Brake Motor Wiring: Rectifier and Brake Coil

Date: 29.10.2026 · Rev. 1

Article address: https://drgmotor.com/en/blog/electric-motors/brake-motor-wiring-rectifier-coil

Technical assumptions

- 400 V 50 Hz three-phase supply; control circuit 230 V AC (example).
- The brake is a spring-applied (fail-safe) electromagnetic brake with a DC coil; the brake unit and rectifier are sourced separately from the motor, and the brake maker's diagram prevails.
- Coil voltage, rectifier type and AC input voltage are read from the brake nameplate; terminal names are representative, the device's own wiring diagram prevails.
- With a drive, soft starter or star-delta starting, the brake rectifier is fed from a separate line, not from the motor terminals.
- Air gap and brake adjustment values belong to the brake maker; values are examples, devices are selected from the motor and brake nameplates.

Safety notice

- This content is for technical information only. Wiring, measurement and commissioning must be carried out by qualified electrical personnel, following lock-out and verification of de-energised state, and in line with the motor and device manufacturer's documentation.

Suitable DRG motors and store

- DRG-90L-4 – 1,5 kW: https://drgmotor.com/en/buy-electric-motors-online/1-5-kw-1500-rpm-three-phase-motor-aluminium-drg-90l-4
- DRG-100L2-4 – 3 kW: https://drgmotor.com/en/buy-electric-motors-online/3-kw-1500-rpm-three-phase-motor-aluminium-drg-100l2-4
- DRG-112M-4 – 4 kW: https://drgmotor.com/en/buy-electric-motors-online/4-kw-1500-rpm-three-phase-motor-aluminium-drg-112m-4
- DRG-132S-4 – 5,5 kW: https://drgmotor.com/en/buy-electric-motors-online/5-5-kw-1500-rpm-three-phase-motor-aluminium-drg-132s-4
- https://drgmotor.com/en/buy-electric-motors-online

