Two-Location Start-Stop Motor Control

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Article address: https://drgmotor.com/en/blog/electric-motors/two-location-start-stop-motor-control

Technical assumptions

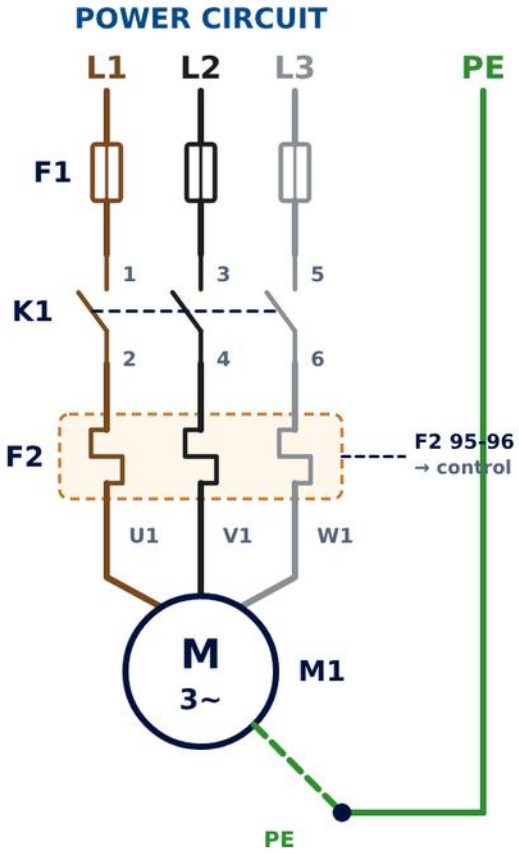
- 400 V 50 Hz three-phase supply; 230 V AC control (L1-N), protected by F3.
- Stop buttons NC (11-12), start buttons NO (13-14); K1 self-holding 13-14, lamp contact 43-44.
- Terminal numbers (X1:1-2-3) and device tags are examples; terminal names vary by device and the device's own wiring diagram prevails.
- Values are examples; fuses, contactor, overload relay and cable are selected from the motor nameplate and site conditions.
- Emergency stop is not shown; the safety function is designed separately on the basis of a risk assessment.

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 1500 rpm three-phase motor: 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 1500 rpm three-phase motor: 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 three-phase motor: https://drgmotor.com/en/buy-electric-motors-online/4-kw-1500-rpm-three-phase-motor-aluminium-drg-112m-4
- DRG-132M-4 – 7.5 kW 1500 rpm three-phase motor: https://drgmotor.com/en/buy-electric-motors-online/7-5-kw-1500-rpm-three-phase-motor-aluminium-drg-132m-4
- https://drgmotor.com/en/buy-electric-motors-online



Components
F1 short-circuit protection (fuses)
K1 contactor, main poles 1-2/3-4/5-6
F2 overload relay
M1 three-phase induction motor + PE

