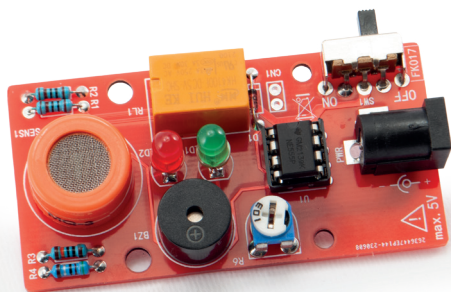


ALCOL TESTER (cod. FK017)



It allows for the detection and audible/visual alerting of an excessive concentration of ethyl alcohol in the breath and can activate devices through a relay if necessary.

Assembly

Begin the assembly by mounting components starting with those of the lowest profile, such as resistors and silicon diodes (to be oriented as indicated in the assembly plan visible on these pages). Proceed with the socket for the 555 timer, the horizontal trimmer, and the slide switch with right-angled pins. Continue with the DC power jack, the MQ-3 sensor, the miniature 5V relay, the piezo buzzer, and the two LEDs. Pay attention to the polarity of the two LEDs, whose cathodes (corresponding to the flat side on the package) should be facing the piezo buzzer BZ1. The piezo buzzer also has a polarity to be observed, so when inserting it into the respective holes on the PCB, ensure that the “+” sign is facing the longer side of the board where it should be positioned. The prototype photos and the assembly plan provided on these pages will be helpful in various stages of assembly.

Regarding usage, you will need a mains power adapter with a stabilized 5VDC output, capable of delivering 250 milliamperes of current. Alternatively, battery power is possible by choosing a battery pack with a 5V regulator or, even better, a power bank capable of providing a 5V voltage and sufficient current for good autonomy. Consider the circuit's power consumption, which even at rest is around 170 mA due to the MQ-3 sensor's heating filament.

To use the product, first switch the toggle switch

to ON. You may hear the buzzer sound because you will likely need to adjust the trimmer to set the alarm threshold, which is the sensitivity of our alcohol tester. At this point, if there is no alcohol in the air, rotate the trimmer counterclockwise and release it when the buzzer no longer sounds. For proper calibration, it is advisable to leave the device powered on for a few minutes (at least 5 minutes) with the trimmer set to the minimum and only proceed with calibration afterward. This allows the sensor, or its sensitive film, to reach its operating temperature, and its operation will become stable.

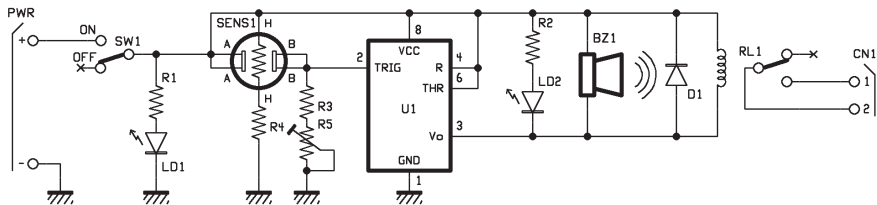
Once calibration is complete, you can use the device. In the presence of alcohol, the red LED will light up, the buzzer will sound, and the relay will activate, resulting in the closing of the contact on connector CN1.

It is important to note that this is not an alcohol breathalyzer, as our circuit does not perform measurements; it is an alcohol tester, meaning it alerts if the alcohol concentration is above the set threshold. To align it with devices used before driving, it would be advisable to compare it with one of these devices and adjust the trimmer after exhaling into it to determine when it signals an excess of alcohol. Alternatively, you can refer to the response graph provided in Figure 1 and adjust the trimmer so that LED LD2 lights up at the desired concentration of ethyl alcohol. For example, you can calibrate it by placing some

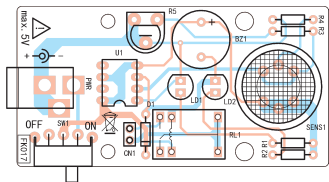
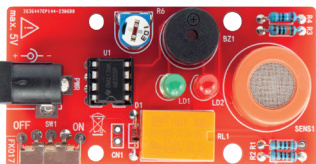
TECHNICAL SPECIFICATIONS

- Power supply: 5Vcc
- Maximum Current Draw: 250 mA
- Alcohol Sensitivity: 0.05±10 mg/L
- Audible and Visual Warning
- Adjustable Sensitivity via Trimmer

Circuit Diagram



[Assembly plan]



Component List:

- R1, R2: 1 kohm
- R3: 130 ohm
- R4: 5,1 ohm
- R5: Trimmer 10 kohm MO
- LD1: LED 5 mm green
- LD2: LED 5 mm red
- D1: 1N4148
- U1: NE555
- BZ1: Buzzer 5V
- SENS1: MQ-3
- SW1: Slide switch
- RL1: Relè 5V
- VARIE
- Socket 4+4
- Plug DC
- PCB FK017 (69x35 mm)

denatured ethyl alcohol on a table and holding the sensor with the circuit powered a few centimeters away; adjust the trimmer until the buzzer starts to sound and LED LD2 lights up, ensuring that everything returns to rest once the alcohol has evaporated.

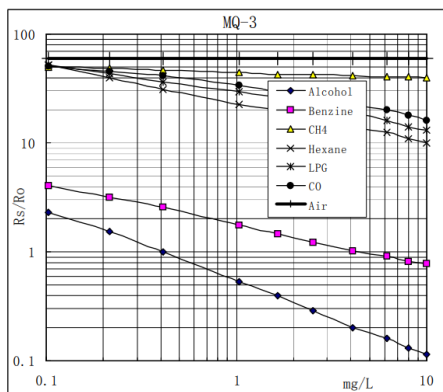


Fig.1 - MQ-3 Sensor Response to Various Types of Aerosols and Gases

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