

Glossary of Electrical symbols







There are standards that deal with electrical symbols, but in reality, symbols used vary from plan to plan and company to company.




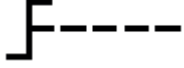
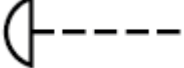
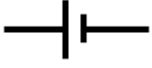

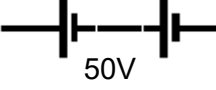


You will need to be able to identify any symbol presented to you.







The key thing with electrical symbols is, to have a legend that identifies what each symbol is on the plan you are looking at.

Here are some examples of drawing symbols you may come across.



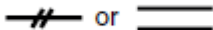






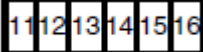
Group 1: General symbols

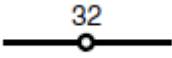
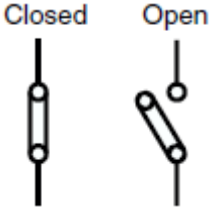
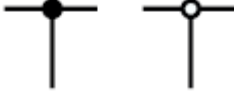

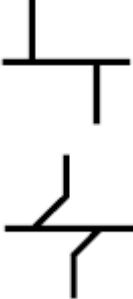


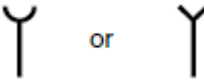
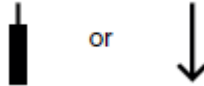
Item definition	Symbol	Comment
Direct current or steady voltage		
Alternating current (General symbol)		Used for all sinusoidal frequencies
Suitable for use on either direct or alternating supply		
Alternating current three-phase with neutral 50 Hz, 400 V	3N ~ 50 Hz 400V	3N ~ 50 Hz 400 V New Zealand supply system
Positive polarity		
Negative polarity		
Three-phase winding, delta		

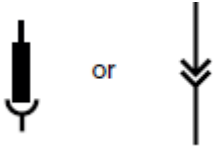
Item definition	Symbol	Comment
Mechanical, pneumatic or hydraulic connection (General symbol)		
Manually operated (General symbol)		
Operated by pushing		Start buttons, bell pushes
Operated by turning		
Emergency switch		Often used in motor control circuits
Primary cell or accumulator. The long line represents the positive pole, the short line, the negative pole.		
Battery showing the cells making up the battery.		
Battery. The nominal voltage should then be indicated.		Example: 50 V battery Can be used to describe any voltage
Earth / Ground (General symbol)		Is earth in New Zealand. Ground in United States.
Frame or chassis connection		

Item definition	Symbol	Comment
Filament lamp		Also known as incandescent lamp
Discharge lamp, gas filled (General symbol)		Neon signs and so on
Hot cathode tubular fluorescent lamp, gas filled		Fluorescent lamps in general
Signal lamp also used generally for light fittings		Used in control and power circuitry. (Note: the same symbol is used for a luminaire (location symbol))
Electric bell (General symbol)		
Electric buzzer (General symbol)		Note inverted symbol

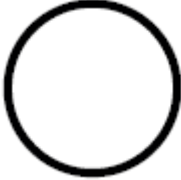
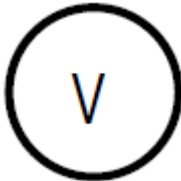


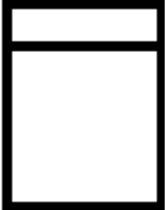
Group 2: Symbols for conductors and connecting devices

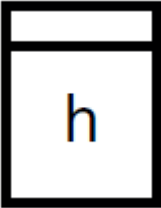
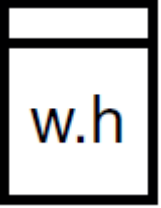




Item definition	Symbol	Comment
Conductor or group of conductors		A line for a particular path may be emphasised by increasing its thickness
Conductor or cable not connected		
Two conductors		
n conductors		For example, 3 phase + N, n = 4.
Twisted conductors (General symbol)		
Two conductors twisted		
Cable (General symbol)		
Two-conductor cable		
Terminal or tag		If necessary to indicate on which terminal a contact is hinged, the solid circle shall represent the bolted or hinged contacts, and the open circle the readily separable contacts
Terminal strip		The numbers shown are an example only

Item definition	Symbol	Comment
Terminals or tags may be numbered as shown		
Link		
Junction of conductors using terminals		
Junction of conductors		
Double junction (either method may be used)		<p>Double junctions of conductors are shown this way to avoid confusion with conductors crossing without electrical connection. The dot represents an electrical connection.</p>
Conductors (crossing without electrical connection)		
Connection common to a group of apparatus		<p>The short stroke indicates that the wire is multiplied over or is common to a number of similar items.</p>
Socket (female) or one pole of a socket		
Plug (male) or one pole of a plug		

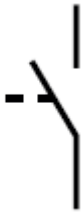



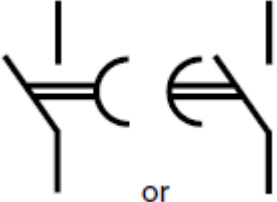

Item definition	Symbol	Comment
Plug and socket (male and female)		


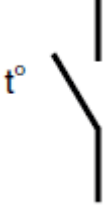




Group 3: Symbols for measuring instruments

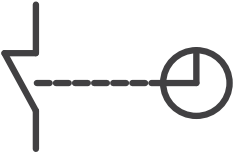
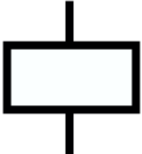



