

15

FREE

diagrams



Electrical Diagrams

19 pages

Reading only



1 switch



2 switches



Panel

Electrical work? Call a licensed electrician

glooux.com

15



START HERE

How to use this guide

19 pages

Reading only



SAFETY FIRST

- This guide teaches you to **read** electrical diagrams. It does not teach you to install, repair or open anything.
- A drawing simplifies a real circuit and says nothing about your own home.
- For any work on wiring, outlets, switches or the panel, hire a **licensed electrician** (qualified electrician in the UK; licensed electrician in Australia).
- Rules, voltages and wire colors change between countries and between old and new homes. Local rules always win.

Each page covers one diagram: what you are seeing, the symbols, how to read it, and one caution. Start with the symbols page, then go in order.

1. What you are seeing
2. The symbols
3. How to read it, in three points
4. A caution to remember



Reading guide, not installation instructions. Call a licensed electrician.

Study material. Electrical rules and wire colors vary by country: follow your local code.

Aa



SYMBOLS

The symbols

WHAT YOU ARE SEEING

Every diagram in this guide uses the same few drawings. Learn these twelve and you can follow the rest.



Switch (open)



Light



Outlet



Ground



Hot wire



Neutral wire



Breaker



Dimmer



Ceiling fan



Smart (radio)



Half-switched outlet



GFCI

HOW TO READ IT

- A circle with an X is a **light**. A circle with two short bars is an **outlet**. A circle with blades is a **ceiling fan**.
- A line with a gap and a tilted blade is a **switch**. Open gap means off. An arrow on it means **dimmer**; radio arcs mean **smart**.
- A black line is **hot**, a gray line is **neutral**, a green dashed line is **ground**.



Caution: Wire colors differ between countries and in older homes. A drawing never tells you what a real wire is.

Other countries: UK/AU: earth = ground, live = hot

01

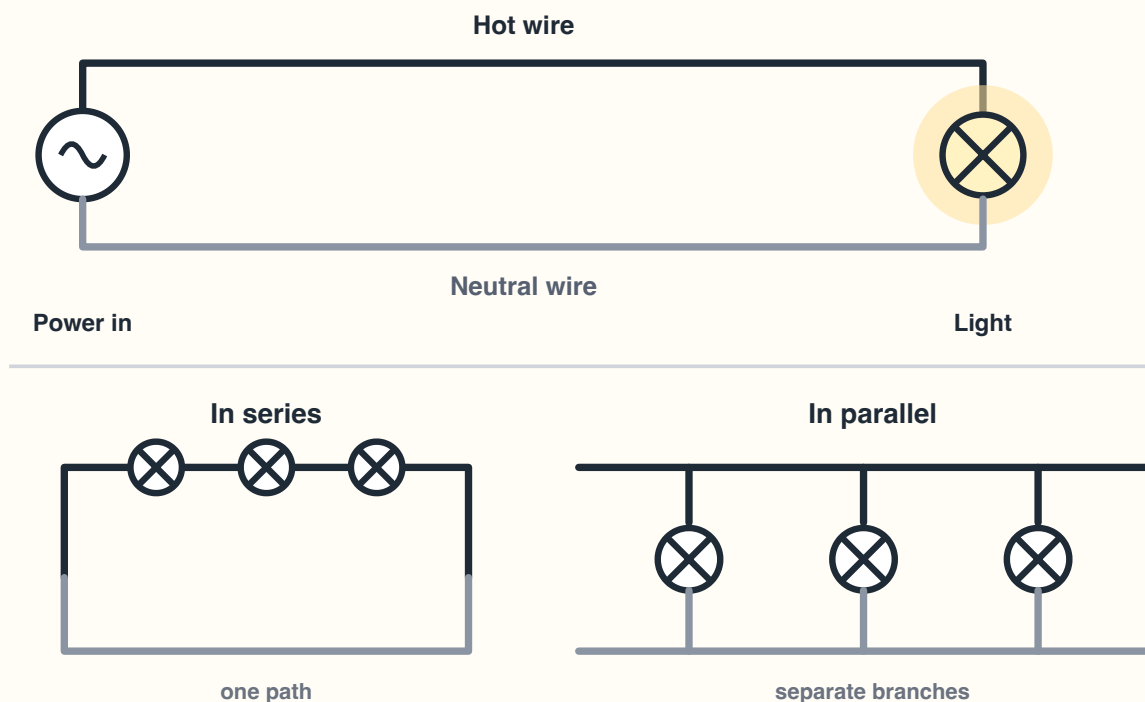


DIAGRAM 1 OF 15

The basic circuit

WHAT YOU ARE SEEING

Every circuit is a loop: a source, a load such as a light, and a path back. The other fourteen pages build on this one.