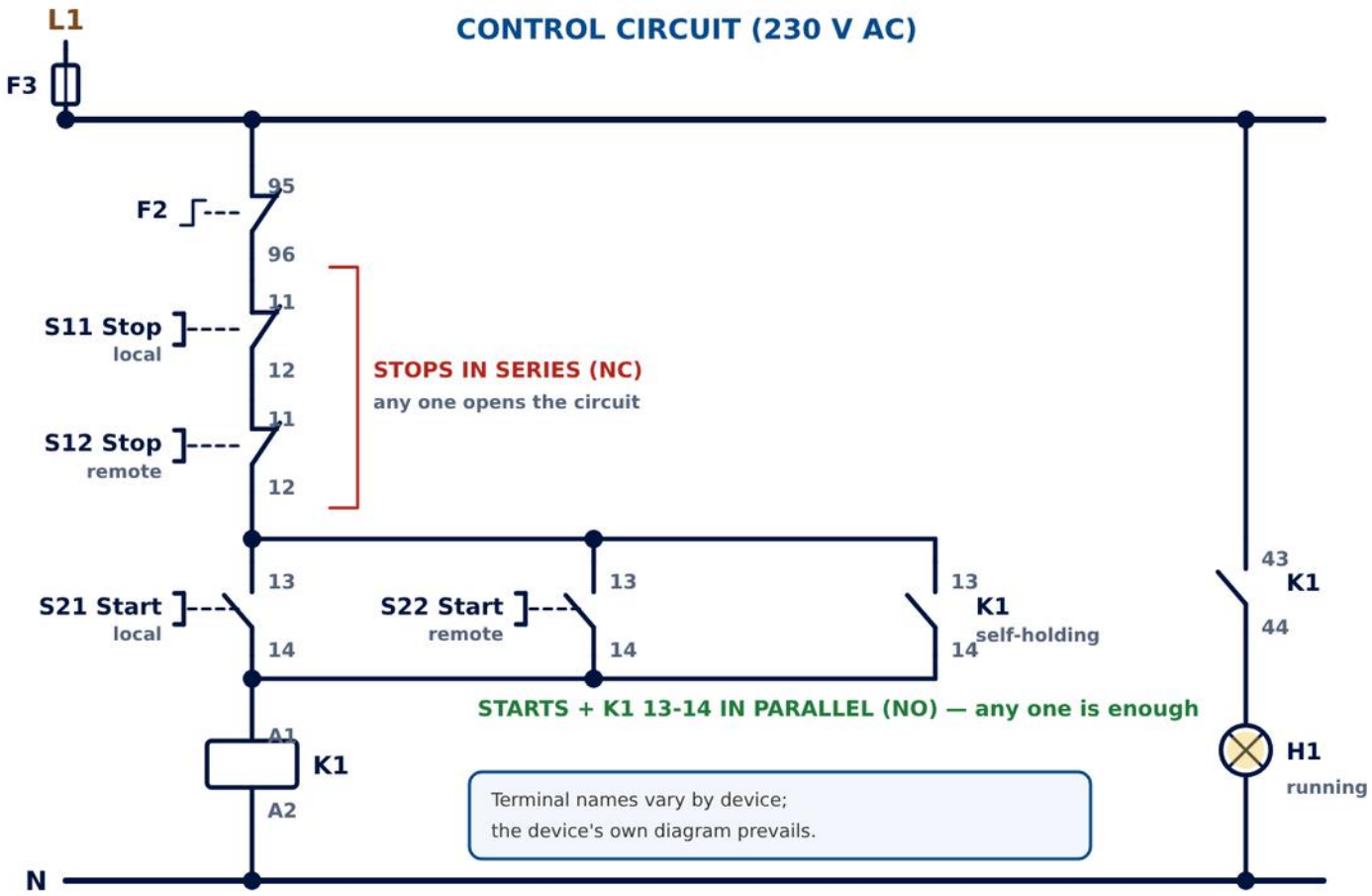
The power circuit is the same as for single-location control. The second station only changes the control circuit (Fig. 2).

Set F2 according to the motor nameplate current. Cable and device sizes depend on the motor.

