...going one step further

Set of Components for Electronics Experiments 1018532

Instruction manual

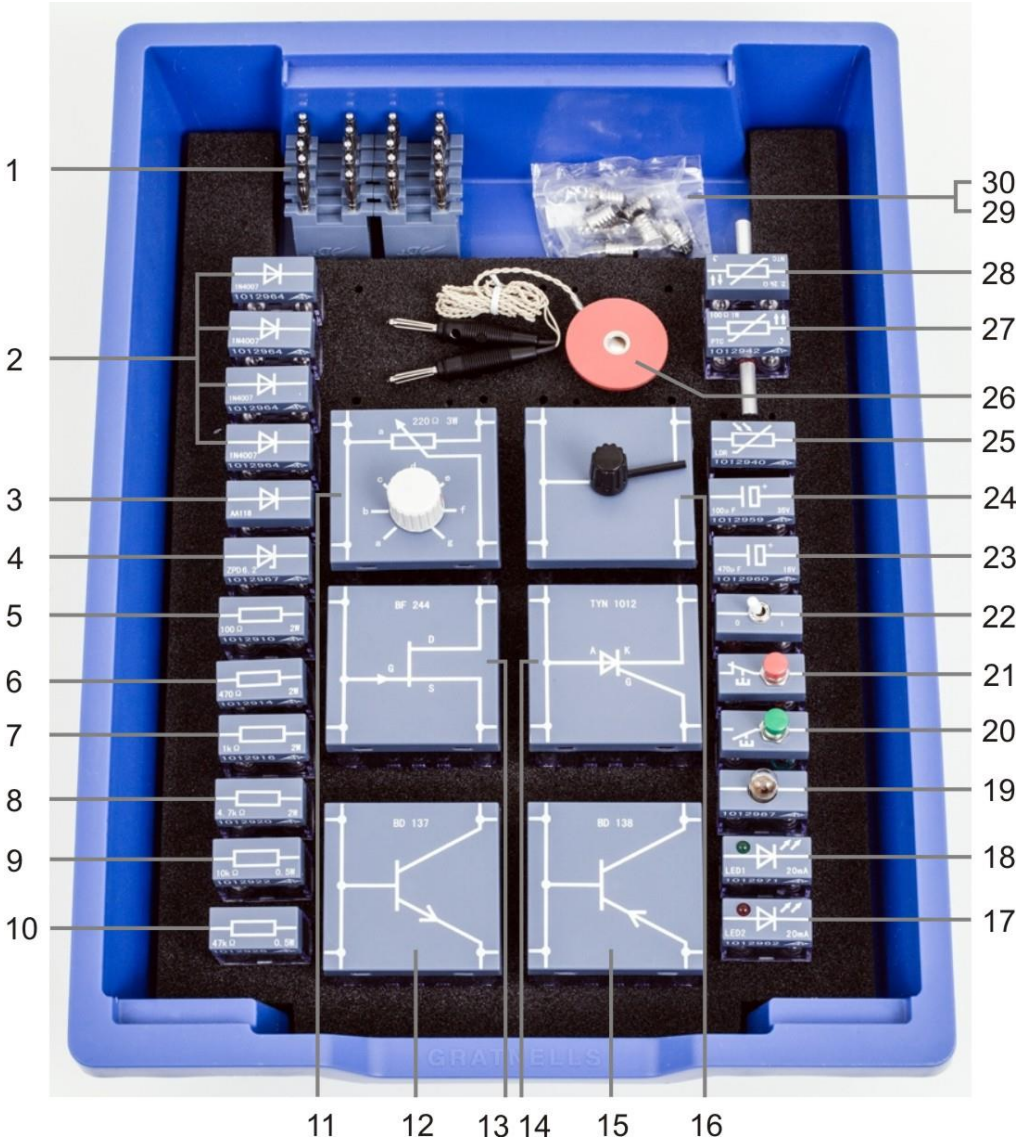
05/15 UD

1. Safety instructions

Safe operation of these components is assured as long as they are used as stipulated. Safety cannot be guaranteed if they are handled incorrectly or carelessly.

