Motor Symbol Cheat Sheet

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IEC 60617 · IEEE 315 / ANSI Y32.2

1 Eight Motor Symbols



GENERAL MOTOR
Standard circle + M, two leads for an ordinary rotating machine.



DC MOTOR
+ / − polarity marks; optional brush or field-winding marks.



SINGLE-PHASE AC
Marked AC or ~, two terminals; fans, pumps, small mains drives.



THREE-PHASE AC
Three line leads, marked 3~; induction or synchronous motor.



GENERATOR
Same outline as a motor, circled G; leads are electrical outputs.



SERVO MOTOR
Power leads plus encoder/control block; dashed feedback link.



STEPPER MOTOR
Phase windings separate; commonly 4 or 6 wires (A, B).



BLDC MOTOR
Three-phase winding to a drive; Hall / position feedback mark.

Standard motor · Generator · Servo · control-linked · Stepper / BLDC · dedicated form

2 Use Case

Symbol	Name	Use it when
	**General motor** IEC 60617 · IEEE 315	Rotating machine converting electrical energy into mechanical energy.
	**DC motor** Armature + field terminals	DC supply; torque/speed set by excitation (series, shunt, compound).
	**Single-phase AC motor** 2 power terminals	Single-phase mains; fans, pumps and small conveyors.
	**Three-phase AC motor** Three-phase terminals	Three-phase induction/synchronous motor; note phase sequence.
	**Generator** 2 output terminals	Converts mechanical energy to electrical energy for the circuit.
	**Servo motor** Power + control / feedback	Closed-loop position/speed control; control + encoder feedback.
	**Stepper motor** 4 or 6 phase terminals	Open-loop pulse positioning; phases brought out separately.
	**BLDC motor** Three-phase + control terminals	Electronic commutation, brushless; three-phase winding to a driver.

3 Labels and Pins

Label	Decodes to	Where you see it
M1, M2	Motor designator; M = Motor, numbering distinguishes multiple motors.	Schematic designator field
G1, G2	Generator designator; G = Generator.	Schematic designator field
DC	DC supply mark (not a motor type code).	Symbol annotation
AC, ~	Single-phase AC motor.	Symbol annotation
3~	Three-phase AC motor.	Symbol annotation
SM / Servo	Habitual servo marking, not a mandatory standard drawing.	Circle designator or annotation
A, B	Phase winding marks on a stepper motor.	Phase terminal annotation

To read a motor symbol in a fixed order:

1. **Identify the body:** M = motor, G = generator; plain power terminals are an ordinary AC/DC motor.
2. **Find the power terminals:** main lead to the supply is the armature/power terminal; note DC polarity and phase sequence.
3. **Trace the field winding:** series with armature = series; parallel = shunt; both = compound.
4. **Check auxiliary marks:** brush mark = brushed construction; extra feedback leads are an encoder or Hall sensor.
5. **Verify in the datasheet:** AC/DC, phase count, terminals, polarity and phase sequence before layout.

Sources: IEC 60617 (graphical symbols) · IEEE 315 / ANSI Y32.2 sec. 2.1 · motor manufacturer datasheets and nameplate conventions.