HOW TO READ IT

- Follow the black line from the source to the light. This is the hot line.
- The gray line is neutral. It leads back to the source and closes the loop.
- Below, **in series** puts lights on one path; **in parallel** gives each light its own branch. Homes are drawn in parallel.



Caution: A diagram simplifies a real circuit. It is for reading symbols, never for working on a home.

Other countries: UK/AU: live = hot

02

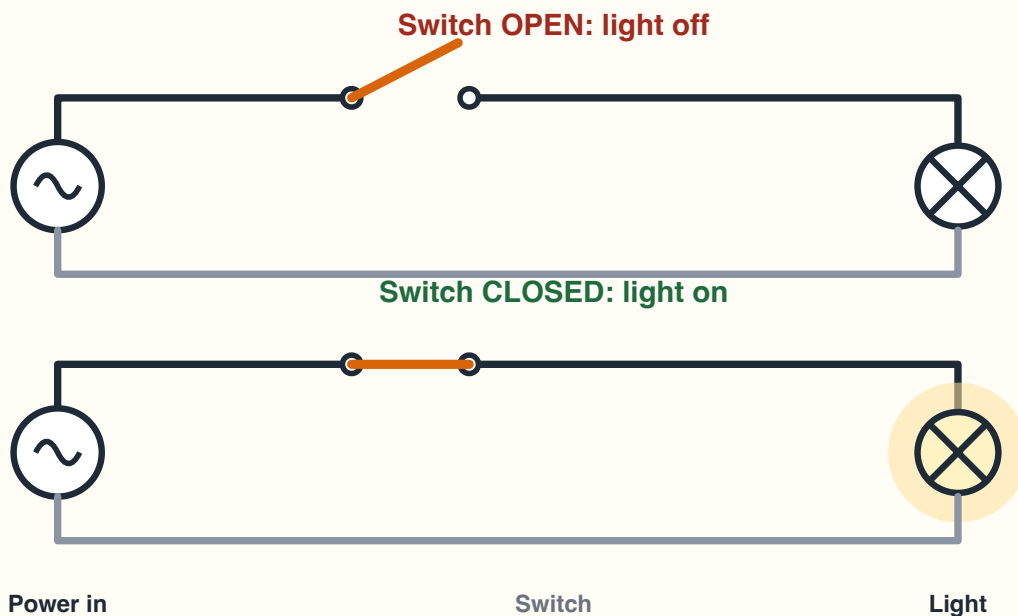


DIAGRAM 2 OF 15

Single-pole switch

WHAT YOU ARE SEEING

One switch controls one light from one place. It is the simplest circuit you will meet.



HOW TO READ IT

- Follow the black hot line from the power source. It must pass through the switch before it reaches the light.
- Switch open: the gap breaks the path, nothing flows, and the light is off.
- Switch closed: the path is complete, current flows through the light and returns on the gray neutral line.



Caution: A switch that is off does not make the wires behind it safe. Leave any work behind the plate to a licensed electrician.

Other countries: UK/AU: one-way switch

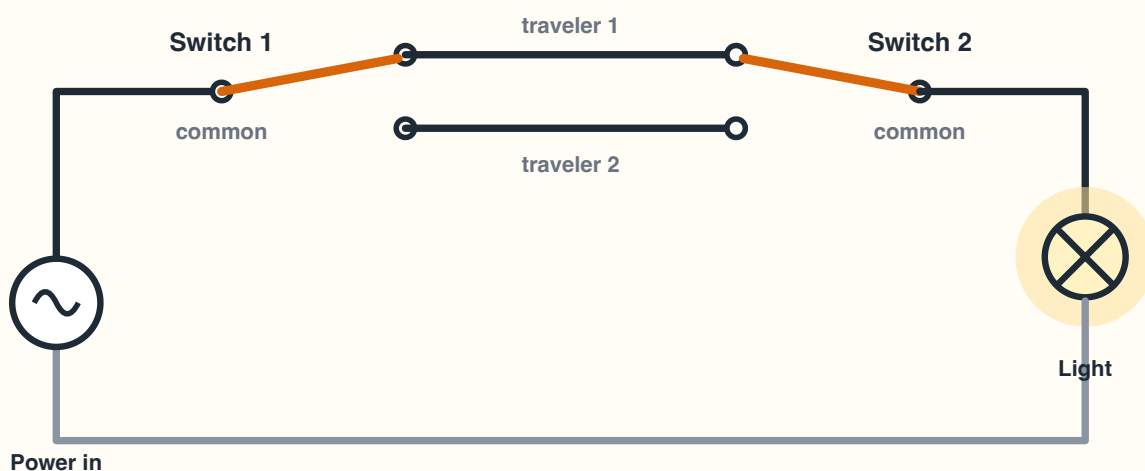
03

DIAGRAM 3 OF 15

Three-way switches

WHAT YOU ARE SEEING

Two switches control the same light, such as at the top and bottom of a staircase.