Two-location control — power circuit

400 V 3~ 50 Hz · F1 fuses · K1 contactor · F2 overload relay · M1 motor

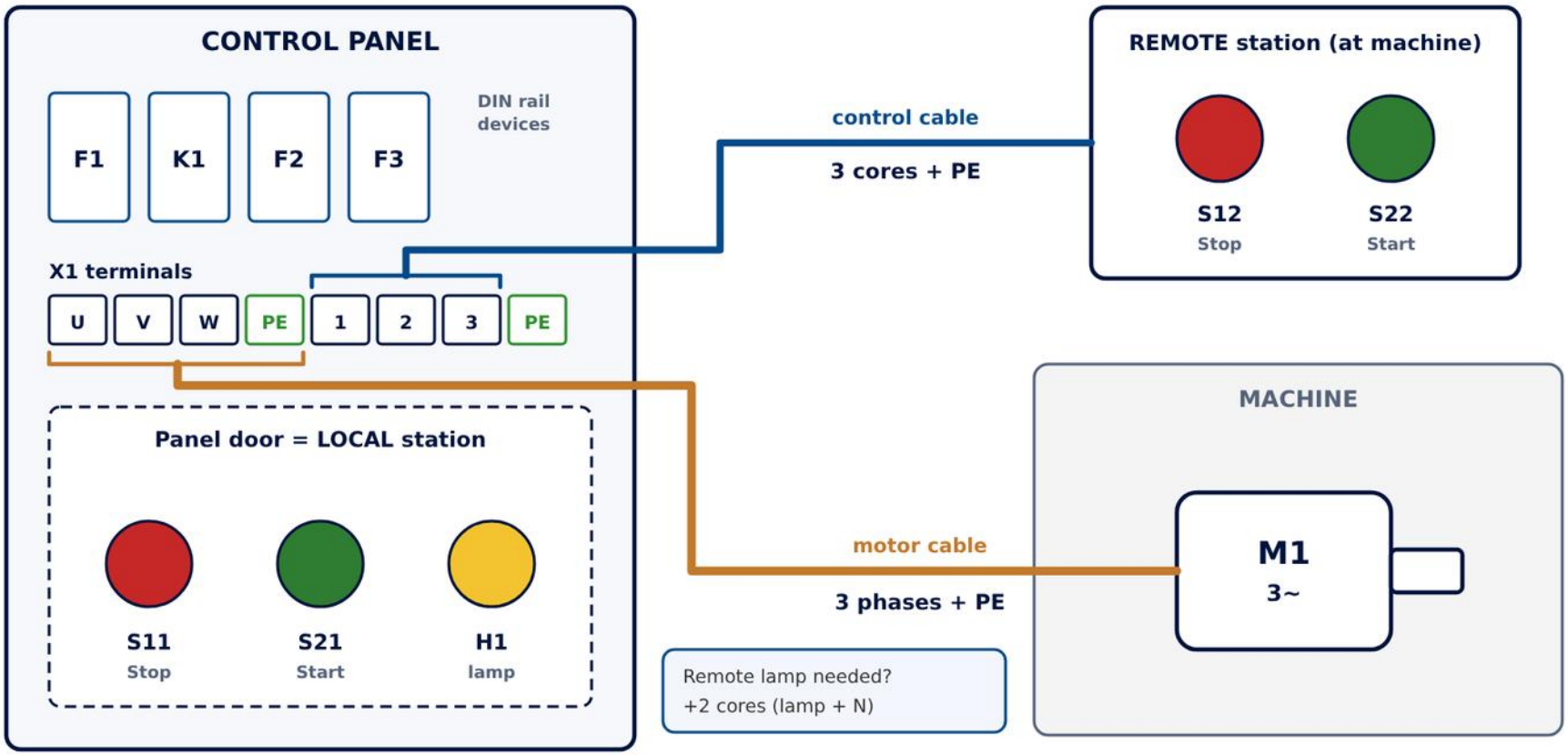
Figure 1



Two-location start-stop — control circuit

S11/S21 on panel door (local) · S12/S22 at the machine (remote) · K1 13-14 self-holding · H1 run lamp

