

This circuit is used to control the water pump for watering plant and flower automatically. It measures the soil moisture in 3 levels with delay time.

**Technical data**

- Power supply : 12VDC.
- Electric current consumption : 46 mA. (working), 25 mA. (standby)
- With 3 LEDs for showing 3 different levels of soil moisture.
- Delay time : 4-240 seconds
- Maximum load : 1A.
- IC board dimension : 2.31 in x 1.29 in.

**How does it work**

The circuit diagram is shown in Figure 1. Its operation is based theoretically on the soil moisture content which is a conductor of electricity. The voltage that flow from the soil via PROBE to the circuit will be compiled by IC1/2, IC1/3 and IC1/4. The result of compilation presents the soil moisture levels, which are indicated by LED1-3.

**PCB assembly**

The assembly of components is shown in Fig. 2. For good looking and easy assembly, the shorter components should be first installed - starting with low resistant components and then the higher. An important thing is that diodes, electrolyte capacitors, and transistors shall be carefully assembled before mounting them onto their right anode/cathode of the IC board otherwise it might cause damage to the components or the circuit. Configuration of the anode and the cathode is shown in Fig 3. Use the soldering iron/gun not exceeding 40 watts and the solder of tin-lead 60:40 with flux within. Recheck the correctness of installation after soldering. In case of wrong position, just use lead absorber or lead extractor wire to avoid probable damage to the IC.

**Testing**

When the assembly is complete.

1. Adjust VR1 and VR2 to the left. Move switch SW1 to position one.
2. Supply 12VDC to the circuit. LED4 and LED5 will be lighted on and relay will start working.
3. Connect into PROBE position. LED1-3 will be lighted on. Then LED4 will be off and relay will stop working.

**Usage**

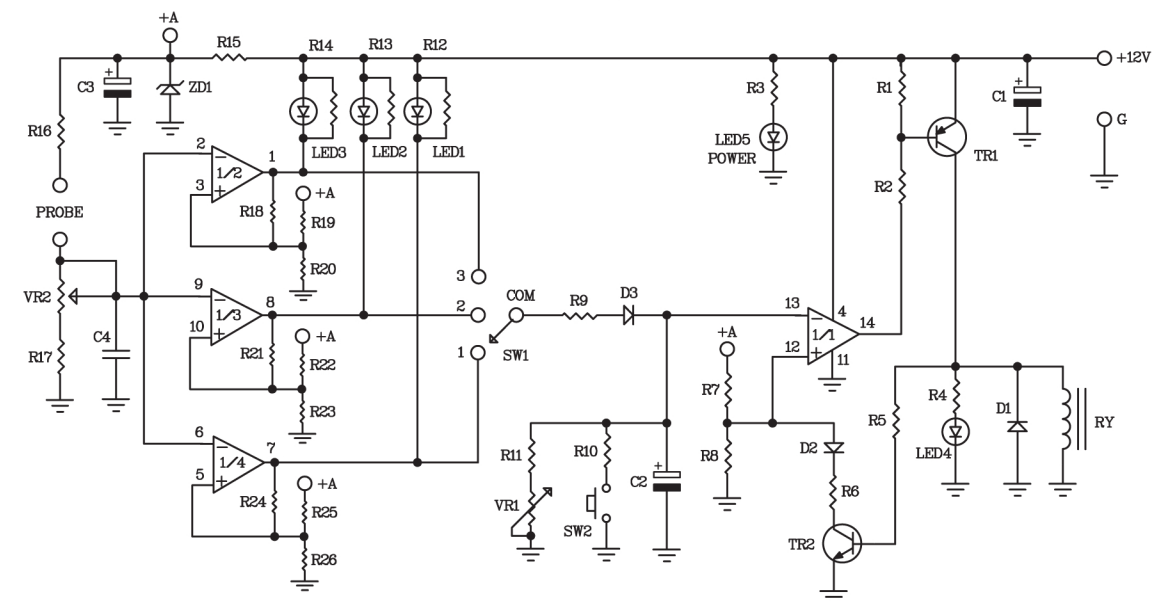
1. Connect the wire from PROBE positions and insert the metal probe into the soil.
2. Supply power into the circuit and observe at LED1-3, if the soil is dry, LED1-3 will not be on. Then the water pump will start working according to the set-time and LED1-3 will be lighted on.

NOTE: in case of dry soil but LED1-3 is on, adjust VR2 until LED1-3 is off.

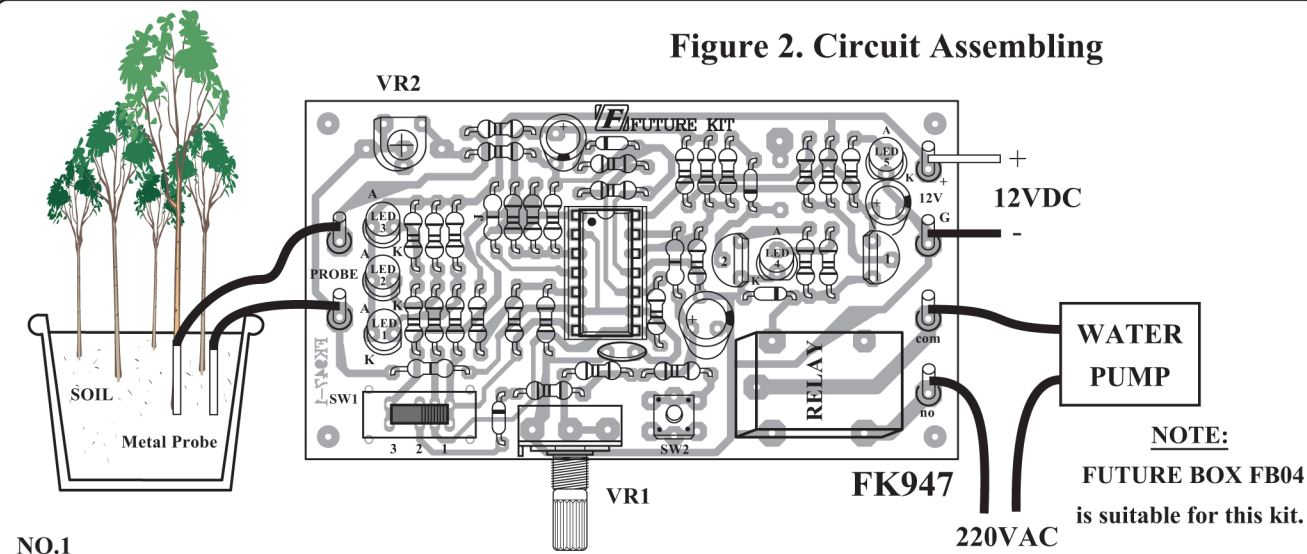
**Controlling points**

1. VR1 is used for controlling the time of watering.
2. VR2 is used for adjusting the watering according to the soil conditions.
3. SW1 is used for setting the moisture level when watering, which can be adjusted into 3 different levels:-
  - Level 1 for lowest moisture.
  - Level 2 for medium moisture.
  - Level 3 for highest moisture.
4. SW2 is used for stopping the relay.
5. LED1-3 are soil moisture level indicators:-
  - LED1 for lowest.
  - LED2 for medium.
  - LED3 for highest.

**Figure 1. The Automatic Sprinkler Control Circuit**



**Figure 2. Circuit Assembling**



**NOTE:**  
FUTURE BOX FB04 is suitable for this kit.

**Figure 3. Installing the Components**