HOW TO READ IT

- Each switch has one **common** terminal and two **traveler** lines that link the two switches.
- The blade always touches one traveler. Flipping either switch moves the path to the other traveler, so the light changes state.
- Hot enters at the common of the first switch. The common of the second switch leads on to the light.



Caution: Three-way circuits are easy to misread. A wrong guess about a real circuit can mean shock or fire. Call a licensed electrician.

Other countries: UK/AU: two-way switching

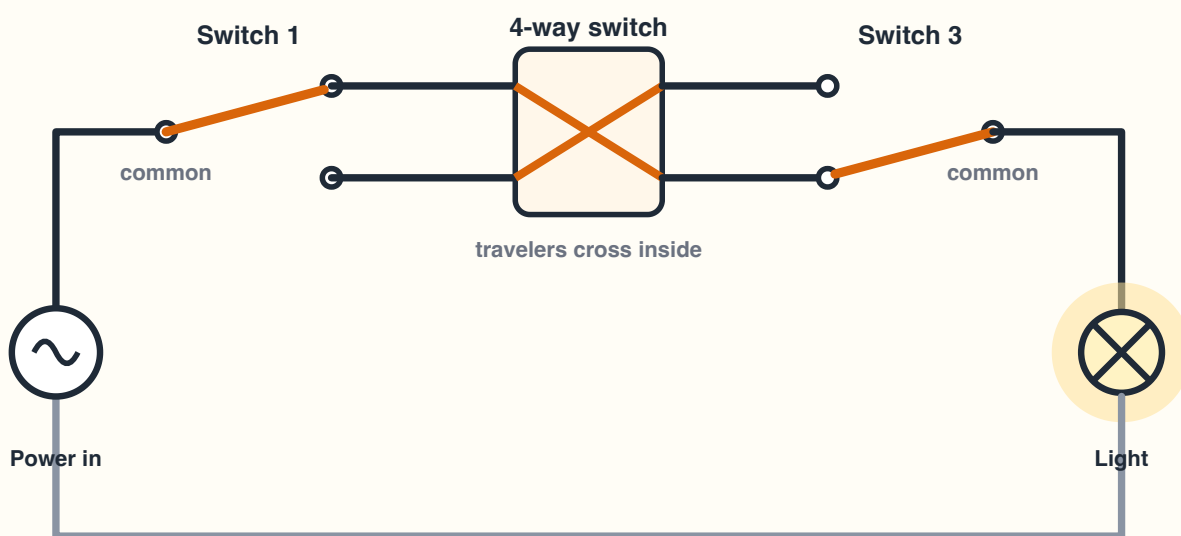
04

DIAGRAM 4 OF 15

Four-way switches

WHAT YOU ARE SEEING

Three or more switches control one light, as in a long hallway or a large room with several doors.



HOW TO READ IT

- The **4-way switch** sits between two three-way switches. It has two pairs of terminals.
- Inside, it either passes the travelers straight or crosses them, drawn as an X.
- Any switch can change the light, because each one can reroute the path.



Caution: Four-way drawings are easy to misread. This page is for learning symbols only.

Other countries: UK/AU: intermediate switch

05

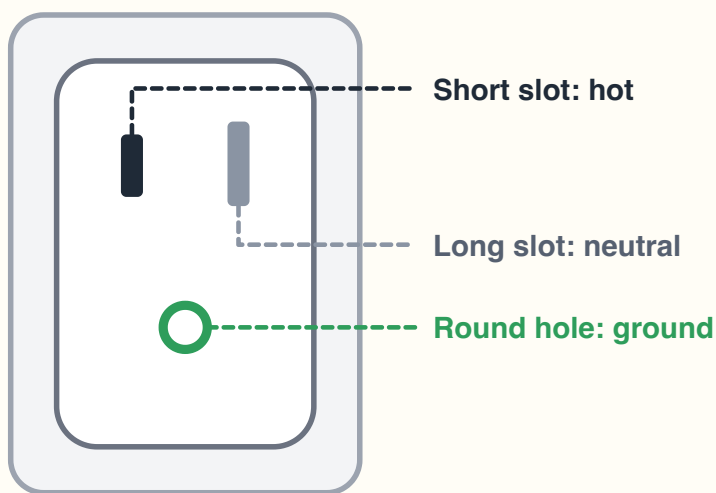


DIAGRAM 5 OF 15

A standard outlet

WHAT YOU ARE SEEING

An outlet gives plug-in devices access to power. The diagram shows what each opening is for.