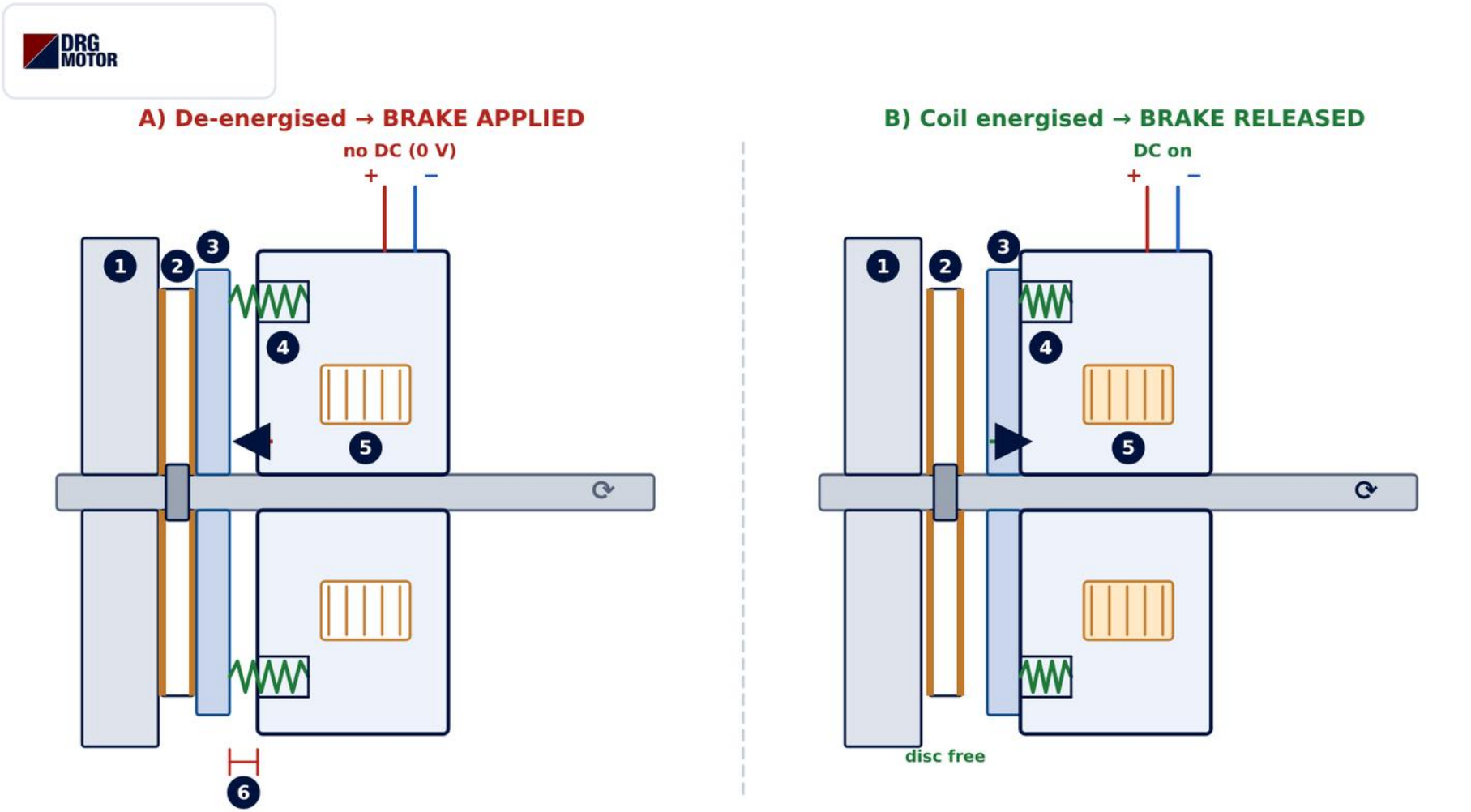
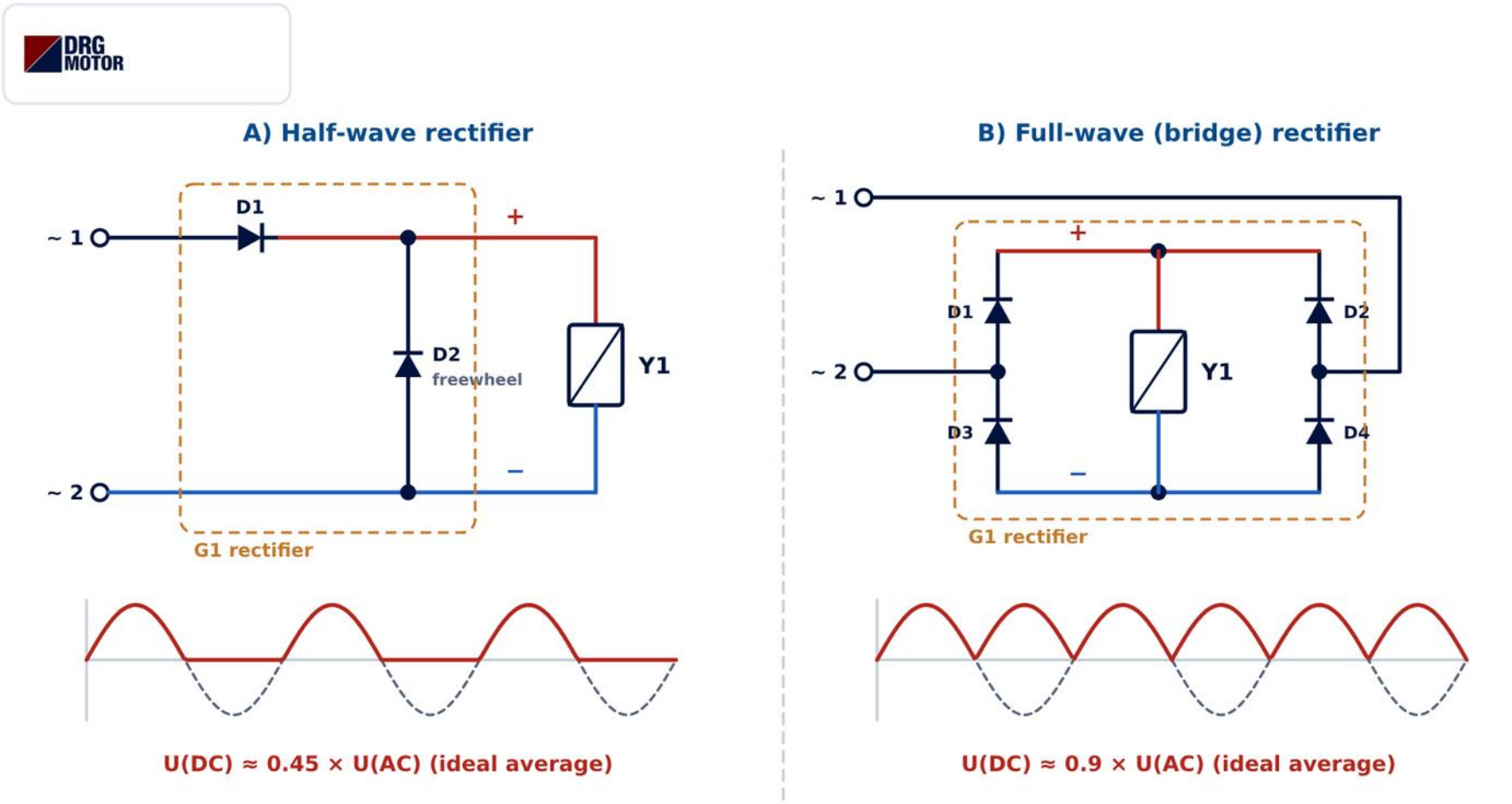

