Hand-Off-Auto Motor Control Circuit

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Article address: https://drgmotor.com/en/blog/electric-motors/hand-off-auto-motor-control-circuit

Technical assumptions

- 400 V 50 Hz three-phase supply, control 230 V AC (phase–neutral, fused by F3)
- S3: 3-position maintained selector, two NO contact blocks (13-14 HAND, 23-24 AUTO)
- B1: volt-free automatic command contact (float switch / pressure switch / time switch)
- Terminal numbers and names vary by device; the device's own wiring diagram prevails
- Values are examples; protection and contactor are selected from the motor nameplate

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-2 – 2.2 kW: https://drgmotor.com/en/buy-electric-motors-online/2-2-kw-3000-rpm-three-phase-motor-aluminium-drg-90l-2
- DRG-112M-2 – 4 kW: https://drgmotor.com/en/buy-electric-motors-online/4-kw-3000-rpm-three-phase-motor-aluminium-drg-112m-2
- DRG-132S1-2 – 5.5 kW: https://drgmotor.com/en/buy-electric-motors-online/5-5-kw-3000-rpm-three-phase-motor-cast-iron-drg-132s1-2
- https://drgmotor.com/en/buy-electric-motors-online

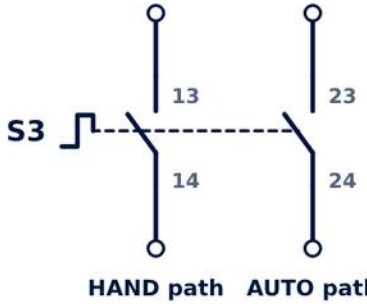
FRONT VIEW



S3 · HAND–OFF–AUTO

3 positions, maintained

SCHEMATIC SYMBOL



Both contacts are normally open (NO); the knob position decides which one closes.