HOW TO READ IT

- US outlet: the **short slot is hot**, the **long slot is neutral**, the round hole is **ground**.
- Ground is a safety path. It carries current only when something goes wrong.
- Older homes may have two-slot outlets with no ground hole.



Caution: A drawing cannot show the condition of a real outlet. Only a licensed electrician should judge or repair one.

Other countries: UK: socket, earth, live · AU: power point, earth, active

06

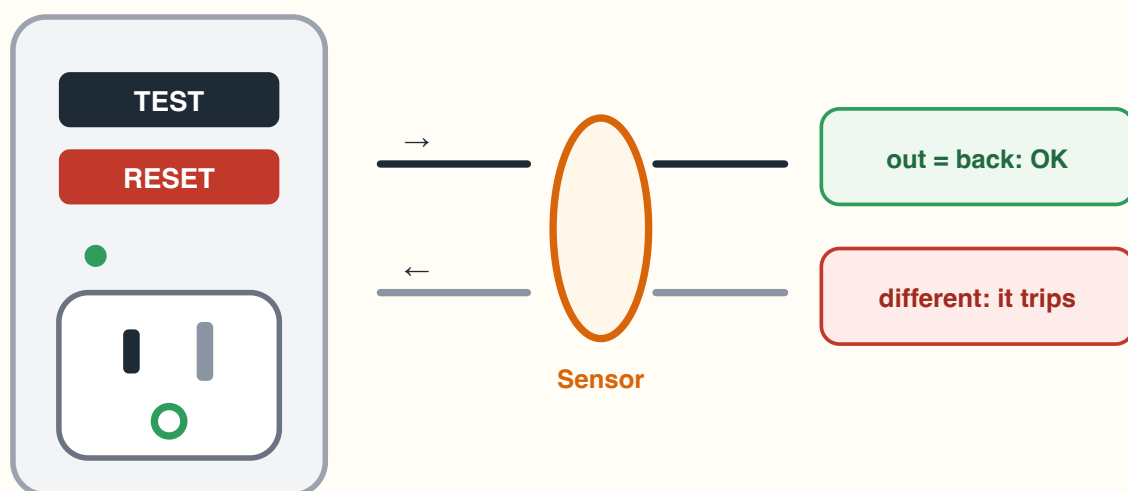


DIAGRAM 6 OF 15

GFCI outlet

WHAT YOU ARE SEEING

A GFCI outlet cuts power in a fraction of a second when current leaks where it should not, for example through water. It is drawn in kitchens, bathrooms and outdoor circuits.



HOW TO READ IT

- In the drawing, a sensor compares the current going out on the hot line with the current coming back on neutral.
- If the two differ, the symbol shows it tripping: power stops.
- The face of the device carries two buttons marked TEST and RESET. This page only names them.



Caution: A diagram cannot say what is wrong in a real home. For any concern about an outlet, call a licensed electrician.

Other countries: UK/AU: RCD or safety switch

07

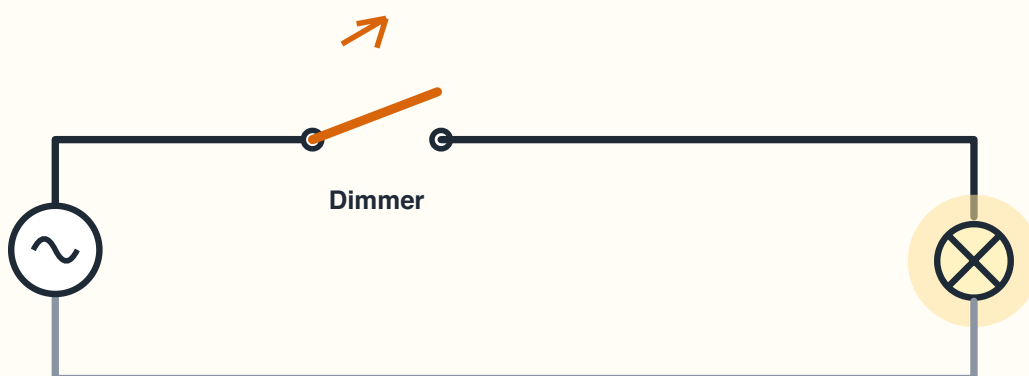


DIAGRAM 7 OF 15

Reading a dimmer

WHAT YOU ARE SEEING

A dimmer is a switch that also sets how much power the light receives.



MAX LOAD 150 W

Example of a label printed on the device

HOW TO READ IT

- The symbol is a switch with an arrow. The arrow means the setting is adjustable.
- Real dimmers carry a label with a maximum load in watts. The drawing shows an example label.
- The symbol is the same for any dimmable light; it does not say which types.



Caution: A drawing cannot tell you what suits a real home. Questions about dimmers go to a licensed electrician.