If there is any likelihood that the equipment can no longer be operated without hazard (e.g. if there is visible damage), the component in question must immediately be put out of use.

2. Equipment supplied



1 Set of 10 jumpers
2 Silicon diodes, 1N 4007 (4x)
3 Germanium diode, AA118
4 Zener diode, ZPD 6.2
5 Resistor, 100 Ω, 2 W
6 Resistor, 470 Ω, 2 W
7 Resistor, 1 kΩ, 2 W
8 Resistor, 4.7 kΩ, 2 W
9 Resistor, 10 kΩ, 2 W
10 Resistor, 47 kΩ, 2 W
11 Potentiometer, 220 Ω, 3 W
12 NPN transistor, BD 137
13 FET, BF 244
14 Thyristor, TYN 1012
15 PNP transistor, BD 138
16 Single-pole change-over switch
17 LED, red
18 LED, green
19 Lamp socket, E10, facing upwards
20 Single-pole push-button, normally open
21 Single-pole push-button, normally closed
22 Single-pole toggle switch
23 Electrolytic capacitor, 470 µF, 16 V
24 Electrolytic capacitor, 100 µF, 35 V
25 Photoresistor, LDR 0.5
26 Earpiece speakers
27 PTC thermistor, 100 Ω
28 NTC thermistor, 2.2 kΩ
29 Set of 10 bulbs, 4 V, 40 mA
30 Set of 10 bulbs, 12 V, 100 mA

3. Technical data

Dimensions	430x310x80 mm
Weight	1.9 kg approx.

4. Description

Collection of components for carrying out basic experiments on the subject of electronics using a plug-in component board. Contained in rugged plastic box with foam inlay featuring recesses matching the shapes of the components.

5. Sample experiments

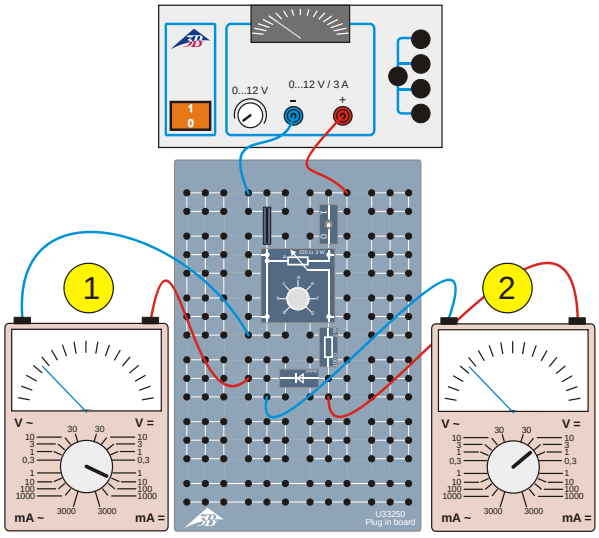
Required equipment:

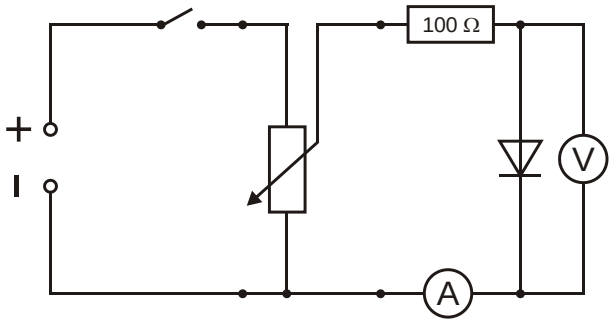
1 Set of components for electronics experiments	1018551
1 Plug-in board for components	1012902
2 Analog multimeter, ESCOLA 30	1013526
1 Set of 15 experiment leads, 75 cm	1002840
1 AC/DC power supply, 0 – 12 V, 3 A @230 V	1002776
or	
1 AC/DC power supply, 0 – 12 V, 3 A @115 V	1002775
1 Tea candle	
1 Cigarette lighter or box of matches	

5.1 Characteristic of a silicon diode

Investigate a silicon diode in the forward-bias direction.