CONTACT TABLE

Contact	HAND	OFF	AUTO
S3 13-14	●	○	○
S3 23-24	○	○	●

● **closed (conducts)** ○ **open**

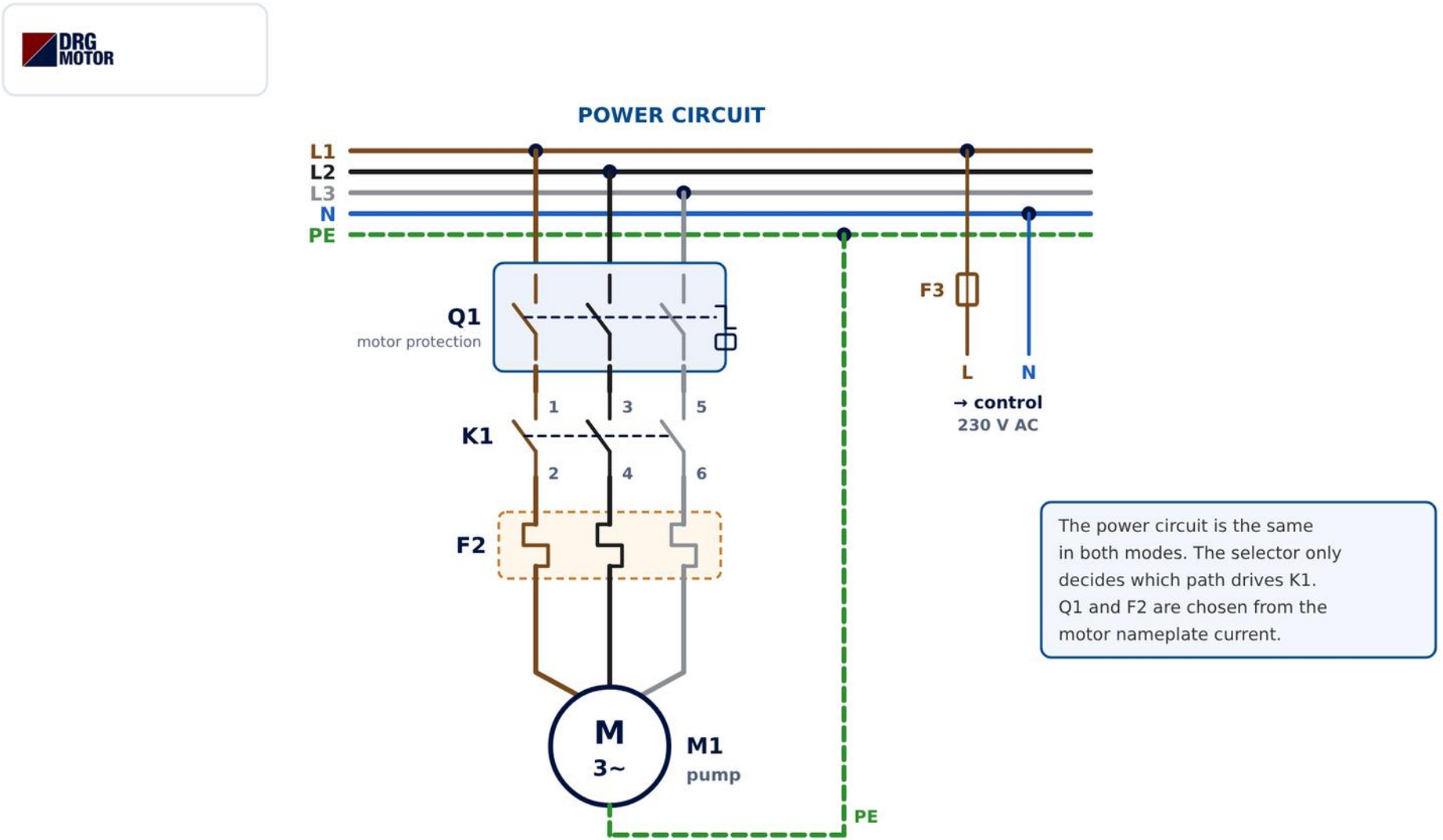
In OFF both contacts are open:
the motor cannot run by hand or auto.
A spring-return selector is not suitable.

Terminal numbers and contact block layout vary by device;
the device's own wiring diagram prevails.

HAND–OFF–AUTO selector: symbol and contact table

S3 13-14 closes only in HAND, S3 23-24 only in AUTO; both are open in OFF.