A) De-energised → BRAKE APPLIED
no DC (0 V)
+
−
1
2
3
4
5
6
B) Coil energised → BRAKE RELEASED
DC on
+
−
1
2
3
4
5
disc free
Springs press the armature onto the disc and the disc onto the end shield.
The coil pulls the armature, the air gap closes; disc and shaft turn freely.
1 end shield / friction face (fixed)
2 lined brake disc (turns with shaft)
3 armature plate (slides axially)
4 pressure springs
5 magnet body + DC coil (fixed)
6 air gap (value: brake maker)
Spring-applied electromagnetic brake: brakes when power is lost
Simplified section · actual design varies by brake type

Figure 1

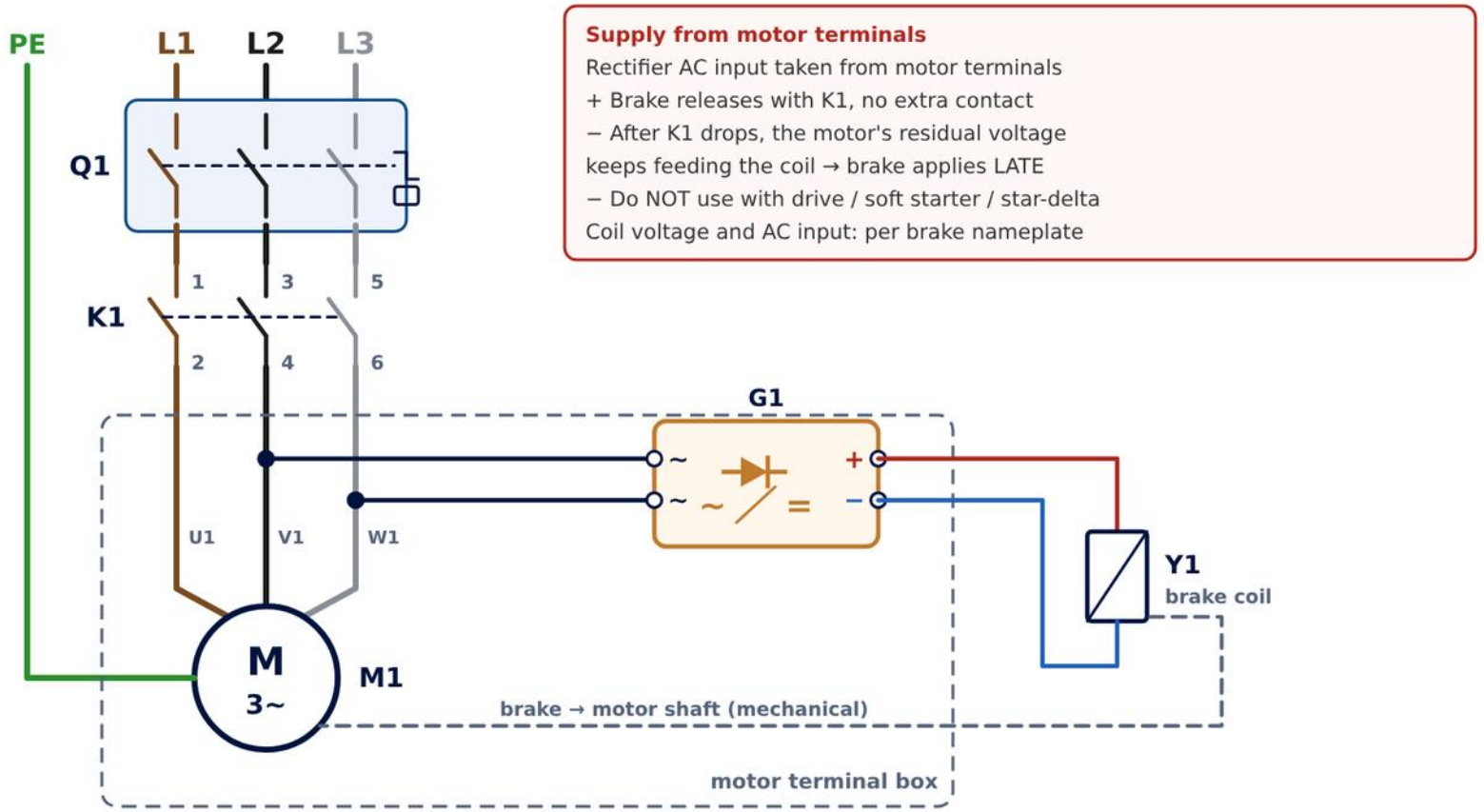


On the same AC supply, half-wave gives roughly half the DC voltage. Read the coil voltage on the brake nameplate; choose the rectifier to suit.
Grey dashed: AC input · red: rectified voltage to the coil · coil inductance smooths the current.

Brake rectifier: half-wave and full-wave

AC supply → G1 rectifier → Y1 DC brake coil · D2 freewheel diode

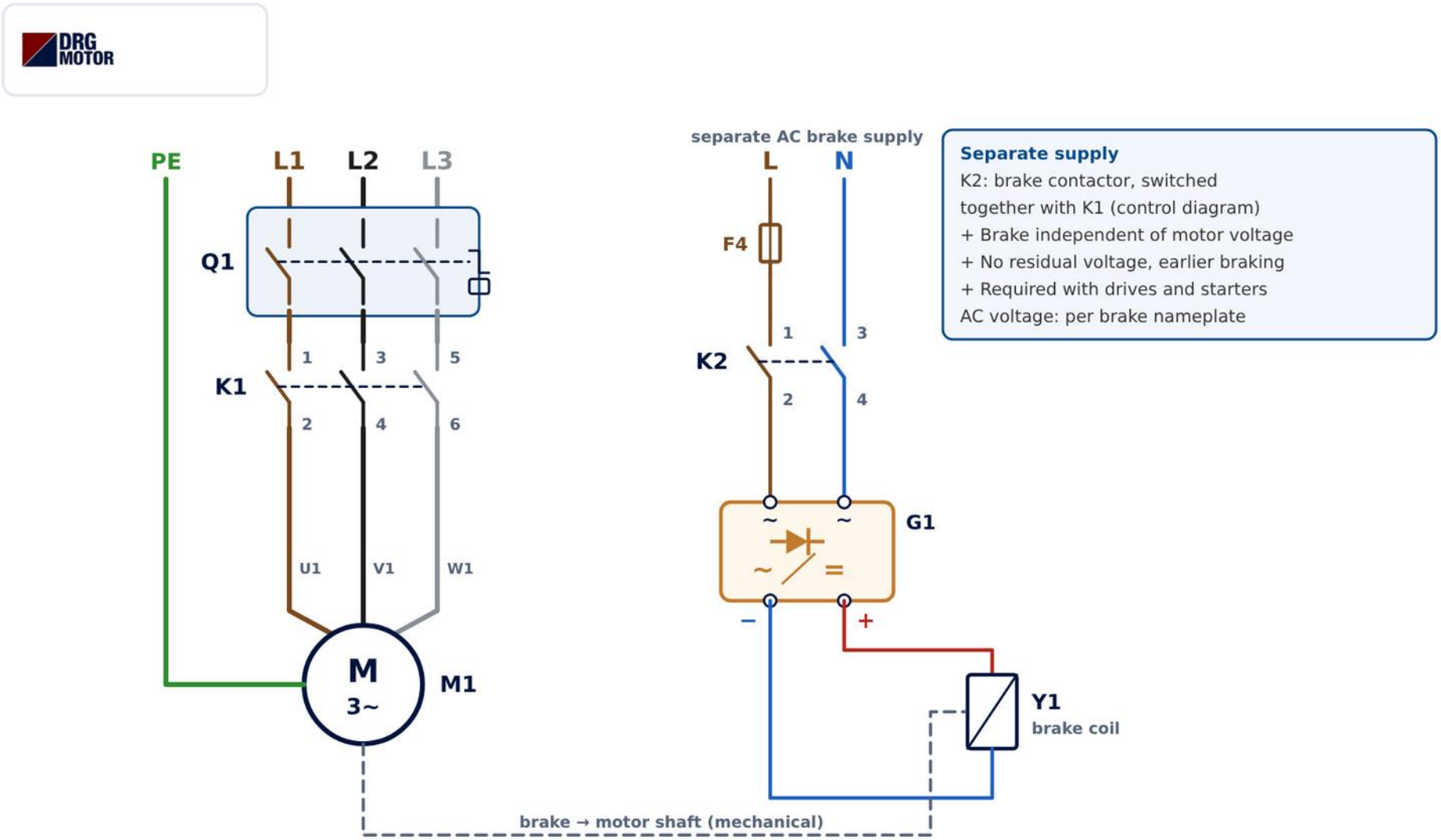
Figure 2



Brake rectifier supplied from the motor terminals

Q1 – K1 – M1 · G1 AC input V1-W1 (example) · Y1 brake coil · no dot = no connection