Record the characteristic for a silicon diode.

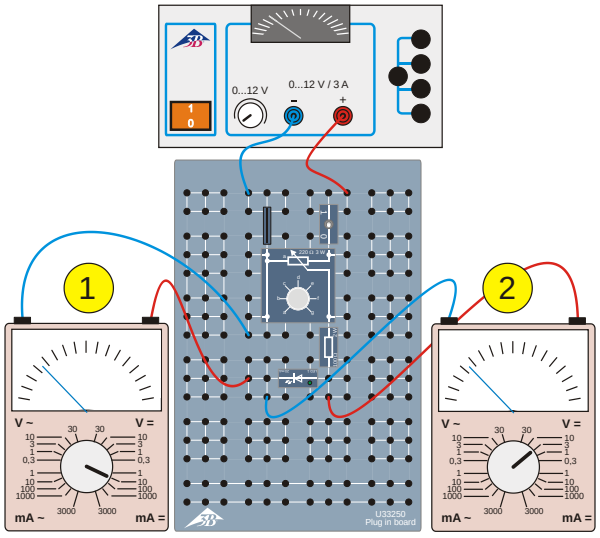


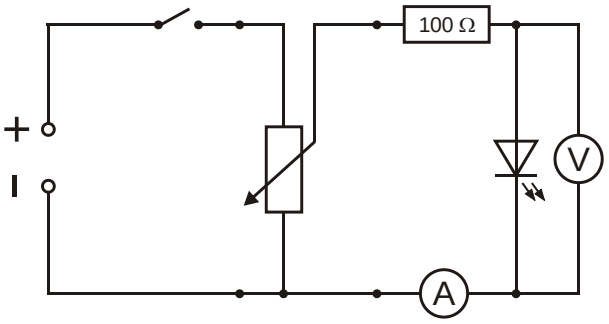


5.2 Characteristic of an LED

Check the forward-bias voltage of a LED.

Record characteristics for a green LED and a red LED.

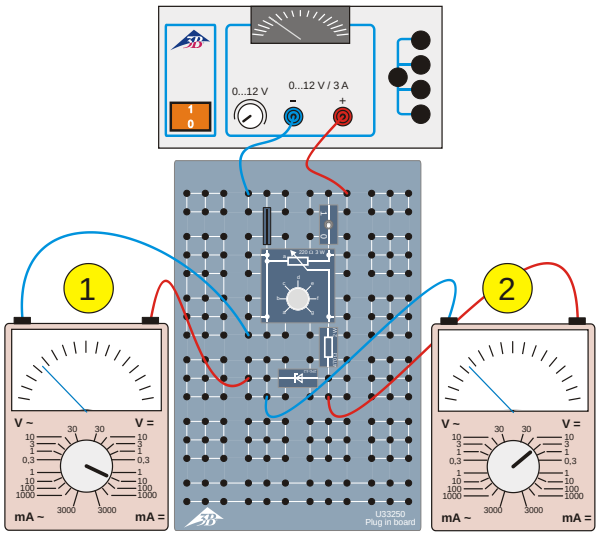


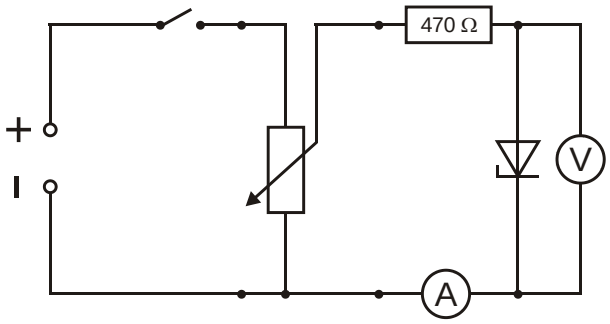


5.3 Characteristic of a zener diode

Investigate a zener diode in the forward-bias direction.