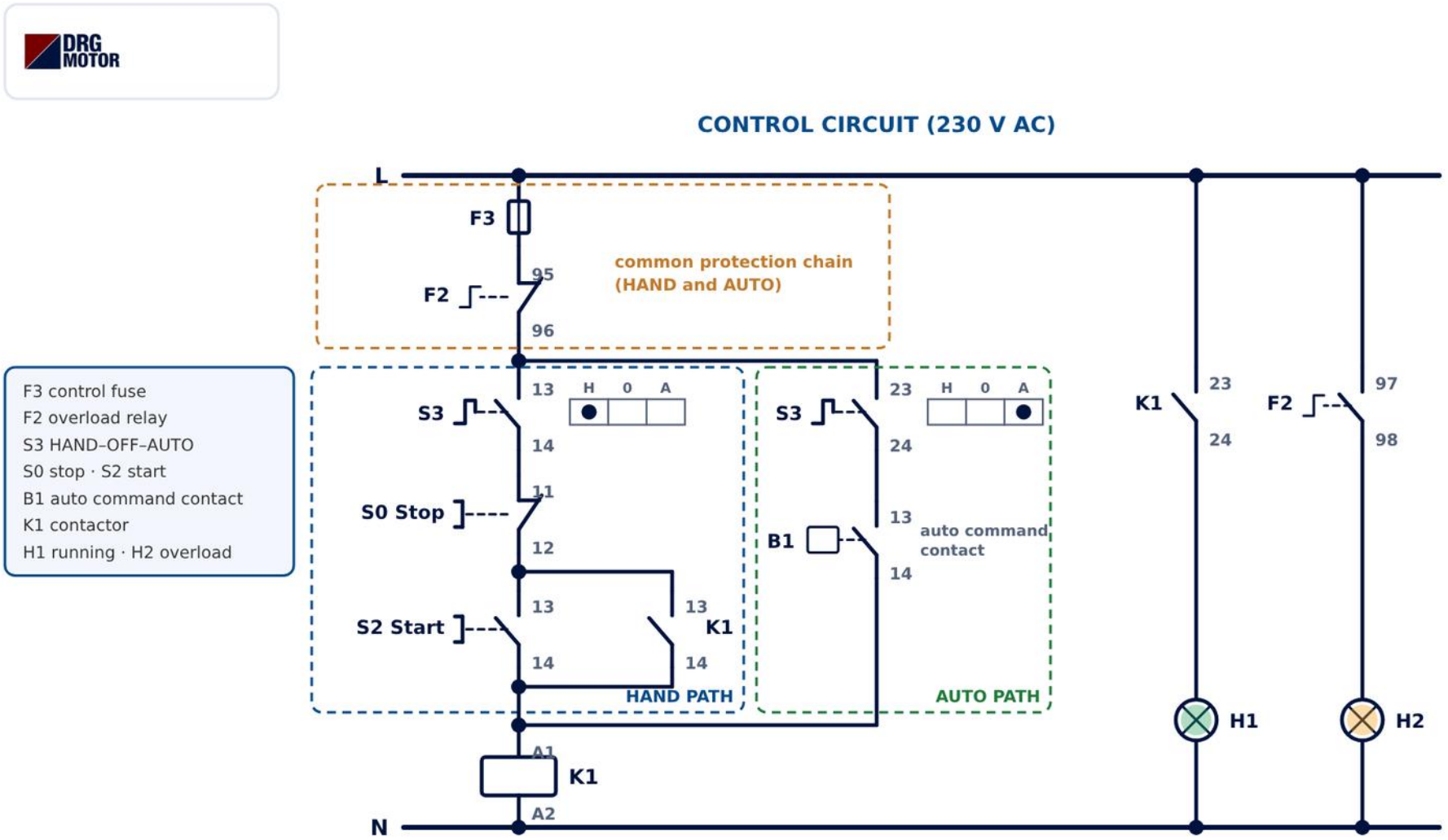
Figure 1



Power circuit of the hand-off-auto starter

Q1 motor protection breaker · K1 contactor · F2 overload relay · M1 pump motor · F3 control fuse