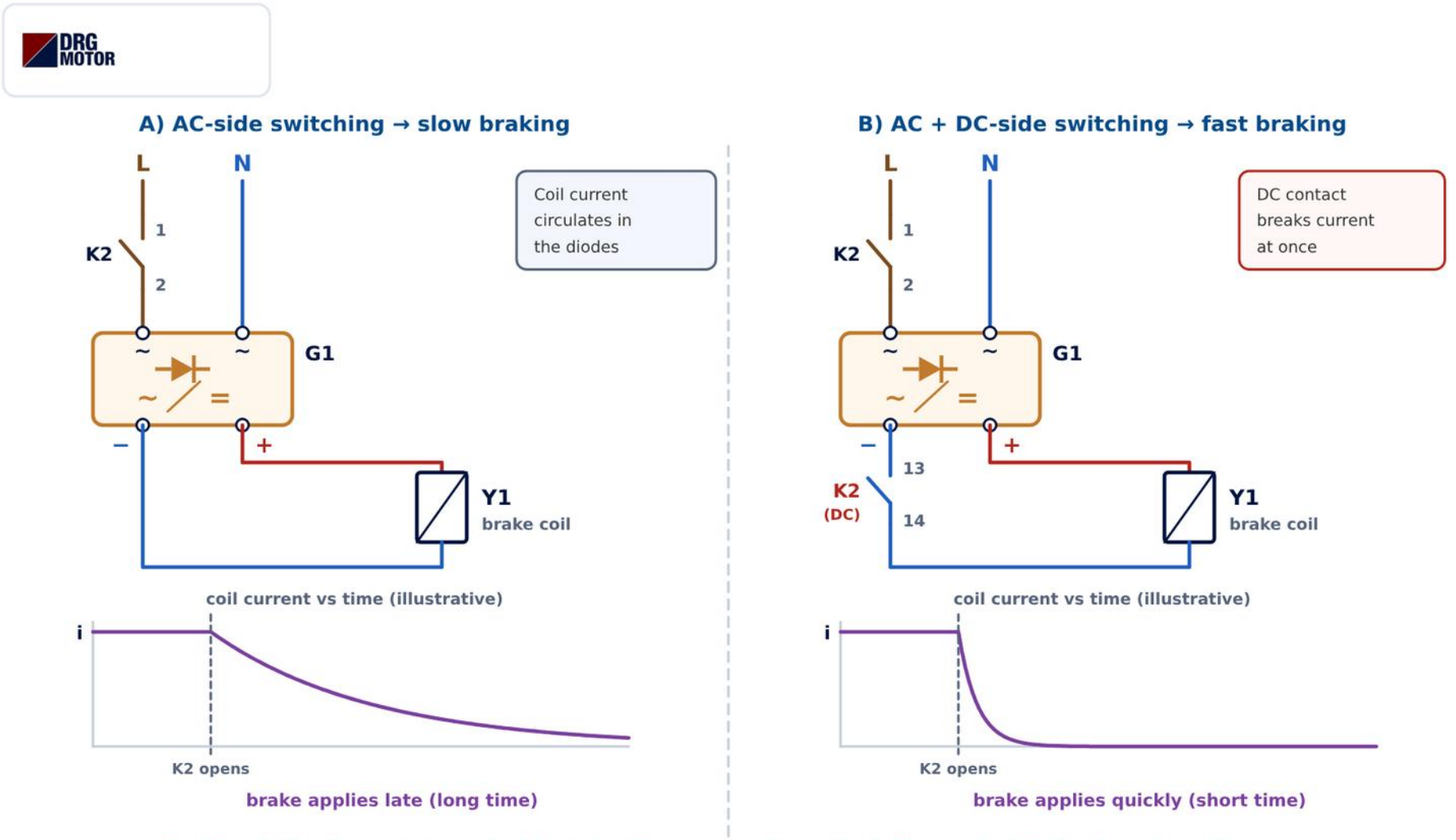
Figure 3



Separately supplied brake rectifier (K2 brake contactor)

Motor: Q1 – K1 – M1 · Brake: F4 – K2 – G1 – Y1 · Terminal names vary by device; the device's own wiring diagram prevails.

