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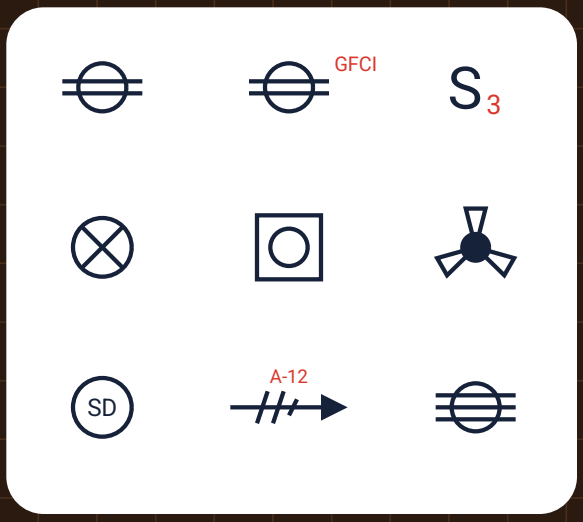
FREE PRINTABLE GUIDE · US ELECTRICAL DRAWINGS

60+ SYMBOLS EXPLAINED

HOW TO READ ELECTRICAL DRAWINGS

Floor plans, wiring diagrams, schematics and one-line diagrams, made simple

- Outlet, switch and lighting symbols
- Home runs, switch legs and circuit numbers
- NEMA symbols: contacts, coils, motors
- One-line diagram and panel schedule
- Quiz with answers to practice

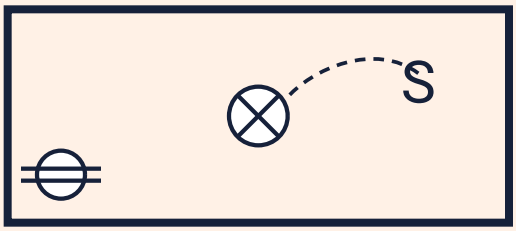


QUICK READING GUIDE

THE 4 KINDS OF ELECTRICAL DRAWINGS

Before reading symbols, know which drawing you are looking at.

FLOOR PLAN



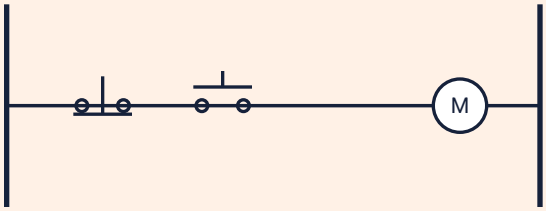
Shows WHERE each outlet, switch and light goes in the house. Used to install.

WIRING DIAGRAM



Shows HOW each wire connects, with real colors and terminals. Used to wire.

SCHEMATIC (LADDER)



Shows how the circuit WORKS: contacts, coils and loads in rungs. Used to troubleshoot.

ONE-LINE



Shows the power path in one line: utility, meter, panels, big loads. Used to plan.

SAFETY FIRST
Breaker off, test before touching

NEC / ANSI
Common US symbols

PRO TIPS
From the field

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Free guide

Study guide. Symbols vary between drafters: always check the legend on the drawing. Electrical work must follow the NEC and local codes.

QUICK READING GUIDE

OUTLET SYMBOLS

Receptacles on a US floor plan (ANSI style)



Duplex receptacle

Standard 120 V outlet, 2 plugs



GFCI receptacle

Ground-fault protected: baths, kitchens, outdoors



Weatherproof receptacle

Outdoor outlet with in-use cover



Switched receptacle

Half (or all) of the outlet controlled by a switch



Quad receptacle

Four plugs: two duplex in one box



240 V receptacle

Range, dryer or welder outlet



Floor receptacle

Outlet in a floor box



Tamper-resistant

TR outlet, required in homes (NEC 406.12)

Study guide. Symbols vary between drafters: always check the legend on the drawing. Electrical work must follow the NEC and local codes.

