Pressure Switch Motor Control Circuit

Date: 29.10.2026 · Rev. 1

Article address: https://drgmotor.com/en/blog/electric-motors/pressure-switch-motor-control-circuit

Technical assumptions

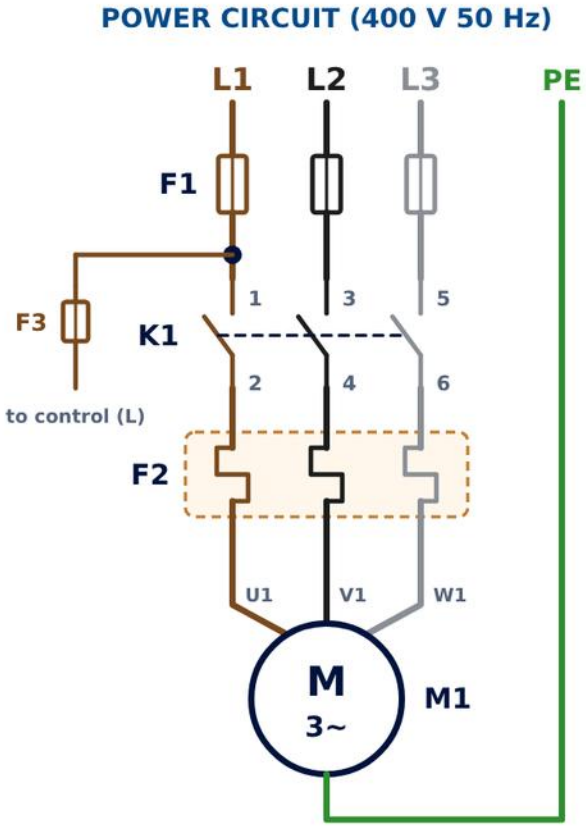
- 400 V 50 Hz three-phase supply, control 230 V AC (L-N).
- The NC contact of pressure switch B1 is in series with the K1 coil; motor phase current does not pass through the switch.
- Cut-in/cut-out values are representative; settings follow system, tank and device data.
- For permitted starts per hour, the motor nameplate / manufacturer data applies.
- Values are examples; select devices from the motor nameplate. Terminal names vary by device; the device wiring diagram prevails.

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-90S-2 (1,5 kW, 3000 rpm): https://drgmotor.com/en/buy-electric-motors-online/1-5-kw-3000-rpm-three-phase-motor-aluminium-drg-90s-2
- DRG-90L-2 (2,2 kW, 3000 rpm): https://drgmotor.com/en/buy-electric-motors-online/2-2-kw-3000-rpm-three-phase-motor-aluminium-drg-90l-2
- DRG-100L2-4 (3 kW, 1500 rpm): https://drgmotor.com/en/buy-electric-motors-online/3-kw-1500-rpm-three-phase-motor-aluminium-drg-100l2-4
- DRG-112M-4 (4 kW, 1500 rpm): https://drgmotor.com/en/buy-electric-motors-online/4-kw-1500-rpm-three-phase-motor-aluminium-drg-112m-4
- https://drgmotor.com/en/buy-electric-motors-online



F1 short circuit · K1 contactor · F2 overload relay
(a motor protection breaker may replace F1+F2)

Where is pressure switch B1?



NC contact
in the K1 coil path

Motor phase current does NOT flow through B1.

B1 only switches the K1 coil;

K1 main contacts 1-2/3-4/5-6 switch the motor.