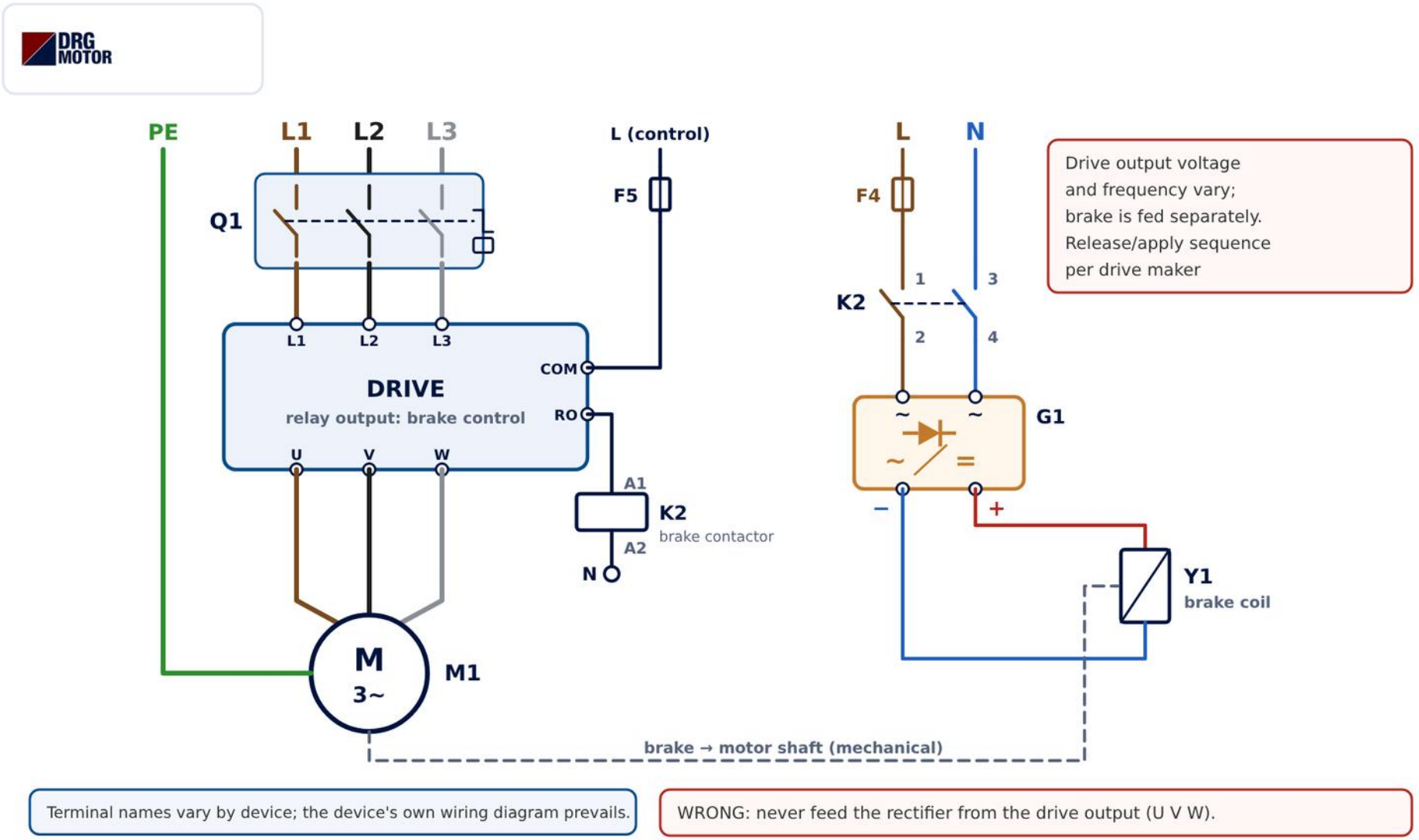
Figure 4



AC-side versus DC-side switching of the brake

K2 1-2 AC contact · K2 13-14 extra contact in series on the DC side · G1 rectifier · Y1 brake coil