QUICK READING GUIDE

SWITCH SYMBOLS

The letter S is a switch: the small mark tells the type

S

Single-pole switch

Controls a light from one place

S_3

3-way switch

Two switches control the same light

S_4

4-way switch

Third (or more) control point between 3-ways

S_D

Dimmer switch

Adjusts the brightness

S_{OS}

Occupancy sensor

Turns on with movement

S_{WP}

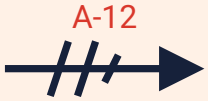
Weatherproof switch

Outdoor or wet location



Switch leg

Dashed line: which switch controls which light



Home run

Arrow to the panel; hash marks = number of wires; A-12 = panel A, circuit 12

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LIGHTING & DEVICE SYMBOLS

Fixtures, fans, detectors and boxes



Ceiling fixture

Light mounted on the ceiling



Recessed light

Can light / downlight



Wall fixture

Sconce or wall light



Ceiling fan

Fan with or without light kit



Smoke detector

Hard-wired, usually interconnected



CO detector

Carbon monoxide alarm



Junction box

Box where wires are spliced



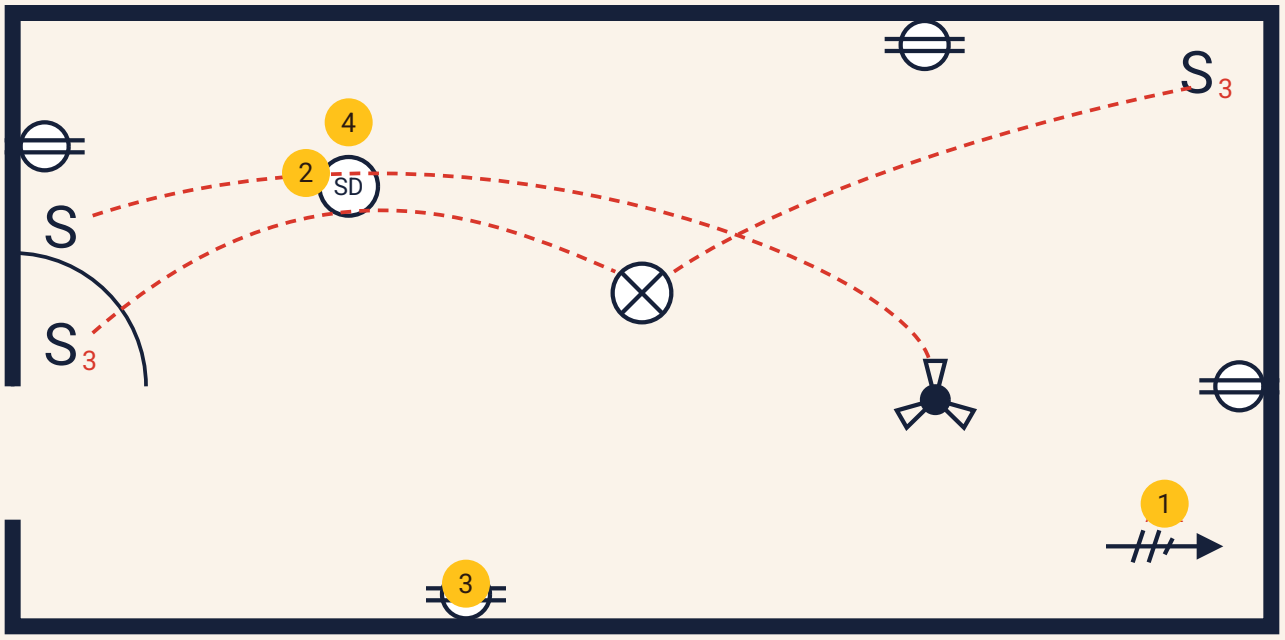
Thermostat

Low-voltage HVAC control

QUICK READING GUIDE

READING A REAL FLOOR PLAN

A bedroom drawn the way you will see it on a blueprint.



1. Find the PANEL and the home run arrow: it tells the circuit (A-12).
2. Follow the dashed switch legs from each S to the lights it controls.
3. Count the receptacles on the walls and look for GFCI/WP notes.
4. Check the legend box of the drawing: drafters change symbols.

Study guide. Symbols vary between drafters: always check the legend on the drawing. Electrical work must follow the NEC and local codes.

QUICK READING GUIDE

HOME RUNS AND WIRE MARKS

The small marks on a line tell you how many wires are inside.



Long mark	Hot conductor (black or red)
Short mark	Neutral (white)
Mark with a dot	Ground (green or bare)
A-12	Panel A, circuit 12
2#12, #12G	Two 12 AWG wires plus one 12 AWG ground
3/4" C	3/4 inch conduit

QUICK READING GUIDE

SCHEMATIC SYMBOLS (NEMA)

The ones you will find in motor controls and equipment diagrams.



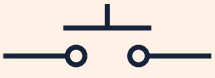
Contact NO

Open until the coil is energized



Contact NC

Closed until the coil is energized



Pushbutton NO

Start



Pushbutton NC

Stop



Coil

Contactor or relay coil



Overload contact

Opens on overload



Timed contact

Closes after a delay



Pilot light

Indicator lamp

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QUICK READING GUIDE

SCHEMATIC SYMBOLS (NEMA)

The ones you will find in motor controls and equipment diagrams.