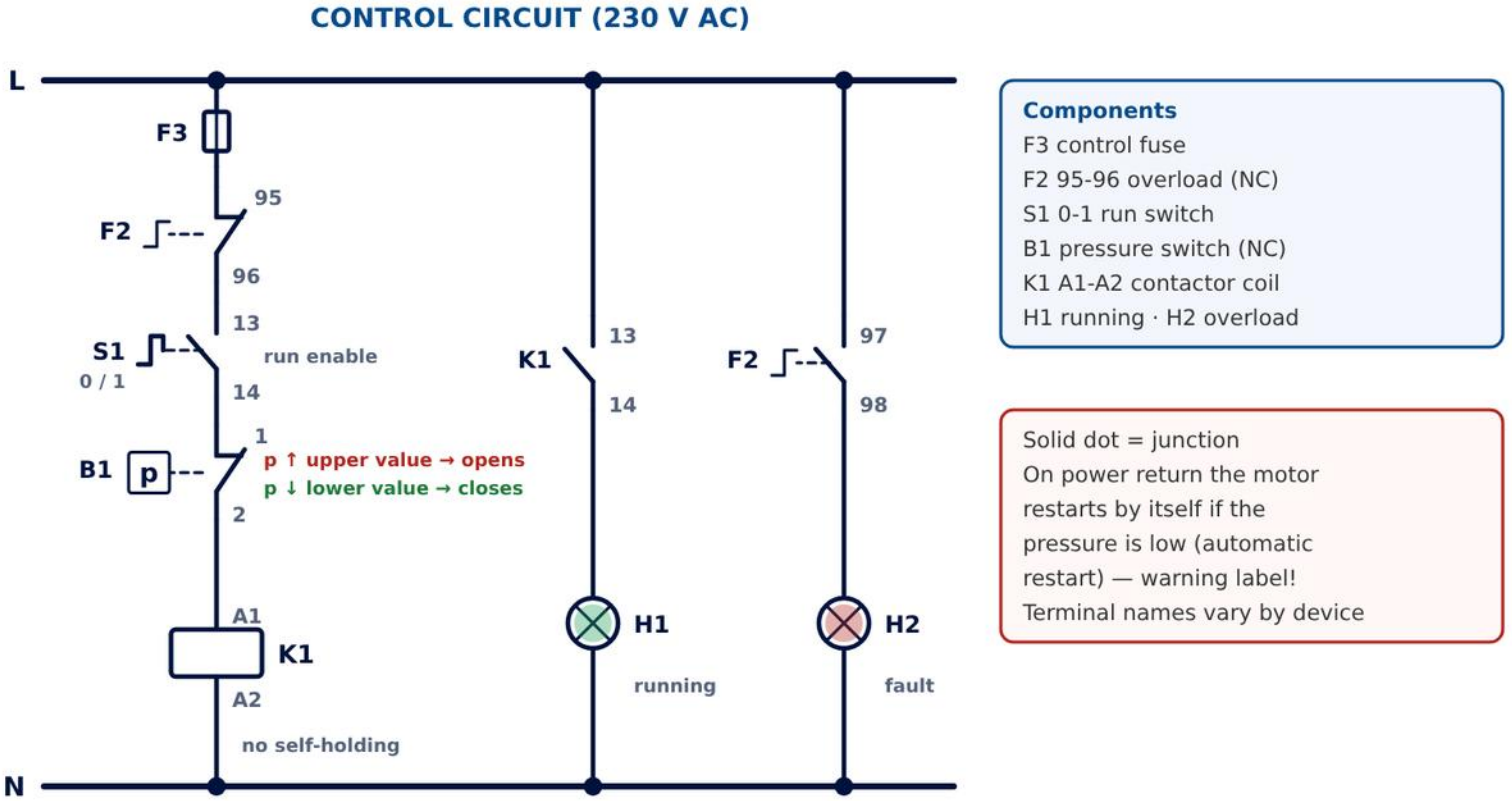
Contact rating: B1 must suit the coil current and control voltage — check the device label.
Terminal names vary by device.

Values are examples; select devices from the motor nameplate.

Pressure-switch motor control: power circuit

L1-L2-L3 – F1 – K1 1-2/3-4/5-6 – F2 – M1 3~ + PE · B1 sits in the control circuit, not here