Record the characteristic for a zener diode and compare it with that of a normal silicon diode.

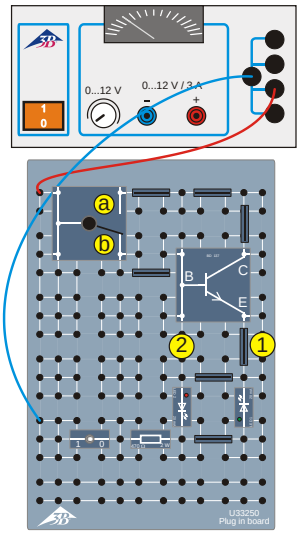


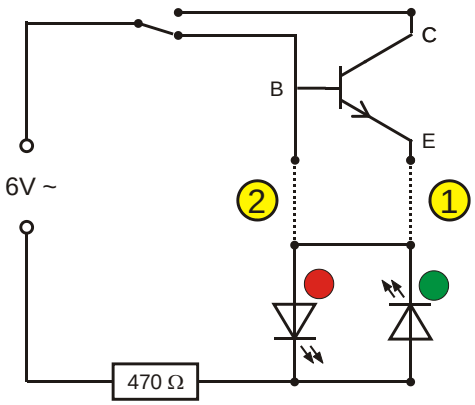


5.4 Transistors

Set up a test circuit for a transistor.

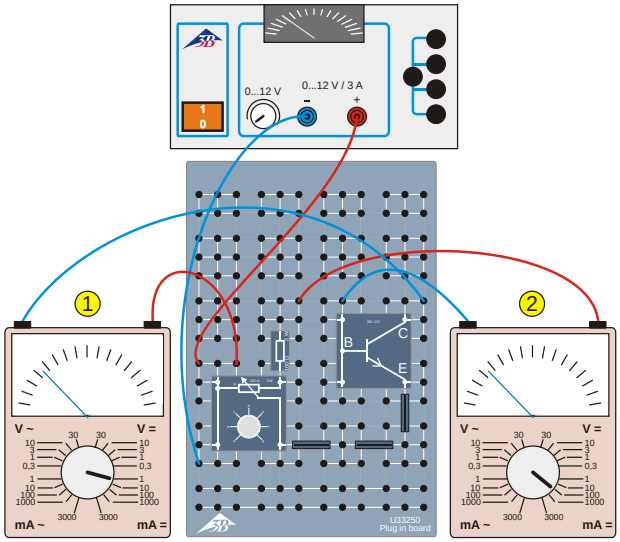
Check how current flows through a transistor.

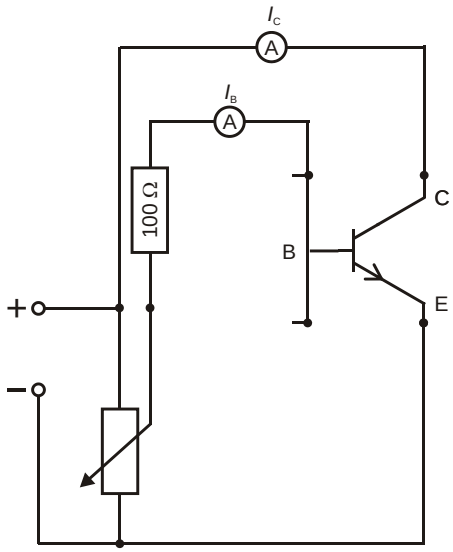




5.5 Characteristic of a transistor

Investigate how the collector current I_C depends on the base current I_B.

