

Changeover switches and alternate switches

(Item No.: P1372000)

Curricular Relevance



Difficulty



Easy

Preparation Time



10 Minutes

Execution Time



10 Minutes

Recommended Group Size



2 Students

Additional Requirements:

Experiment Variations:

Keywords:

Task and equipment

Information for teachers

Additional information

The first experiment should serve primarily to familiarise the students with the construction and function of changeover switches.

Following this, they use two changeover switches for alternate switching, and so become acquainted with the alternate switching they daily encounter.

Notes on setup and procedure

The voltage outlets of the power supply are connected to the right and left sides of the setup.

Remark

Changeover switches which are used in alternating circuits are also called alternating switches, because of the function they fulfill.

Changeover switches and alternate switches

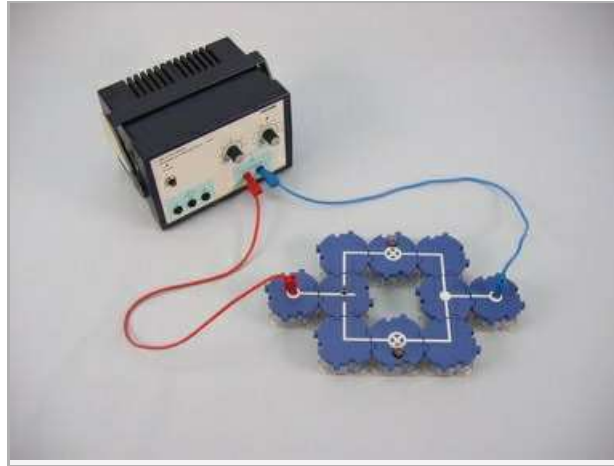
(Item No.: P1372000)

Task and equipment

Task

How do changeover switches and alternate switches work?

Determine how it is possible to switch between two electrical appliances in a circuit, and how alternate switches are connected.



Equipment



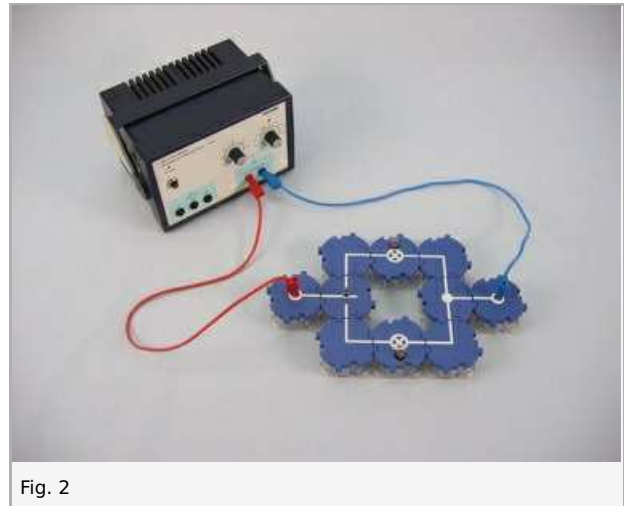
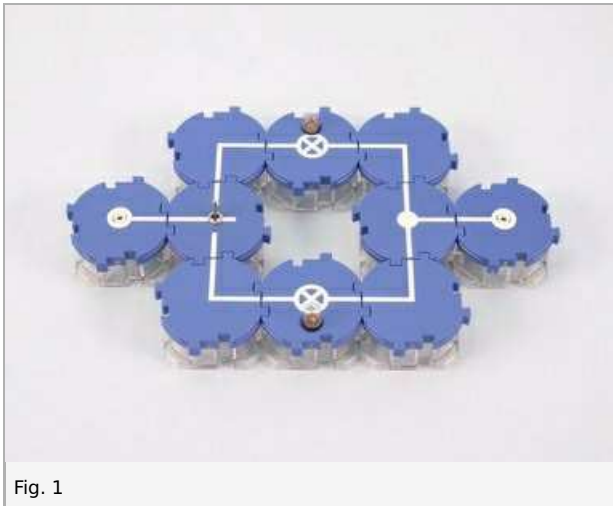
Position No.	Material	Order No.	Quantity
1	Straight connector module, SB	05601-01	1
2	Angled connector module, SB	05601-02	4
3	T-shaped connector module, SB	05601-03	1
4	Junction module, SB	05601-10	2
5	Change-over switch module, SB	05602-02	2
6	Socket module for incandescent lamp E10, SB	05604-00	2
7	Connecting cord, 32 A, 500 mm, red	07361-01	1
8	Connecting cord, 32 A, 500 mm, blue	07361-04	1
9	Filament lamps 12V/0.1A, E10, 10	07505-03	(2)
10	PHYWE power supply DC: 0...12 V, 2 A / AC: 6 V, 12 V, 5 A	13506-93	1