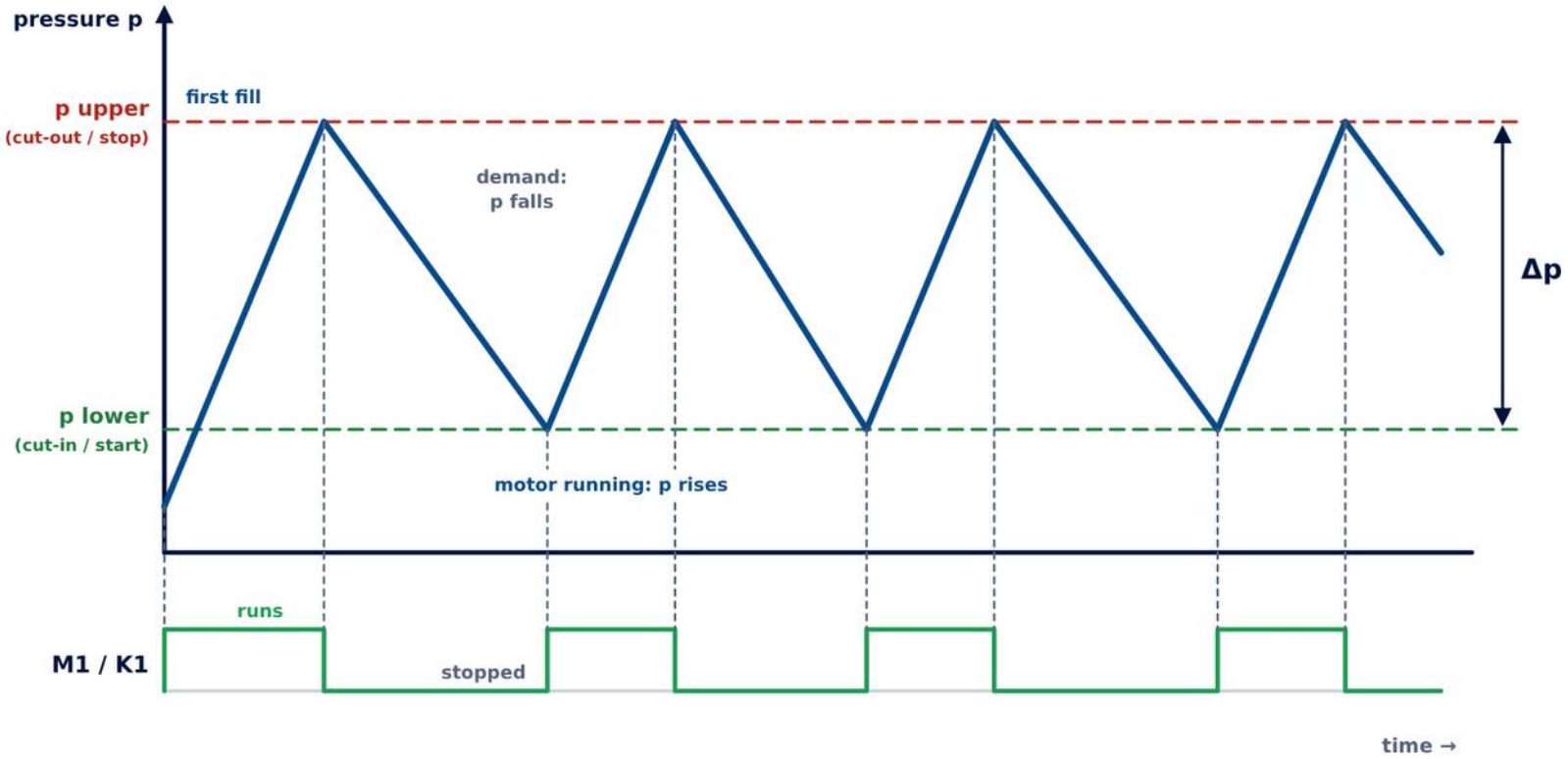
Figure 1



Pressure-switch control circuit

L – F3 – F2 95-96 – S1 – B1 1-2 (NC) – K1 A1-A2 – N · H1: K1 13-14 · H2: F2 97-98

Figure 2

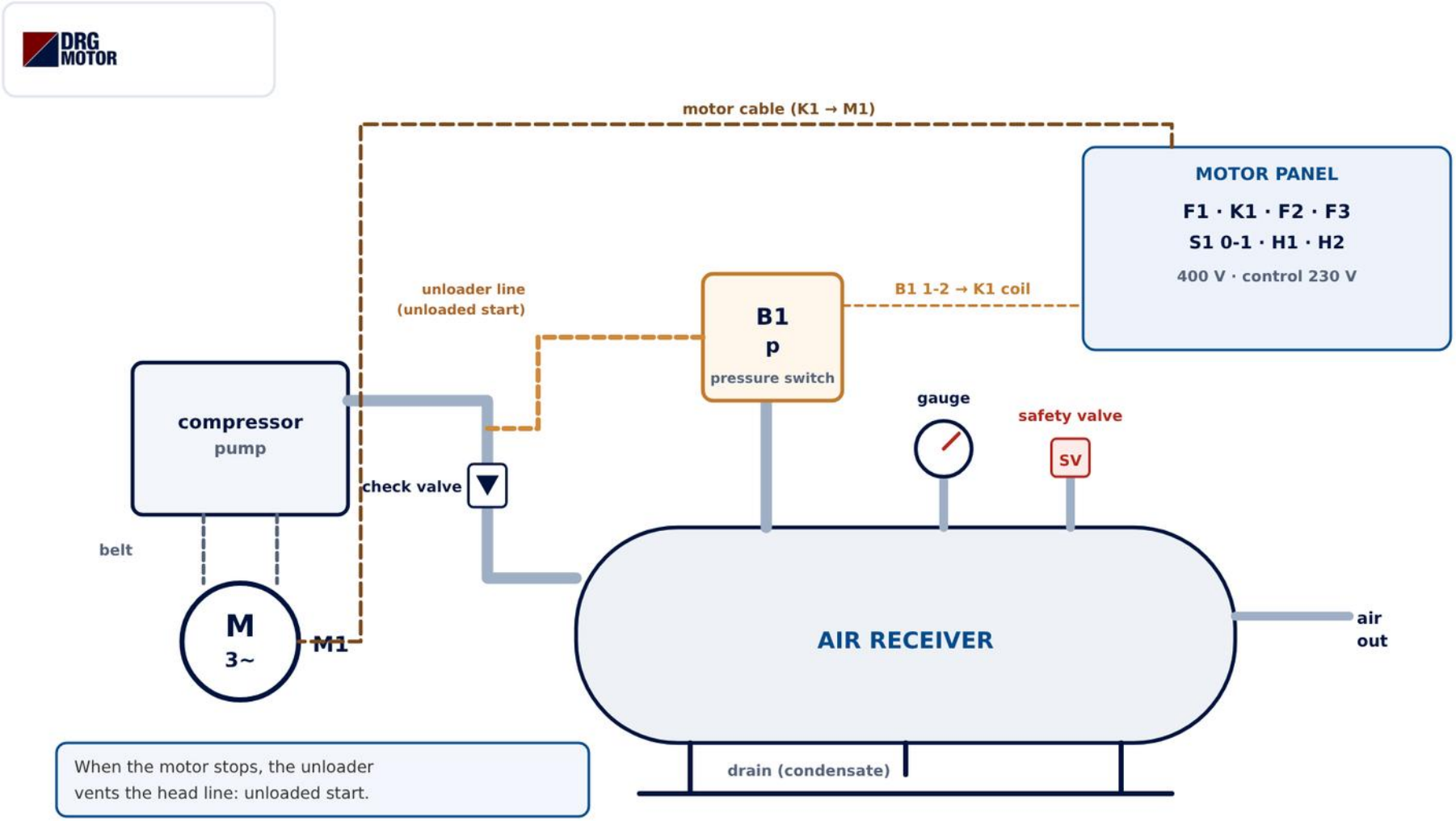


At p lower B1 closes → K1 picks up, motor runs · at p upper B1 opens → K1 drops · between the two, B1 keeps its last state (hysteresis).
Values are representative; set cut-in/cut-out from system, tank and device data.