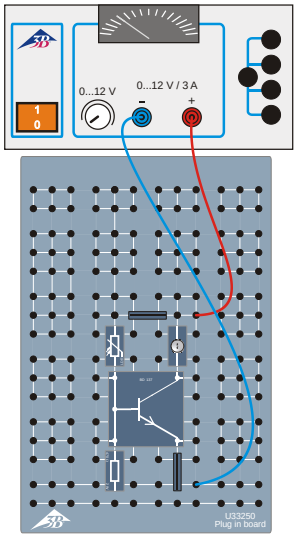


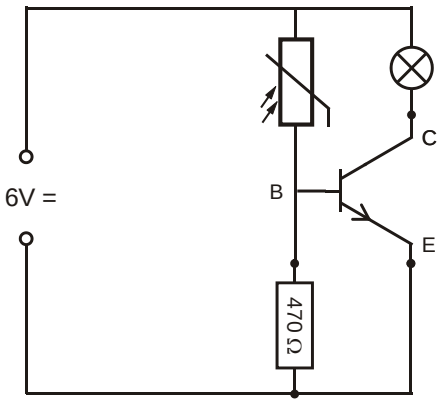


5.6 LDR photoresistors

Investigate the resistance of an LDR photoresistor as a function of the intensity of light incident upon it.

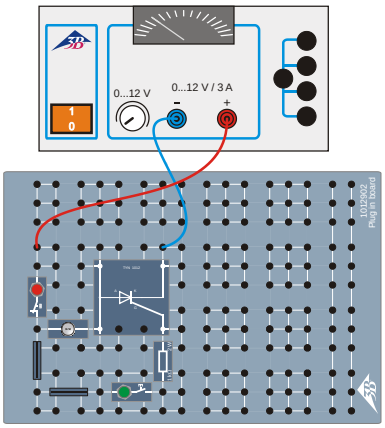
Observe the brightness of a bulb.

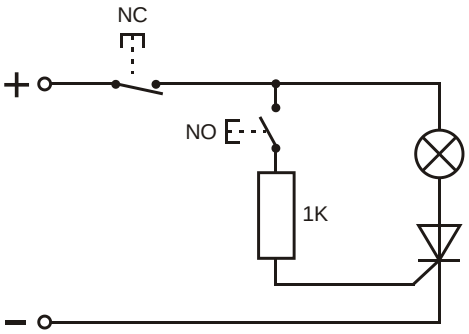




5.7 Thyristors in DC circuits

How a thyristor works in a DC circuit.

