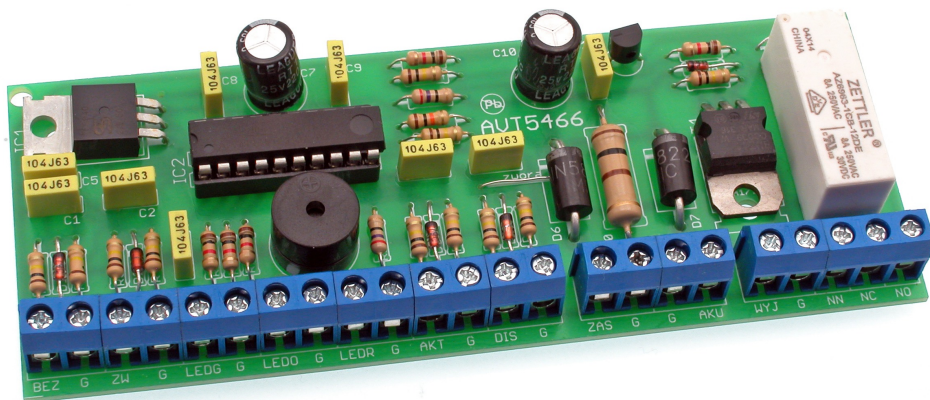




# AVT 5466



### ASSEMBLY DIFFICULTY



An uncomplicated alarm unit with monitoring lines: immediate and delayed. Several sensors can be connected in series to each of them, such as motion detectors, window and door opening sensors (e.g., reed switches), optical barriers and others with output in the form of normally closed (NC) contacts.

This unit is ideal for basic security in a house, flat or leisure cabin.

## Features

- relay output with load capacity 230 VAC / 8 A
- siren power output 12 VDC / 3 A
- 2 trigger lines: immediate and delayed with a delay time of 30 seconds
- operating status indication: 3 LEDs
- low battery voltage indication
- power supply 8-15 VDC, current consumption: 2 mA at stand-by, 100 mA at alarm

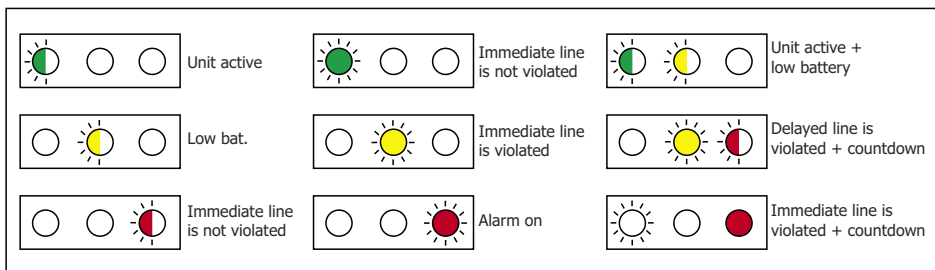
### Circuit description

Basic operating state of the unit is sleep. In this state, it will not respond to any events, its outputs are off, and the circuit activity is indicated by LEDs, green or orange, but only if any of the trigger lines are not closed. If the voltage of the backup battery drops below 10.5 V, the orange LED will additionally flash.

The LED states with their corresponding device states are shown in Figure 1. The unit is activated when its input is shorted to earth. Red LED will then flash, and the buzzer will beep periodically to indicate the time at which you should leave the protected area. After 30 seconds the unit will stand by, and before the trigger line circuits must be

closed, the green and orange LEDs off. Otherwise, the alarm procedure will start immediately. In the active state, a green LED is on every few seconds. If the alarm is reported via a delayed line, the unit can be deactivated within 30 seconds; if an immediate line is used, the sound alarm and relay will be activated immediately. The alarm condition is indicated by the continuous light of the red diode and the diode corresponding to the active trigger line.

