4	RUN	Now the new settings will be used. If the display starts to flash, see Faults (page 32).

SETTING THE PUMP TIME

See **Pump** (page 20) for more details.

STEP	SELECT KNOB	SET KNOB
1	PUMP INTERVAL	Turn to show the number of hours between pump cycles. Set to 1:00 to turn on at the beginning of every hour the lamp is on, 2:00 for every other hour, and so on.
2	PUMP DURATION	Turn to show the number of minutes the pump is on each pump cycle.
3	RUN	Now the new settings will be used.

SETTING THE VENT FAN TEMPERATURE

See **Fan and CO2** (page 21) for more details.

STEP	SELECT KNOB	SET KNOB
1	FAN MAX TEMPERATURE	Turn to show the desired maximum growing area temperature. The vent fan will turn on when the actual temperature is above this, off when below. Do not set to "nonE"
2	RUN	Now the new settings will be used.

OTHER SETTINGS

These settings turn off the other functions that are not used for the initial setup in this Quick Start section. First get this initial setup running. Later on add them if you have purchased Humidity or CO2 Sensors or have CO2 dispensing equipment. The **Installation** (page 8) and **Operation** (page 15) chapters describe how to add them.

STEP	SELECT KNOB	SET KNOB
1	FAN MAX HUMIDITY	Turn in the INCREASE direction until "nonE" shows. This tells the Plant Pro to ignore the Humidity Sensor, whether installed or not.
2	CO2 PPM	Turn in the INCREASE direction until "nonE" shows. This tells the Plant Pro to ignore the CO2 Sensor, whether installed or not.
3	FAN CO2 DELAY	Turn in the DECREASE direction until :00 shows.
4	CO2 INTERVAL	Turn in the DECREASE direction until :05 shows.
5	CO2 DURATION	Turn in the DECREASE direction until :00 shows.
6	RUN	Now the new settings will be used.

FINAL CONNECTION AND RUN

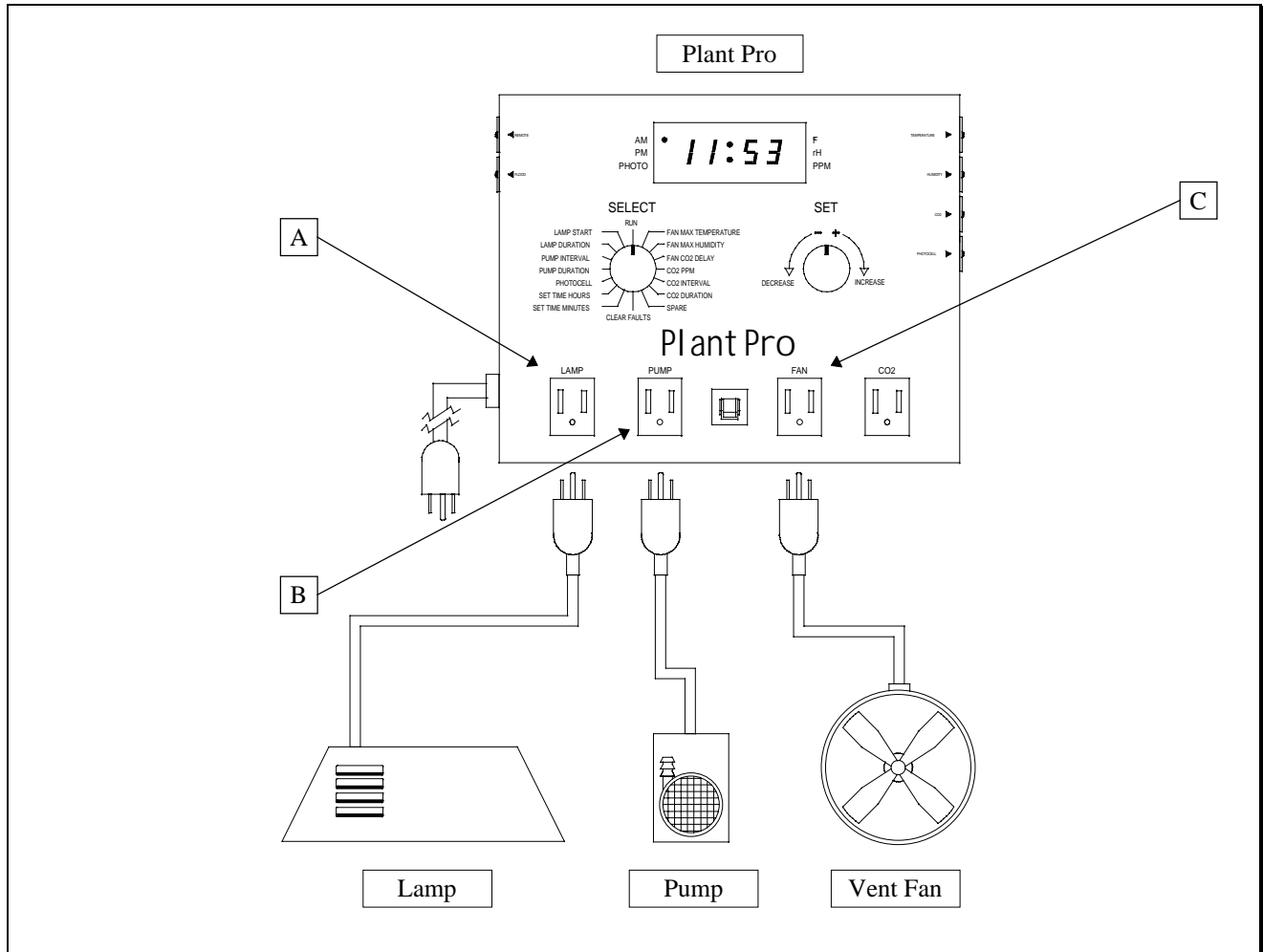


Figure 3 QUICK START Lamp, Pump, and Vent Fan Connection

1. If the lamp, pump or vent fan have switches on them, turn them off.
2. Plug the lamp into the Plant Pro outlet labeled LAMP [A].
3. Plug the pump into the Plant Pro outlet labeled PUMP [B].
4. Plug the vent fan into the Plant Pro outlet labeled FAN [C].
5. If the lamp, pump or vent fan have switches on them, turn them on
6. The system should now run according to the settings previously entered.

Your QUICK START system is now ready to use.