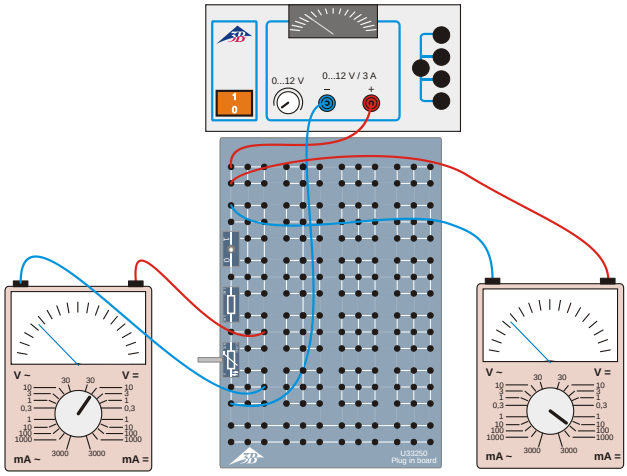


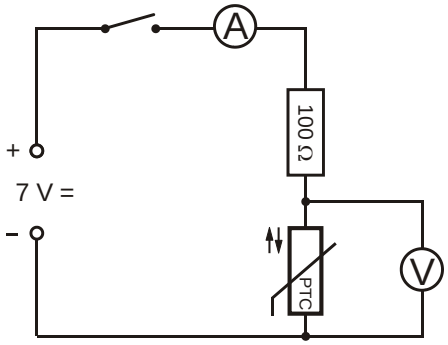


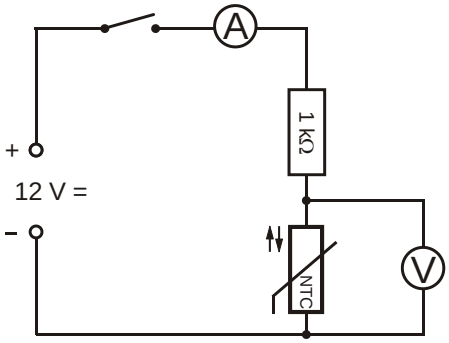
5.8 Temperature response of an NTC thermistor and a PTC thermistor

Investigate the resistance of an NTC thermistor and a PTC thermistor as a function of temperature.

Plot the resistance of NTC and PTC thermistors as a function of temperature on a graph.

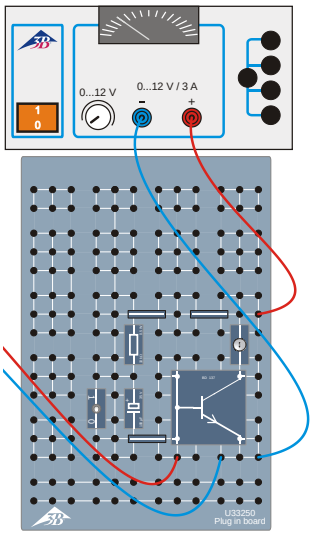


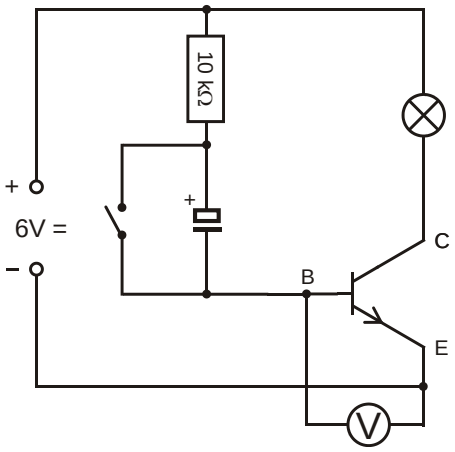




5.9 Delayed switching

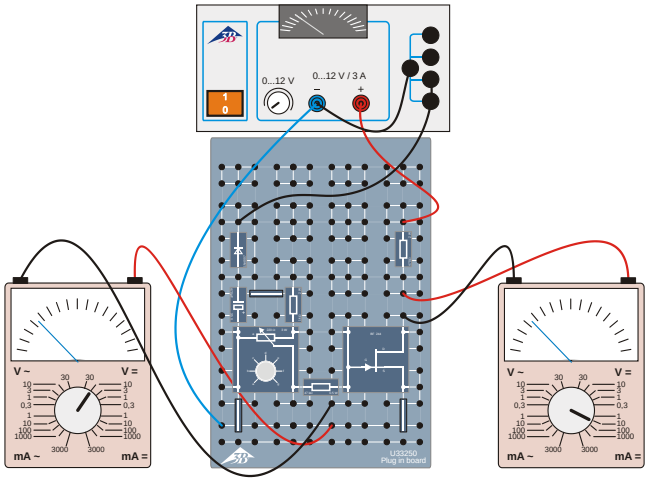
Set up a circuit to investigate delayed switching.