Cut-in and cut-out pressure: pressure–time curve

Δp = p upper − p lower · narrow Δp means frequent starts, wide Δp means larger pressure swing

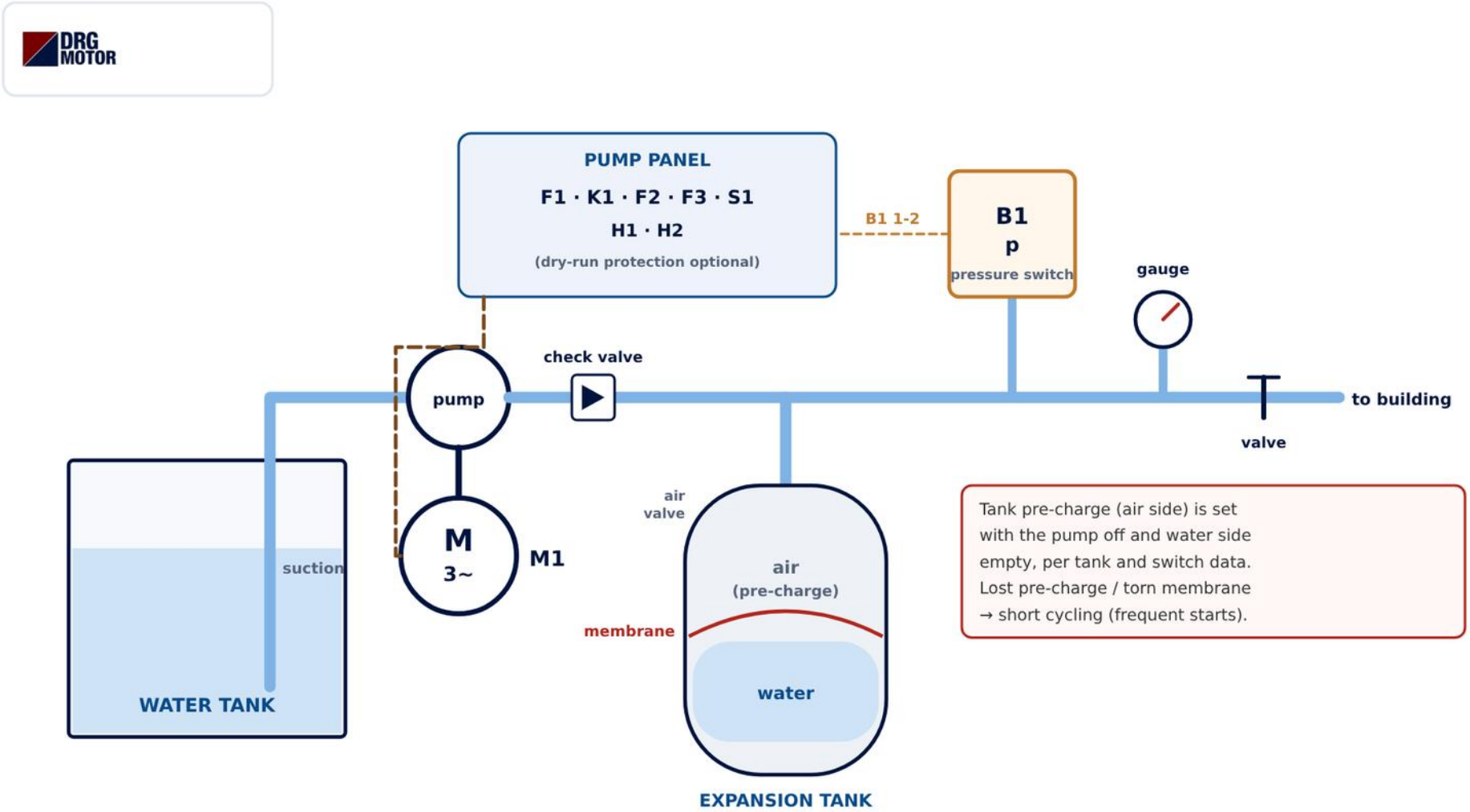
Figure 3



Compressor example: air receiver and pressure switch

B1 senses receiver pressure · check valve stops back-flow · the safety valve is the last safeguard, not a B1 backup