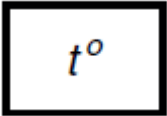
Item definition	Symbol	Comment
Indicating or measuring instrument (General symbol)		This is a general symbol in which the designation of the type of instrument is shown as in the examples below.
Example: Voltmeter		Symbols for other quantities are: <ul style="list-style-type: none"> ▶ A—ammeter ▶ W—wattmeter ▶ var—varmeter (reactive power) ▶ $\cos\phi$—power factor meter ▶ ϕ—phasemeter ▶ Hz—frequency meter ▶ Ω—ohmmeter ▶ \uparrow—galvanometer ▶ n—tachometer
Recording instrument (General symbol)		This is a general symbol in which the designation of the type of instrument is shown, for example, digital readout ammeter
Recording wattmeter		
Integrating meter (General symbol)		This is a general symbol in which the designation of the type of instrument is shown, for example, kWh

Item definition	Symbol	Comment
Hour meter		
Watt-hour meter		
Clock (and slave) (General symbol)		
Master clock		
Time switch		
Synchronous clock		

Group 4: Symbols for switching and protective devices

Item definition	Symbol	Comment
Make contact (will be draw with operating mechanism connected)		
Break contact		
Changeover contact		
Two-way contact with centre-off position		
Make contact delayed when operating		Note the use of the delayed action general symbol (semicircle)
Switch (General symbol)		

Item definition	Symbol	Comment
Limit switch, make contact		
Temperature operated (make contact can be draw as break contact also)		
Fuse (general symbol)		
Fuse switch Single pole		
Manually-operated switch (General symbol)		Some versions may have a circle at the hinge.
Push button switch		

Item definition	Symbol	Comment
Timer operated switch		
Relay, selector or contactor coil (General symbol)		
Contactor		
Overcurrent detection, thermal effect		Frequently used in motor starter circuitry
Overcurrent detection, electromagnetic effect		
Device operated by temperature		





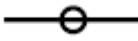





Group 5: Symbols for multipole devices

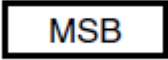


Item definition	Single pole	Double pole	Triple pole
Contactor — n/o contact			
Contactor — n/c contact			
Circuit-breaker			
Isolator			
On-load isolator			








Note: n/o means normally open contacts and n/c means normally closed contacts.

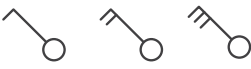










Group 6: Symbols for locations

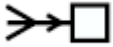







Note: Location symbols are not circuit diagram graphical symbols. These symbols are used on architectural drawings to show the position of electrical services like lights, power outlets, switches, water heaters, cookers, switchboards and cable routes.

Item definition	Symbol	Comment
Wiring line or cable		
Link between associated equipment		
Wiring or cable in conduit, pipe or duct		
Underground line		
Overhead line		
Wiring line or cable joint		
Example: Tee joint		
Junction box involving a cable joint		
Jointing chamber or box, cable pit or manhole		
Switchboard, distribution board, frame, panel or cubicle (General symbol)		Usually drawn into a pattern of blocks or including letters indicating the type of panel.

Item definition	Symbol	Comment
Example: Main switchboard		<p>Other examples of letter symbols for coding of boards:</p> <ul style="list-style-type: none"> ➤ CP = Control panel ➤ CN = Control station ➤ DBL = Distribution board light ➤ DBP = Distribution board power ➤ DSB = Distribution board ➤ IC = Instrument cubicle ➤ MB = Meter board ➤ MCC = Motor control centre ➤ MK = Marshalling kiosk ➤ MSB = Main switchboard ➤ PBS = Push-button station ➤ RCP = Remote control panel ➤ RP = Relay panel ➤ SAS = Security and alarm systems ➤ TB = Terminal box ➤ TP = Terminal panel
Luminaire, or signal lamp (General symbol)		
Luminaire fixed to a wall		
Emergency lighting: Luminaire		

Item definition	Symbol	Comment
Emergency lighting: Floodlight		
Fluorescent luminaire		
Example: Luminaire with three lamps		
Alternative		
Lighting outlet position, for example, batten holder		
Electric appliance (General symbol)		<p>Examples of letter symbols for coding of electrical appliances:</p> <ul style="list-style-type: none"> ➤ AC Air conditioner ➤ BWU Boiling Water Unit ➤ FH Fan Heater ➤ GDU Garbage disposal unit ➤ H Heater ➤ HD Hand dryer ➤ R Range ➤ SDU Sanitary disposal unit
Example: Air conditioner		

Item definition	Symbol	Comment
One-way switches, single-pole and two-pole		
Two-way switch		
Dimmer switch		
Push-button switch		
Socket-outlet (General symbol)		Note: Outlet is on semi-circle side
Socket-outlet with additional identifying information		
Socket-outlet for telecommunication (General symbol)		
Television outlet		
Antenna (aerial) (General symbol)		
Data outlet		
Loudspeaker		

Item definition	Symbol	Comment
Radio receiving set		
Amplifying equipment (General symbol)		
Telephone outlet		
Motor (General symbol)		
Electric bell		
Electric buzzer		
Horn		
Clock		
Generating station, planned	