Other countries: UK/AU: dimmer switch

08

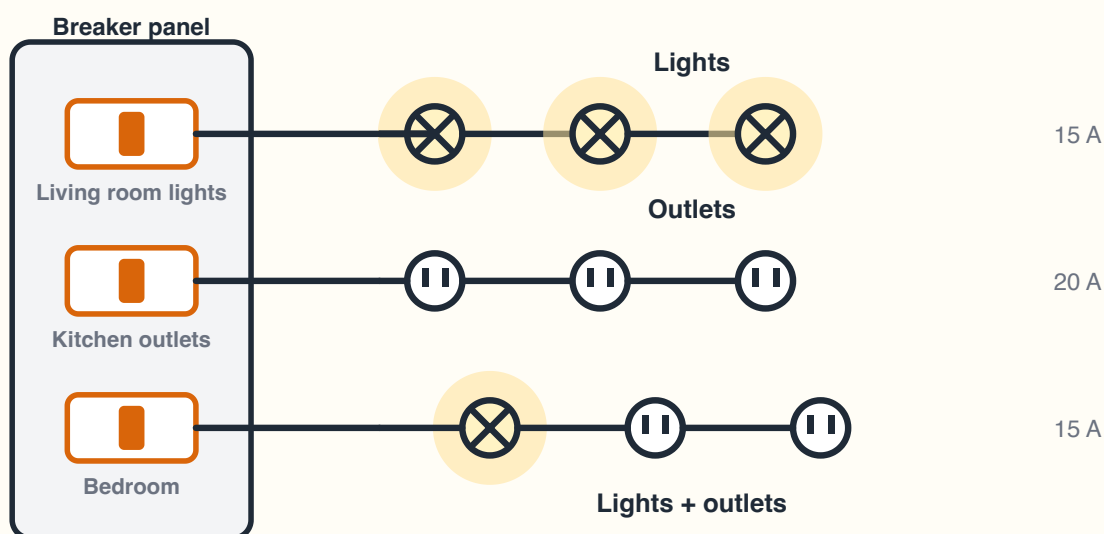


DIAGRAM 8 OF 15

A circuit map

WHAT YOU ARE SEEING

A home has several separate circuits. This map shows which lights and outlets share the same protection.



HOW TO READ IT

- Each breaker feeds one circuit. Everything drawn after it loses power when it trips.
- The number on the breaker (15 A, 20 A) is the most current that circuit may carry.
- Heavy appliances usually have their own circuit.



Caution: A map shows how circuits are grouped, not whether a real circuit is sound. Ask a licensed electrician about your own home.

Other countries: UK/AU: MCB (circuit breaker), 230 V

09



DIAGRAM 9 OF 15

Reading a panel directory

WHAT YOU ARE SEEING

The breaker panel is the control center of the home. Its directory tells you which breaker feeds which room.



Directory

1	Kitchen outlets	20 A
2	Living room lights	15 A
3	Bedroom	15 A
4	Bathroom GFCI	20 A
5	Hallway lights	15 A
6	Garage outlets	20 A

Cover stays closed

HOW TO READ IT

- The numbers on the directory match the numbered breakers.
- The big switch at the top is the **main breaker**. It controls the whole home.
- Each label names a room or a group of lights and outlets.



Caution: The panel cover is for licensed electricians only. This page teaches reading a directory, nothing more.