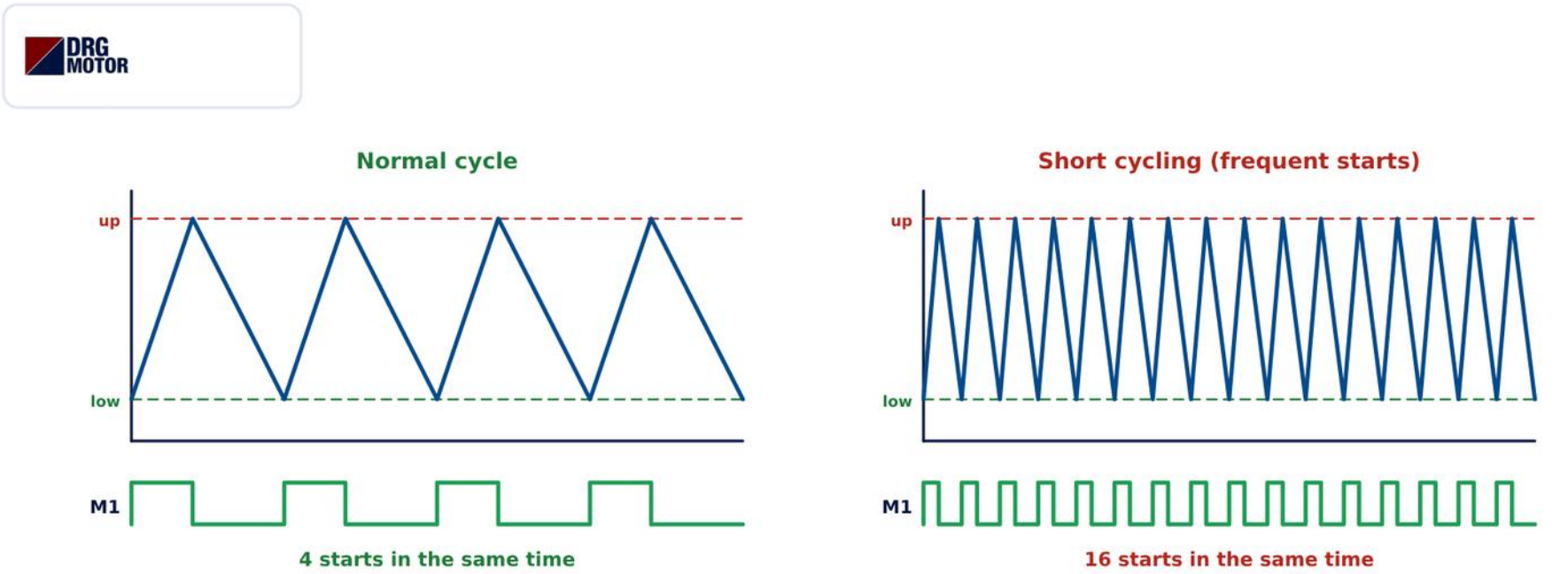
Figure 4



Booster pump example: expansion tank and pressure switch

The tank stores a usable water volume · B1 reads manifold pressure · check valve prevents back-leakage