The alarm siren will be switched off automatically after 1 minute, irrespective of the status of the triggering lines, another line violation will repeat the procedure. The relay output will be on for 1

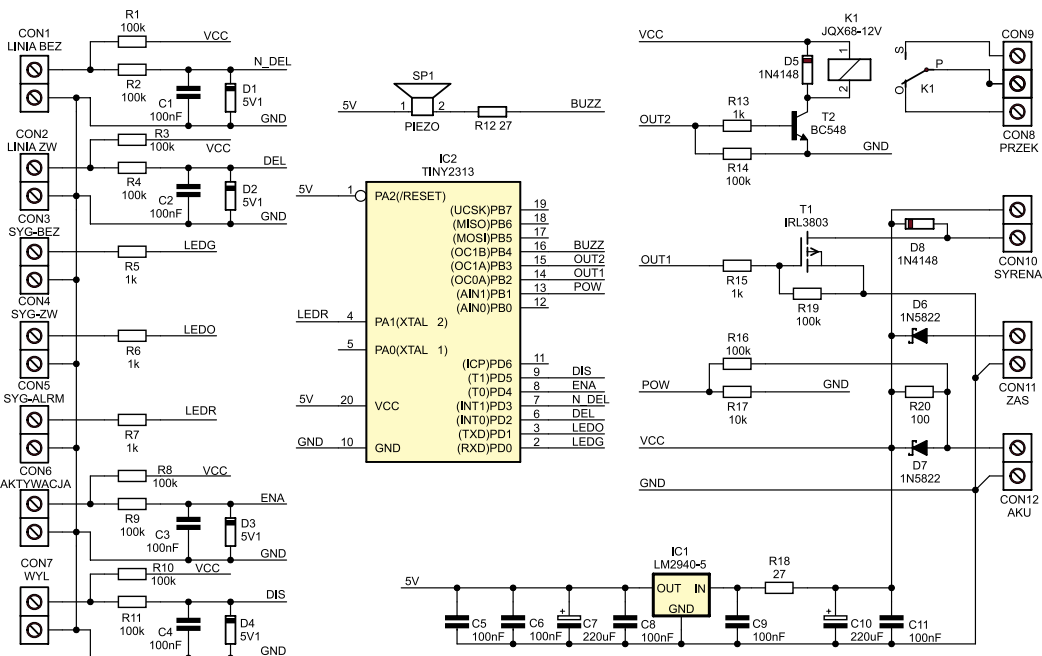


**Fig. 1** LED indication of device statuses

minute and then for as long as any of the trigger lines are violated. The unit can be deactivated at any time by short-circuiting the deactivation input to GND. Circuit requires a power supply in the range 8-15 VDC. Optionally, a rechargeable battery can also be included to act as a source of emergency power supply.

Schematic diagram of the unit is shown in Figure 2. Operation of the device is controlled by a program contained in the Attiny2313 microcontroller's memory. It is supplied by an energy-efficient stabiliser LM2940. The trigger lines and the

activation and deactivation input are protected against faults, with a set of RC elements and Zener diodes. Resistors R16 and R17 form a divider to measure the voltage of the battery supplying emergency power, and resistor R20 determines the charging current. Arrangement of connectors and descriptions of their function are shown in Figure 3.



**Fig. 2** Schematic diagram of the alarm unit

# Mounting and start-up

Mounting diagram of the unit is shown in Fig. 4. The circuit is made of typically assembled through-hole components, so even less experienced users will succeed in making it. Once assembled, the unit must be connected as shown in Figure 3. Connect any ordinary button to the activation input - a single press activates the unit. A key switch or code lock, for example, can be connected to the deactivation input. Activation and deactivation inputs can be linked together, in which case switching the unit on and off will be done in the same way. In standby, the trigger lines are normally short-circuited - a small current flows in them. All sensors must be connected in series, as shown in Figure 5. Tripping of any sensor breaks the circuit and activates the alarm. An additional advantage of this connection is that attempting to disconnect the sensor circuit from the unit will also trigger the alarm. Two alarm

outputs are available. On the first of these, in the alarm state, there is a supply voltage, i.e., approx. 12 V, intended for connection to an audible or other signalling device with a maximum current consumption of 3 A. The second output is a relay contact that can be used to switch any circuit, e.g., supplied with 230 VAC mains voltage. The device has low standby power consumption (less than 2 mA), so it can successfully operate powered by a photovoltaic cell, for example, as an outdoor area alarm. The excess energy will recharge the battery, which in turn will power the device at night. Just bear in mind that the circuit has no protection against overcharging the battery, so the power supply battery source and charging current must be selected (by changing the value of resistor R20) to prevent this situation.