Other countries: UK: consumer unit · AU: switchboard

10

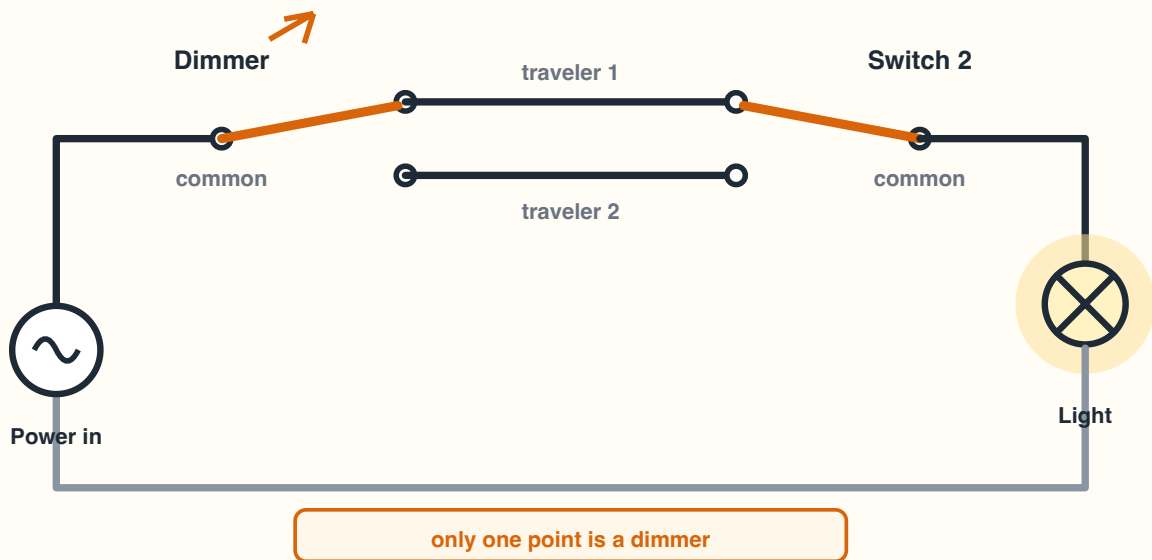


DIAGRAM 10 OF 15

Dimmer at two switch points

WHAT YOU ARE SEEING

A light can have two control points, one of them a dimmer. The drawing shows how the symbols sit in the same circuit.



HOW TO READ IT

- The switch with an arrow is the dimmer symbol. The other is drawn as an ordinary three-way switch.
- Both control points share the two traveler lines, as on the three-way page.
- The symbol shows that only one of the two points adjusts brightness.



Caution: The drawing is for reading symbols. Which parts go together in a real home is for a licensed electrician to decide.

Other countries: UK/AU: two-way dimming

11

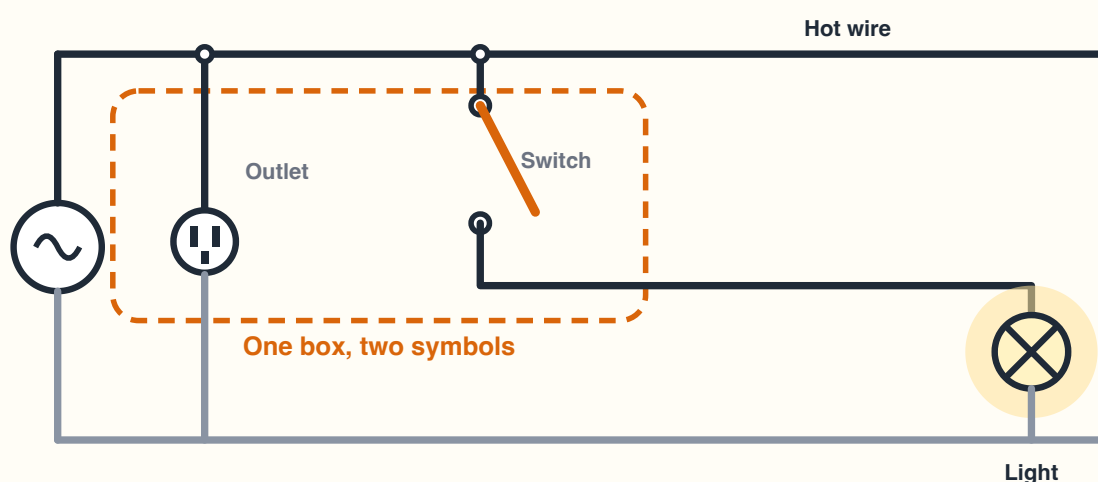


DIAGRAM 11 OF 15

Switch and outlet in one box

WHAT YOU ARE SEEING

Some walls have a switch and an outlet side by side under one cover plate. The drawing shows they are two separate parts of a circuit.



HOW TO READ IT

- The dashed outline marks the single box. Inside it are two symbols: a switch and an outlet.
- The switch sits on the path to the light. The outlet hangs between the hot and neutral lines.
- Sharing a box does not mean sharing a path: in the drawing the outlet stays powered whatever the switch does.



Caution: A shared box is not a shared circuit. A drawing cannot judge a real wall; ask a licensed electrician.

Other countries: US: combination device · UK: a double back box is the deep box behind the plate