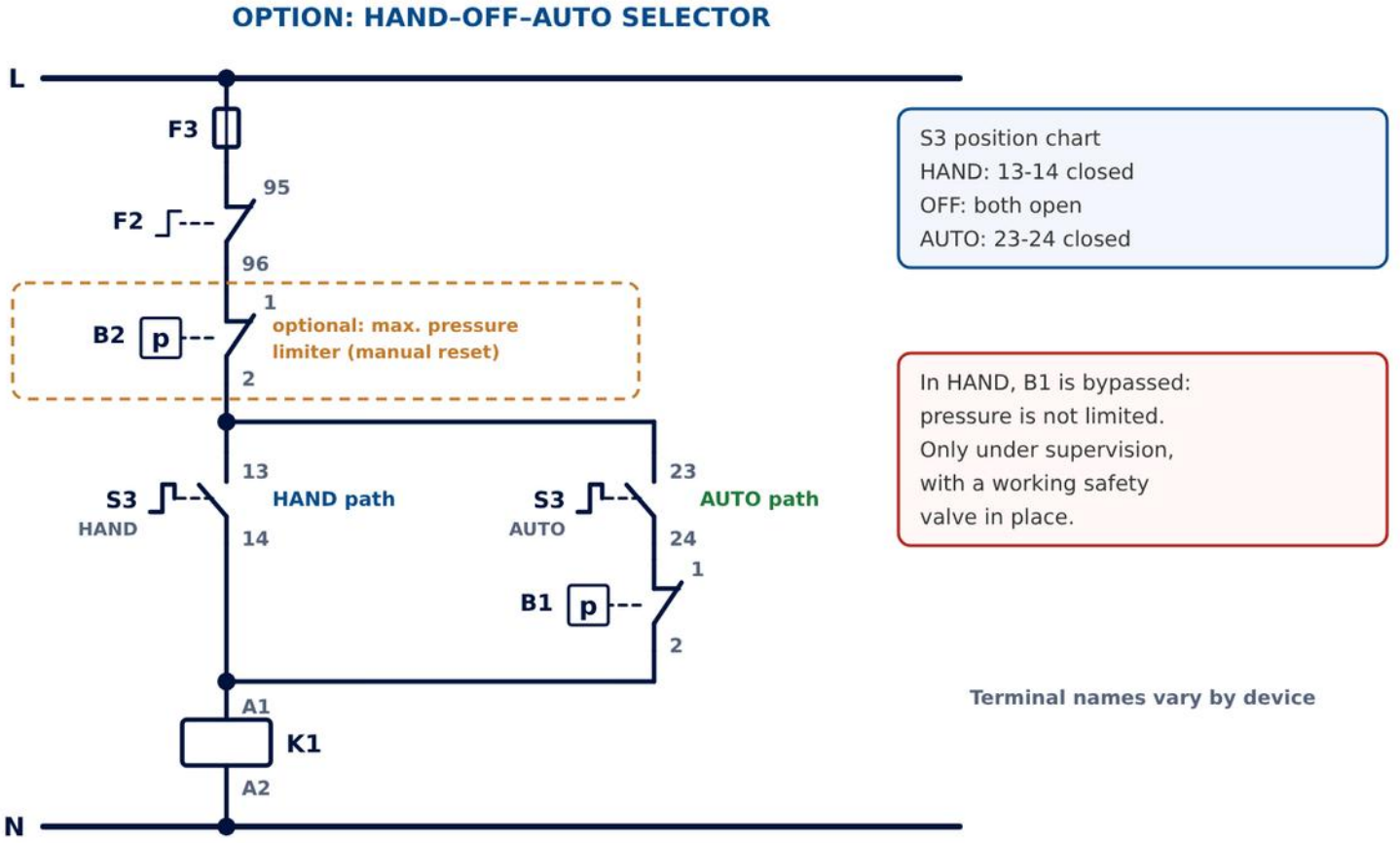
Figure 5



Short cycling: frequent starts in a pressure-switch system

Check leaks and the tank first; adjusting Δp alone does not remove the cause

Figure 6



Pressure-switch circuit: optional HAND–OFF–AUTO selector

Common chain F3 – F2 95-96 – (B2) · HAND: S3 13-14 · AUTO: S3 23-24 + B1 · both paths join at K1

Figure 7

Situation	Pressure	B1 1-2	F2 95-96	K1 / M1
1 First power-up, system empty	< p lower	closed	closed	RUNS
2 Filling (pressure rising)	between	closed	closed	RUNS
3 Upper pressure reached	≥ p upper	open	closed	STOPPED
4 Demand (pressure falling)	between	open	closed	STOPPED
5 Lower pressure reached	< p lower	closed	closed	RUNS
6 Overload trips while running	between	closed	open	STOPPED
7 S1 = 0 (no run enable)	< p lower	closed	closed	STOPPED
8 Power back, pressure low	< p lower	closed	closed	RUNS

Row 4: B1 stays open while pressure falls; the motor restarts only at p lower (differential / hysteresis).

Row 8: with no self-holding the motor restarts by itself — put a warning on the panel door.

Pressure-switch circuit: state table

Pressure, B1 1-2, F2 95-96, K1 and motor in each situation

Figure 8