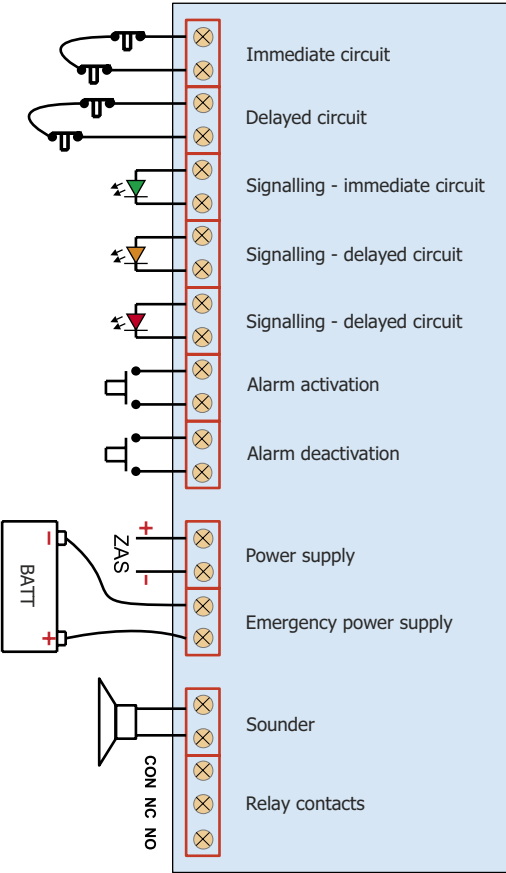


Fig. 3 Layout and function of connectors

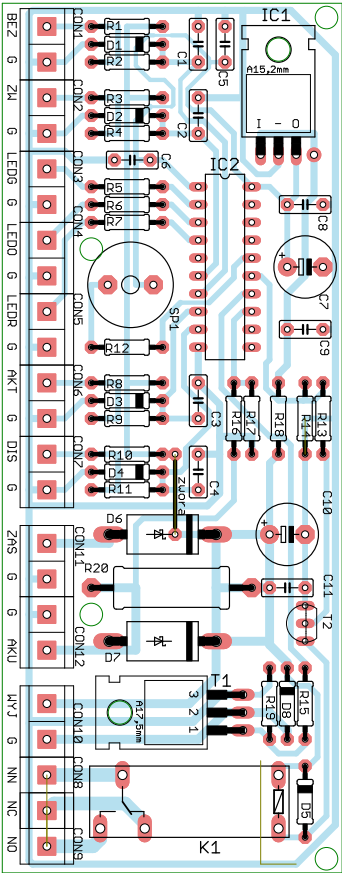
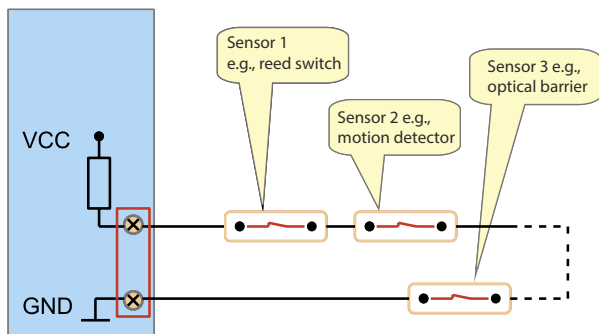


Fig. 4 Mounting diagram of the alarm unit



**Fig. 5** Connection of sensors to the alarm unit

## List of components

### Resistors:

R1-R4, R8-R11, R14, R16, R19: .....100 kΩ  
 R5-R7, R13, R15: .....1 kΩ  
 R12, R18: .....27 Ω  
 R17: .....10 kΩ  
 R20: .....100 Ω / 2 W

### Capacitors:

C1-C6, C8, C9, C11: .....100 nF  
 C7, C10: .....220 uF / 25 V

### Semiconductors:

D1-D4: .....Zener diode 5.1 V  
 D5, D8: .....1N4148  
 D6, D7: .....1N5822  
 T1: .....IRL3803 or similar  
 T2: .....BC548 or similar  
 IC1: .....LM2940-5  
 IC2: .....ATTiny2313

### Other:

Jumper: .....silvered wire  
 K1: .....relay 12 V  
 SP1: .....piezo transducer with generator  
 Connectors:..ARK2/500×10 pcs, ARK3/500×1 pcs.



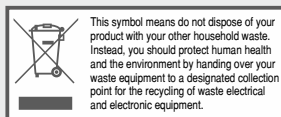
Start mounting from soldering the components onto the board in order of size from smallest to largest.

Photographs of the mounted kit may be helpful.



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 The self-assembly kits are intended for educational and demonstration purposes only. They are not intended for use in commercial applications. If they are used in such applications, the purchaser assumes all responsibility for ensuring compliance with all regulations