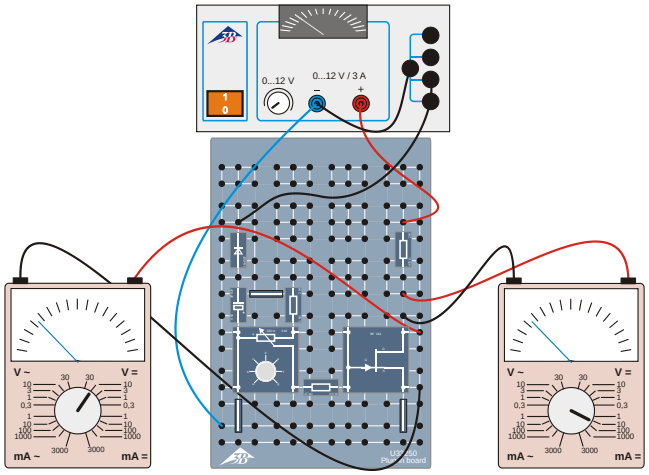


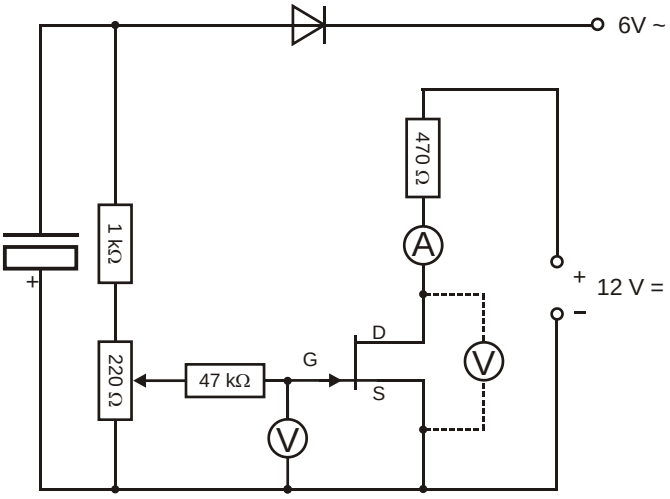


5.10 Characteristics of a field effect transistor

Record the drain current I_D of an FET as a function of the drain-source voltage V_{DS} for various gate-source voltages V_{GS}.

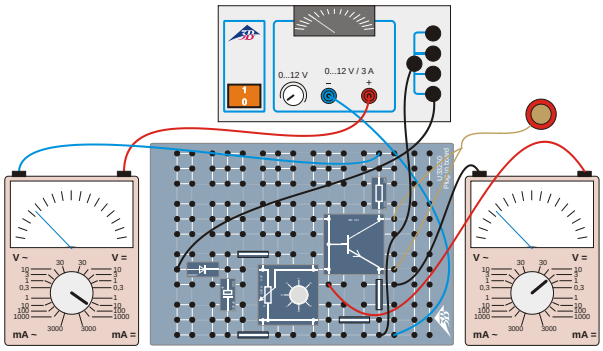


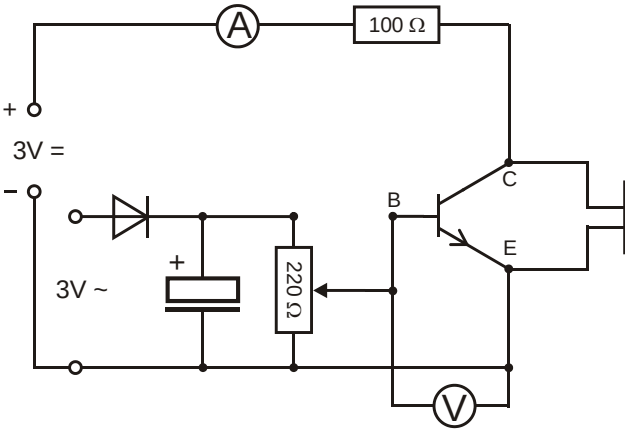




5.11 Checking for mains hum

Set up a pulsating DC circuit in which the AC component is amplified and made audible.





6. Storage and disposal

- Store the component set in a clean, dry and dust-free place.
- The packaging should be disposed at local recycling points.
- If the components themselves are to be disposed of, they should not be included with normal domestic waste, but should be deposited in special containers provided for electrical refuse. Local regulations are to be observed.