12

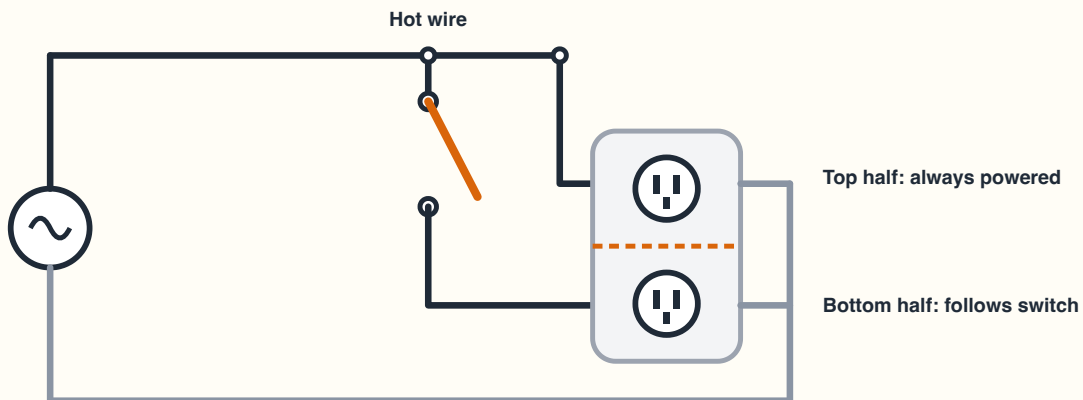


DIAGRAM 12 OF 15

Outlet with one half on a switch

WHAT YOU ARE SEEING

One outlet of a pair follows a wall switch while the other stays powered. The drawing shows two branches.



HOW TO READ IT

- The top half connects straight to the hot line: always powered.
- The bottom half passes through the switch first, so it follows the switch.
- Both halves return on the same neutral line.



Caution: Which half is switched cannot be told by looking at a real outlet. Leave that judgement to a licensed electrician.

Other countries: US: split receptacle, half-switched outlet

13

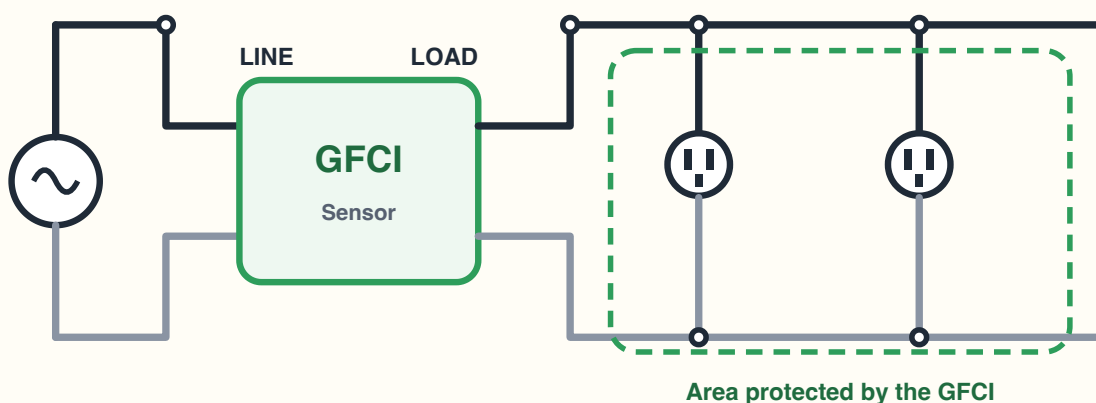


DIAGRAM 13 OF 15

One GFCI protecting the next outlets

WHAT YOU ARE SEEING

Compared with the single GFCI page, this drawing shows protection reaching outlets that come after the GFCI.



HOW TO READ IT

- The symbol has two sides: LINE is the input and LOAD is the output, as drawn.
- Outlets drawn after LOAD sit inside a dashed green area: the area the GFCI protects.
- Anything drawn before the GFCI sits outside that area.



Caution: A diagram does not say which wire belongs to which side of a real device. That is work for a licensed electrician.

Other countries: US: GFCI with LINE and LOAD · UK: RCD, drawn at the consumer unit · AU: safety switch (RCD) at the switchboard

14

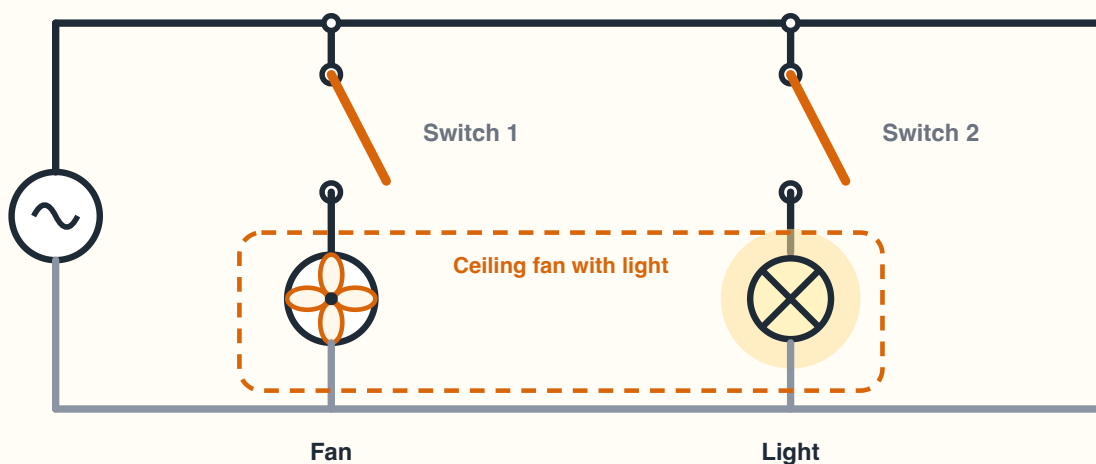


DIAGRAM 14 OF 15

Ceiling fan with light, two switches

WHAT YOU ARE SEEING

A ceiling fan with a light has two separate loads. The drawing shows each on its own switch.