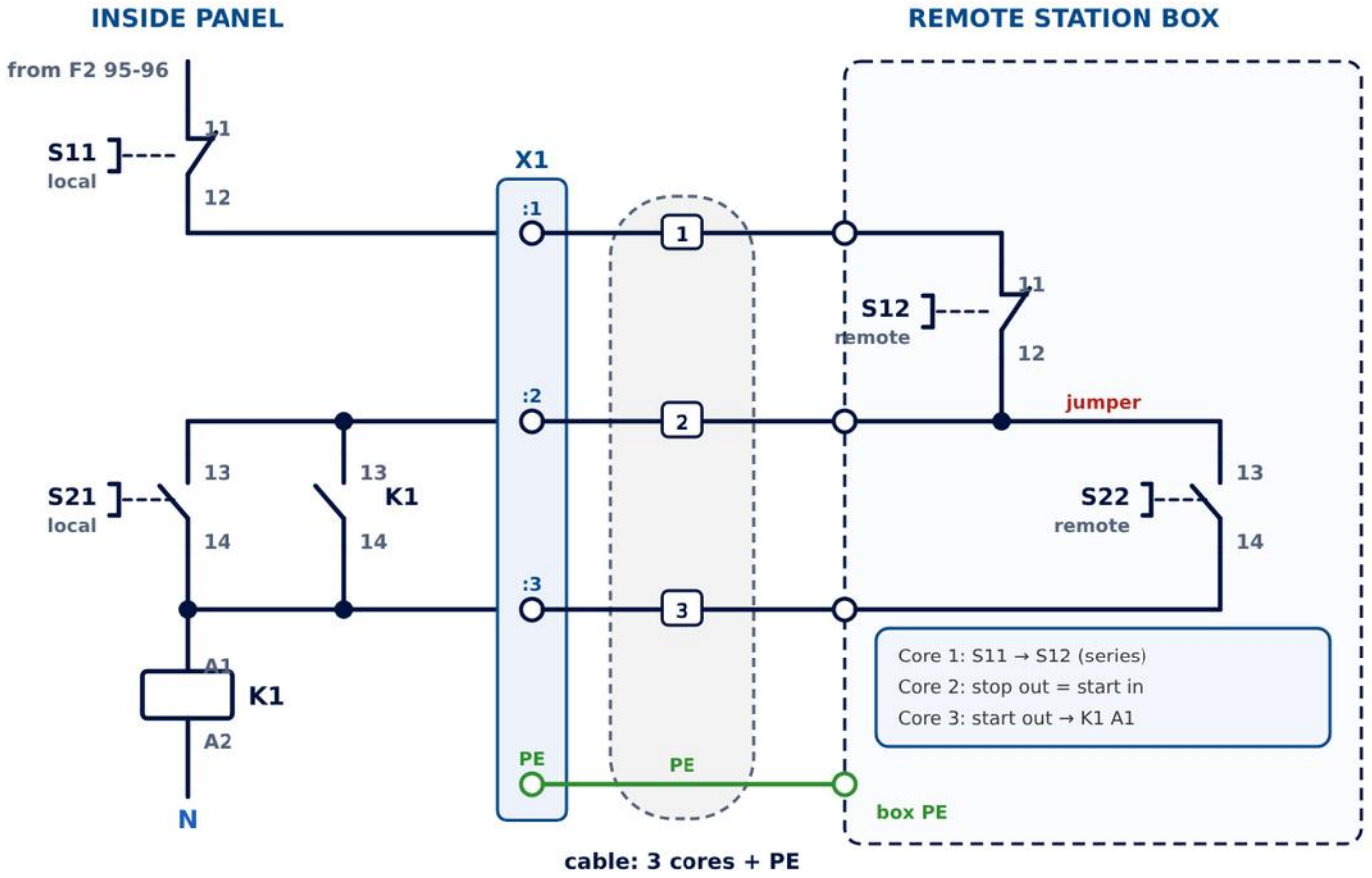
Figure 2



Station layout and number of cable cores

Local: S11/S21 on panel door · Remote: S12/S22 at machine · control cable X1:1-2-3 + PE