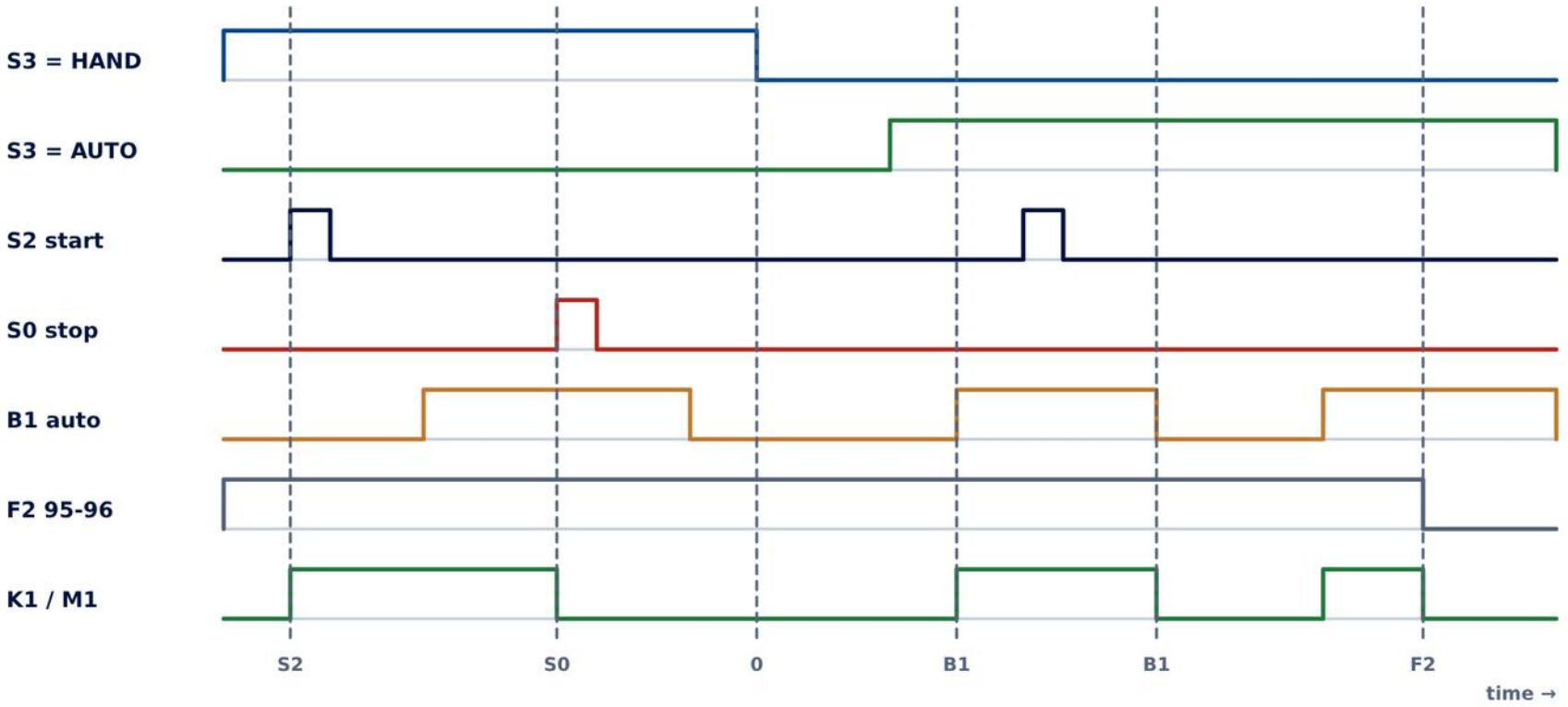
Figure 2



Hand-off-auto control circuit

F3 and F2 95-96 ahead of both paths · self-holding (K1 13-14) in the hand path only · both paths open in OFF

Figure 3



HAND: S2 starts, S0 stops, B1 is ignored · AUTO: K1 follows B1 only, S2 is ignored · F2 trips: motor stops even with B1 closed, H2 lights

Timing diagram: HAND and AUTO operation

High level = contact closed / coil energised. F2 95-96 is normally closed; when it opens, both paths are cut.