Fuse

Opens once on overcurrent



Circuit breaker

Trips on overcurrent, can be reset



Transformer

Changes the voltage



Motor

M inside a circle



Ground

Connection to earth



Resistor / heater

Heating element



Limit switch

Moved by the machine



Float switch

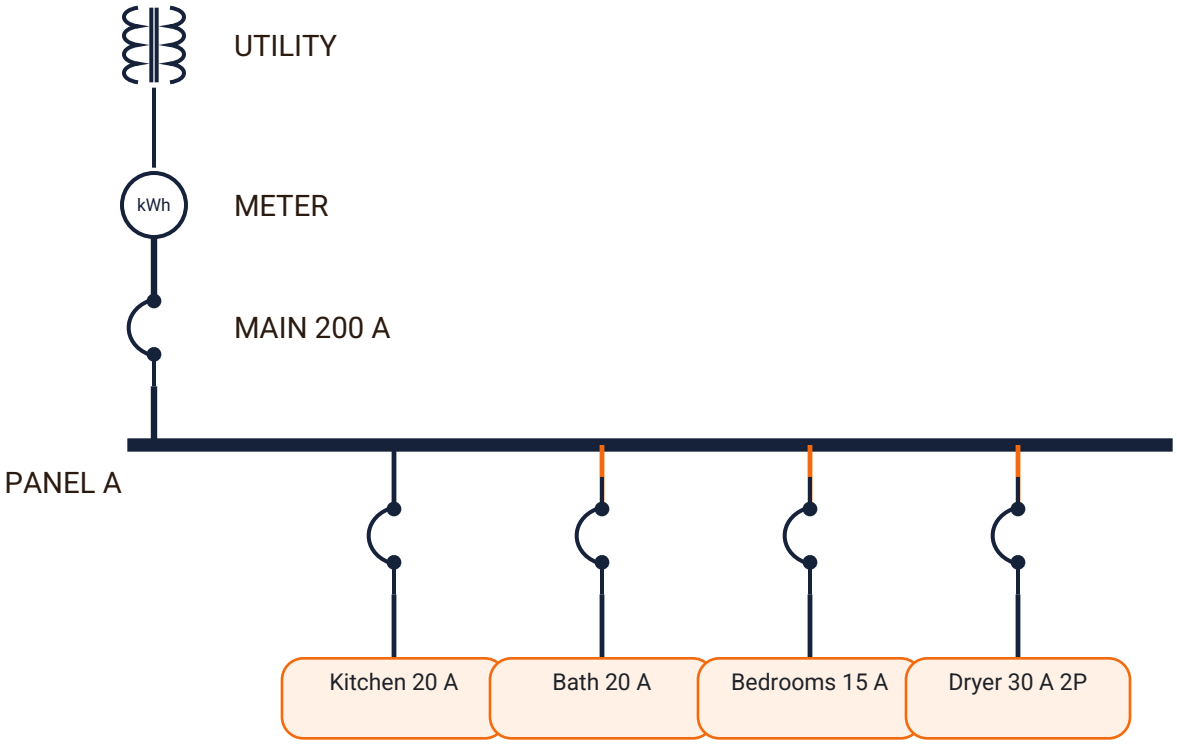
Moved by the liquid level

Study guide. Symbols vary between drafters: always check the legend on the drawing. Electrical work must follow the NEC and local codes.

QUICK READING GUIDE

ONE-LINE DIAGRAM OF A HOUSE

How power gets from the street to each circuit.



1. Power comes from the utility transformer.
2. The meter measures the energy (kWh).
3. The main breaker protects the whole house.
4. Each branch breaker protects one circuit and its wire size.

QUICK READING GUIDE

PANEL SCHEDULE

The table inside the panel door. It matches the numbers on the floor plan.

Ckt	Breaker	Wire	Description
1	20 A	12 AWG	Kitchen countertop GFCI
2	20 A	12 AWG	Kitchen countertop GFCI
3	20 A	12 AWG	Bathroom receptacles
4	15 A AFCI	14 AWG	Bedroom 1 lights & outlets
5	15 A AFCI	14 AWG	Bedroom 2 lights & outlets
6	20 A	12 AWG	Laundry receptacle
7-9	30 A 2P	10 AWG	Dryer 240 V
8-10	30 A 2P	10 AWG	Water heater 240 V
11	15 A	14 AWG	Smoke detectors
12	15 A AFCI	14 AWG	Living room

ABBREVIATIONS ON DRAWINGS

- **GFCI** — Ground-fault circuit interrupter
- **AFCI** — Arc-fault circuit interrupter
- **WP** — Weatherproof
- **TR** — Tamper-resistant
- **EM** — Emergency
- **NL** — Night light / unswitched
- **UNO** — Unless noted otherwise
- **AFF** — Above finished floor (mounting height)
- **C** — Conduit
- **2P** — Two-pole (240 V) breaker
- **NIC** — Not in contract
- **TYP** — Typical (same for all)

Study guide. Symbols vary between drafters: always check the legend on the drawing. Electrical work must follow the NEC and local codes.

QUICK READING GUIDE

PRACTICE: NAME THE SYMBOL

Write the name under each symbol. Answers at the bottom.

A 

B 

C 

D 

E 

F 

G 

H 

Answers:

A) GFCI receptacle B) 3-way switch C) Recessed light D) Smoke detector E) Switched receptacle F) 4-way switch G) Ceiling fan H) 240 V receptacle

NOW YOU CAN READ THE PLAN

- Always start with the legend box of the drawing.
- Follow the home runs back to the panel.
- Match the circuit numbers with the panel schedule.
- Keep this guide on your phone for the job site.

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