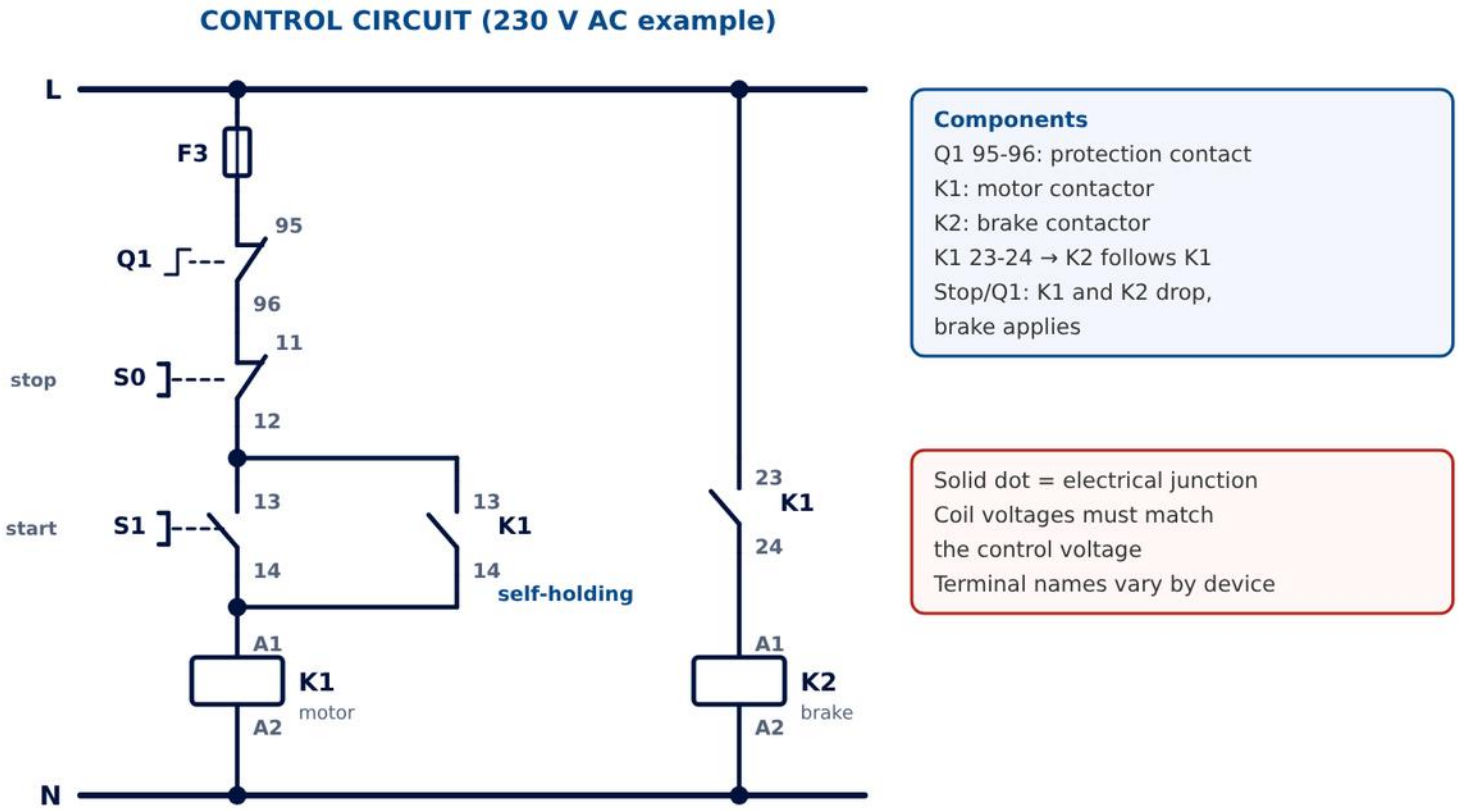
Figure 5



Separate brake supply when the motor runs on a drive

Drive relay output (RO-COM) → K2 brake contactor → G1 → Y1 · motor U V W from the drive only

Figure 6



Brake motor control circuit: K1 motor, K2 brake contactor

L – F3 – Q1 95-96 – S0 – (S1 ‖ K1 13-14) – K1 · K1 23-24 – K2 – N

Figure 7

DRG MOTOR

State	K1	Brake supply	Coil current	Brake	Motor shaft
1 Standby	open	off	none	applied	held
2 Start	closed	on	rises	releases	accelerates
3 Running	closed	on	steady	released	turns
4 Stop – AC switching	open	off	decays slowly	applies late	long stop
5 Stop – DC switching	open	off	cut at once	applies fast	short stop
6 Mains failure	open	off	decays	applied	stops, held
7 Coil/rectifier faulty	closed	on	none	NOT released	drags, overheats