Set-up and procedure

Set-up

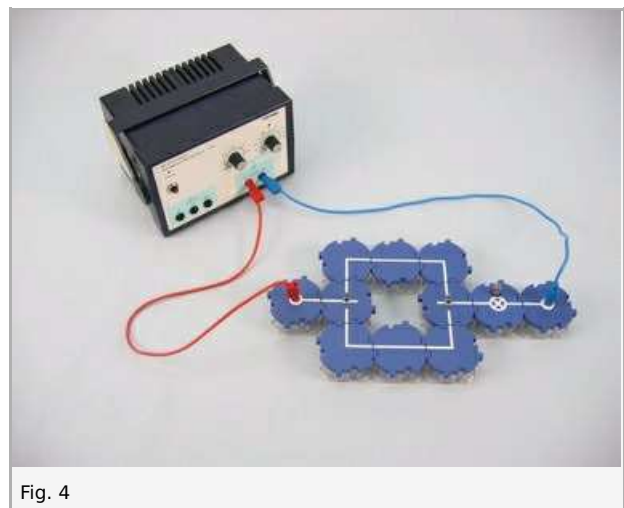
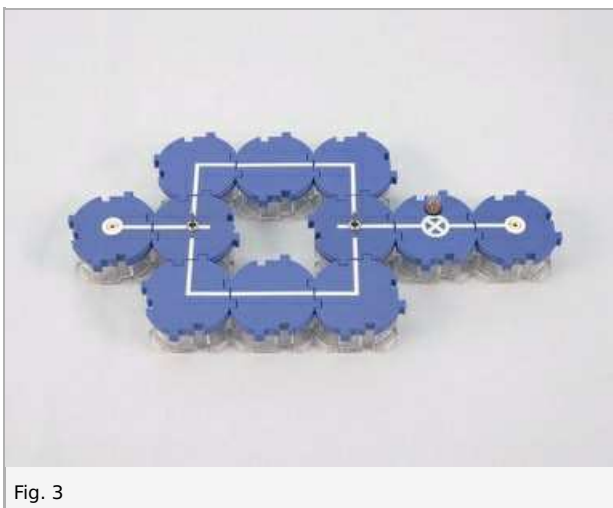
First experiment

Set up the circuit as shown in Fig. 1. Then, connect the power supply to the circuit as in Fig. 2.



Second experiment

Set up the circuit as shown in Fig. 3. Then, connect the power supply to the circuit as in Fig. 4.



Procedure

First experiment

- Set the power supply to 0 V, switch it on and adjust the voltage to the 12 V rated voltage of the lamp. Close the switch, observe the lamp and note what you observe in the report.
 - Repeatedly operate the changeover switch and observe the behaviour of the lamp. Note what you observe.
 - Set the power supply to 0 V and switch it off.
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Second experiment

- Switch on the power supply and adjust it to the 12 V rated voltage of the lamp. Successively operate the changeover switches in any way you want, while observing the behaviour of the lamp.
- Note what you observe under Results - Observation 2 in the report.
- Set the power supply to 0 V and switch it off.

Report: Changeover switches and alternate switches

Results - Observation 1

Write down your observations of the first experiment.

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Results - Observation 2

Write down your observations of the second experiment.

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Evaluation - Question 1

Describe the construction and mode of action of a changeover switch.

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Evaluation - Question 2

The switching which you carried out in the second experiment is called alternate switching. What is its most important advantage (you can derive it from the observations 2)?

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Evaluation - Question 3

Name an example of the use of alternate switching.

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