HOW TO READ IT

- Two branches leave the hot line. Each has its own switch.
- One branch ends at the fan symbol, a circle with blades. The other ends at the light symbol.
- Both branches return to the same neutral line.



Caution: A drawing shows loads, not weight or mounting. Anything to do with a real ceiling fan belongs to a licensed electrician.

Other countries: US: fan with light kit · UK/AU: ceiling fan with light

15

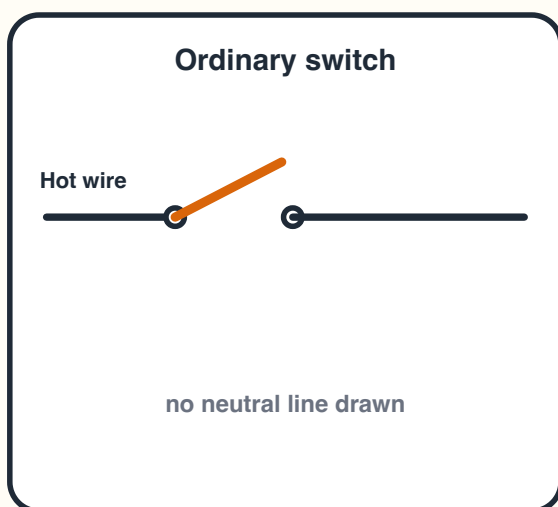
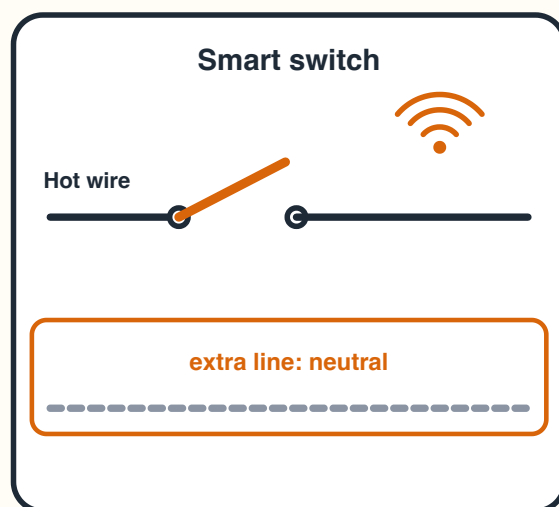


DIAGRAM 15 OF 15

Smart switch symbol

WHAT YOU ARE SEEING

A smart switch is drawn like an ordinary switch with two extra marks: radio arcs and a neutral line.



HOW TO READ IT

- The radio arcs show it connects wirelessly.
- The drawing shows an extra gray line, the neutral, that the ordinary switch beside it does not have.
- The rest of the loop reads exactly as on the single-pole page.



Caution: This page teaches the symbol only. It says nothing about any home or product; ask a licensed electrician.

Other countries: US: smart switch · UK: smart switch · AU: smart switch



KEEP THIS PDF

Where to go next

Try the free quiz to test what you learned, and keep this PDF on your phone to check a symbol when you see one.

GLOSSARY: US, UK AND AUSTRALIA

US	UK	Australia
switch	switch	switch
outlet (receptacle)	socket	power point
ground	earth	earth
hot	live	active
neutral	neutral	neutral
three-way switch	two-way switch	two-way switch
four-way switch	intermediate switch	intermediate switch
GFCI	RCD	safety switch (RCD)
circuit breaker	MCB	circuit breaker
panel	consumer unit	switchboard
120 V	230 V	230 V
dimmer	dimmer switch	dimmer
split receptacle (half-switched)	as drawn	as drawn
GFCI with LINE / LOAD	RCD at consumer unit	safety switch (RCD) at switchboard
smart switch	smart switch	smart switch

In the US, homes usually have 120 V outlets. The UK and Australia use about 230 V.

WHERE THE DIAGRAMS START



1 switch



2 switches



Panel

THIS GUIDE IS FREE IN



English

Español

Français

Italiano

Português

Deutsch

glooux.com



Free study guide for reading diagrams. It is not installation or repair instructions, not a course and not a certificate. Rules, voltages and wire colors vary by country and by home. Always follow local rules and hire a licensed electrician for any electrical work.