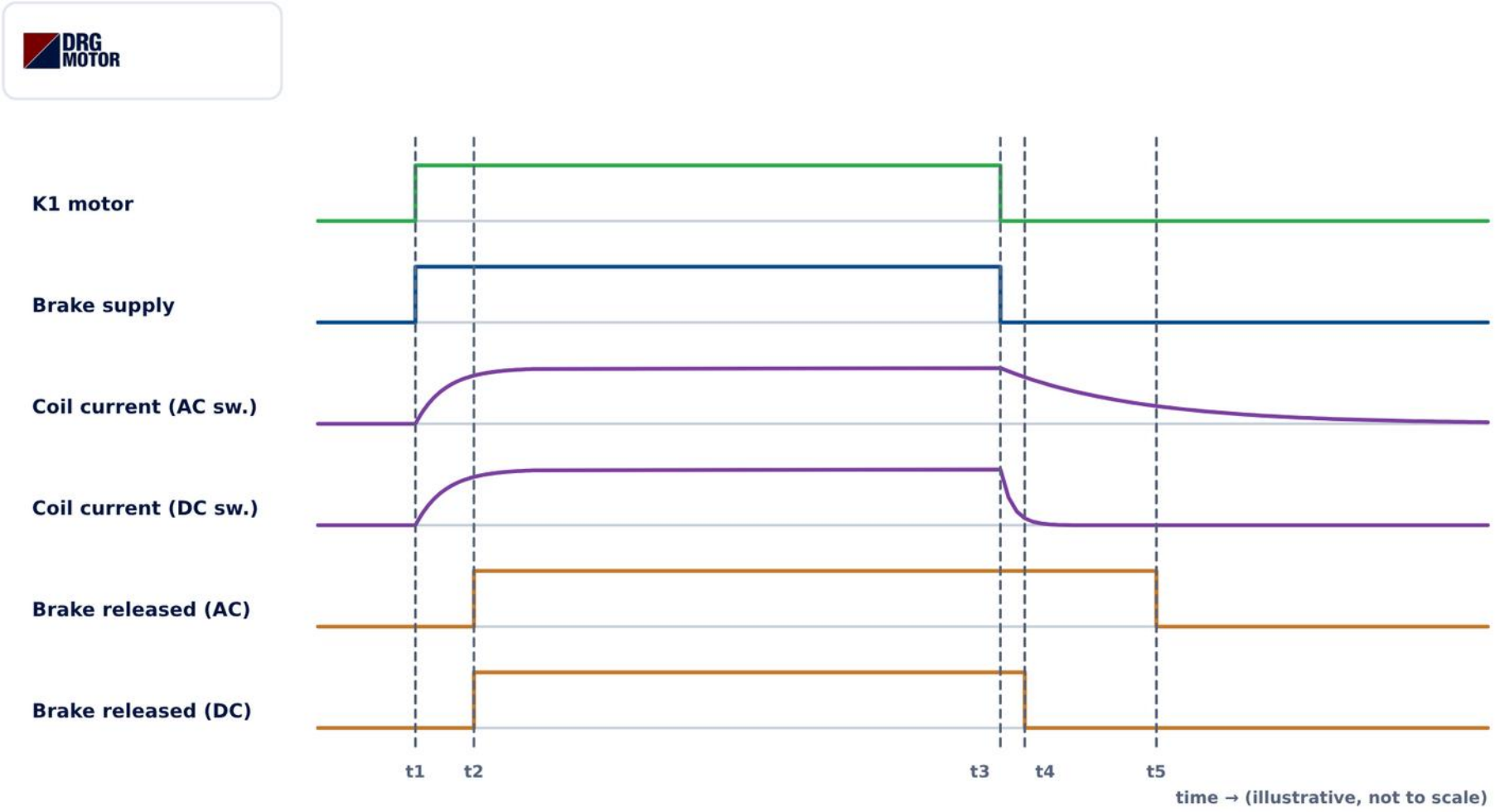
Brake supply comes via K1 (terminal-fed brake) or via K2 (separately supplied brake).

Row 7: the motor drives against the brake and protection trips. Find the cause before restarting.

Brake motor state table

Contactor, brake supply, coil current, brake and shaft in each state

Figure 8



t1 K1 and brake supply on · t2 coil current high enough, brake releases (release delay) · t3 stop: supply off
t4 with DC switching the brake applies at once · t5 with AC switching current decays via the diodes, brake applies later

Brake motor timing diagram: AC and DC switching

K1, brake supply, coil current and brake state over time

Figure 9