Figure 4

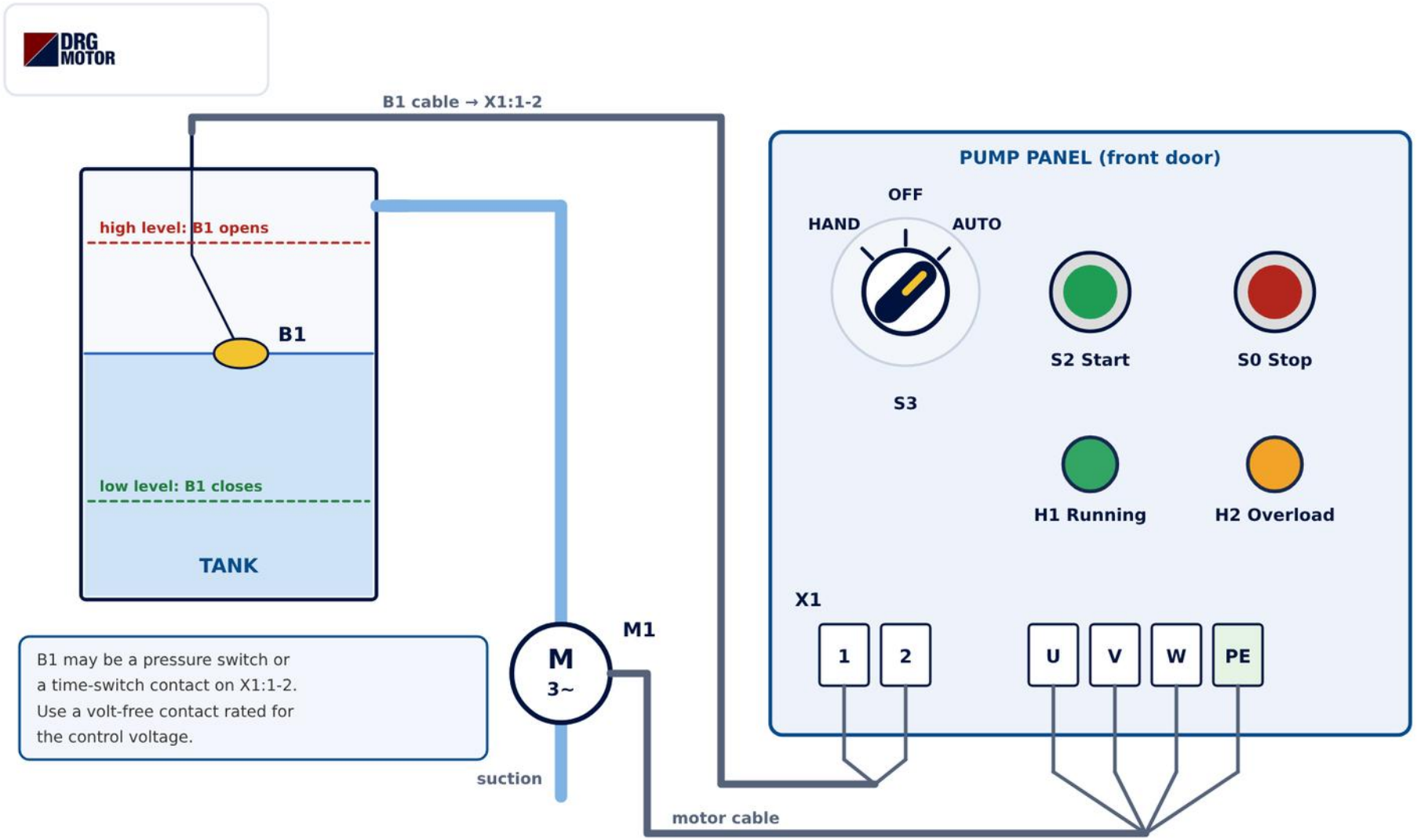
DRG MOTOR

S3 position	Event / condition	K1 · M1	Why
OFF	Any button / B1 closes	STOPS	Both paths open
HAND	S2 pressed	RUNS	K1 13-14 self-holds
HAND	S2 released	RUNS	Self-holding keeps the coil on
HAND	S0 pressed	STOPS	Self-holding is broken
HAND	B1 closes	NO EFFECT	S3 23-24 is open
AUTO	B1 closes	RUNS	As long as B1 stays closed
AUTO	B1 opens	STOPS	No self-holding in auto
AUTO	S2 or S0 pressed	NO EFFECT	S3 13-14 is open
HAND / AUTO	F2 trips (95-96)	STOPS	Common chain opens; H2 lights
HAND → OFF	Selector turned while running	STOPS	13-14 opens, holding drops

State table: what happens in each position?

After F2 is reset, AUTO restarts by itself if B1 is still closed; HAND needs S2 again.

Figure 5



Pump example: tank filling with a float switch

AUTO: B1 closes at low level and the pump runs; it opens at high level. HAND: S2/S0 for service and testing.

Figure 6