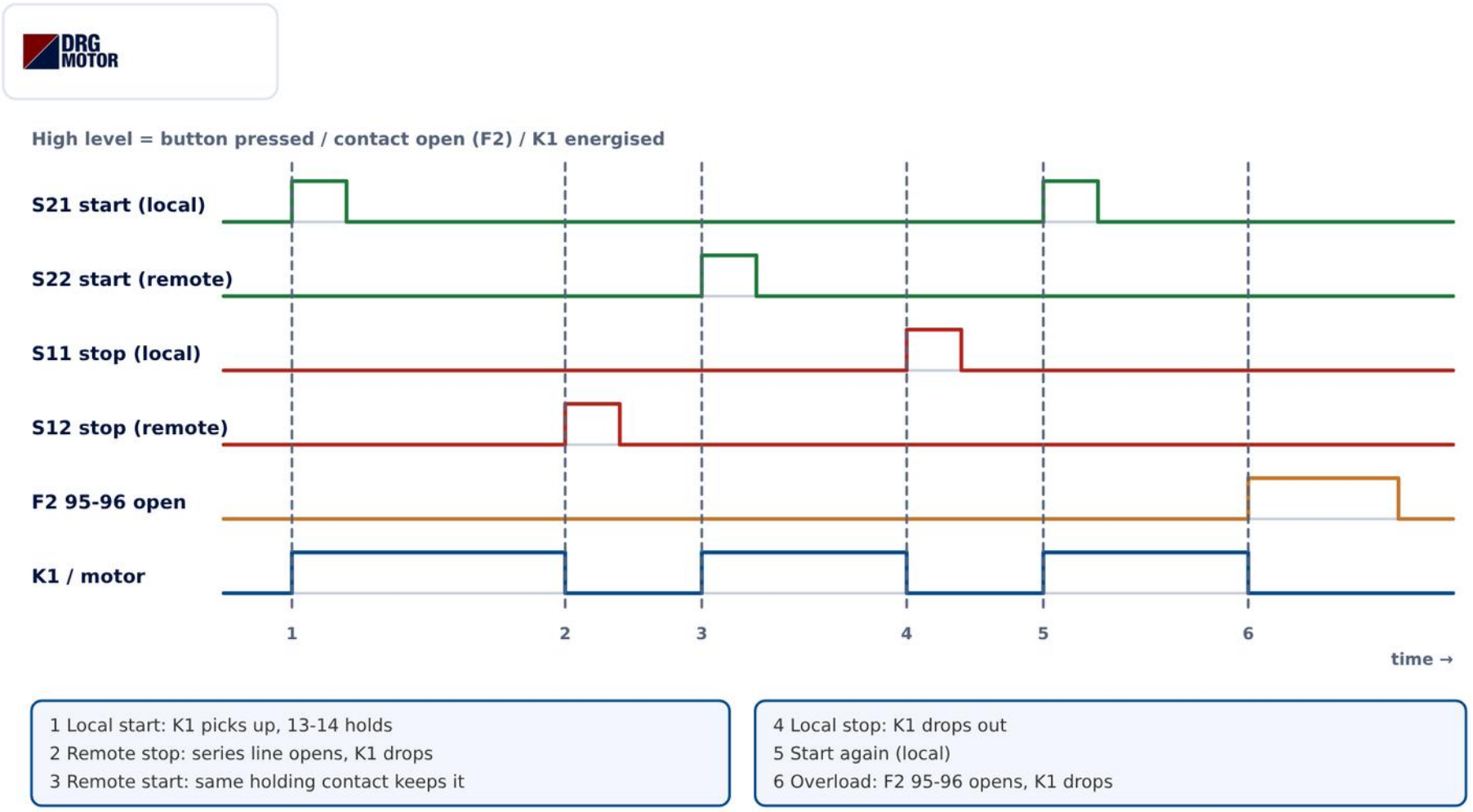
Figure 3



Terminal and core wiring (X1:1-2-3)

S12-12 is jumpered to S22-13 in the remote box, so 3 cores serve both buttons · terminal numbers are examples

Figure 4



Operating sequence — timing diagram

Whichever station starts the motor, both stops can stop it

Figure 5

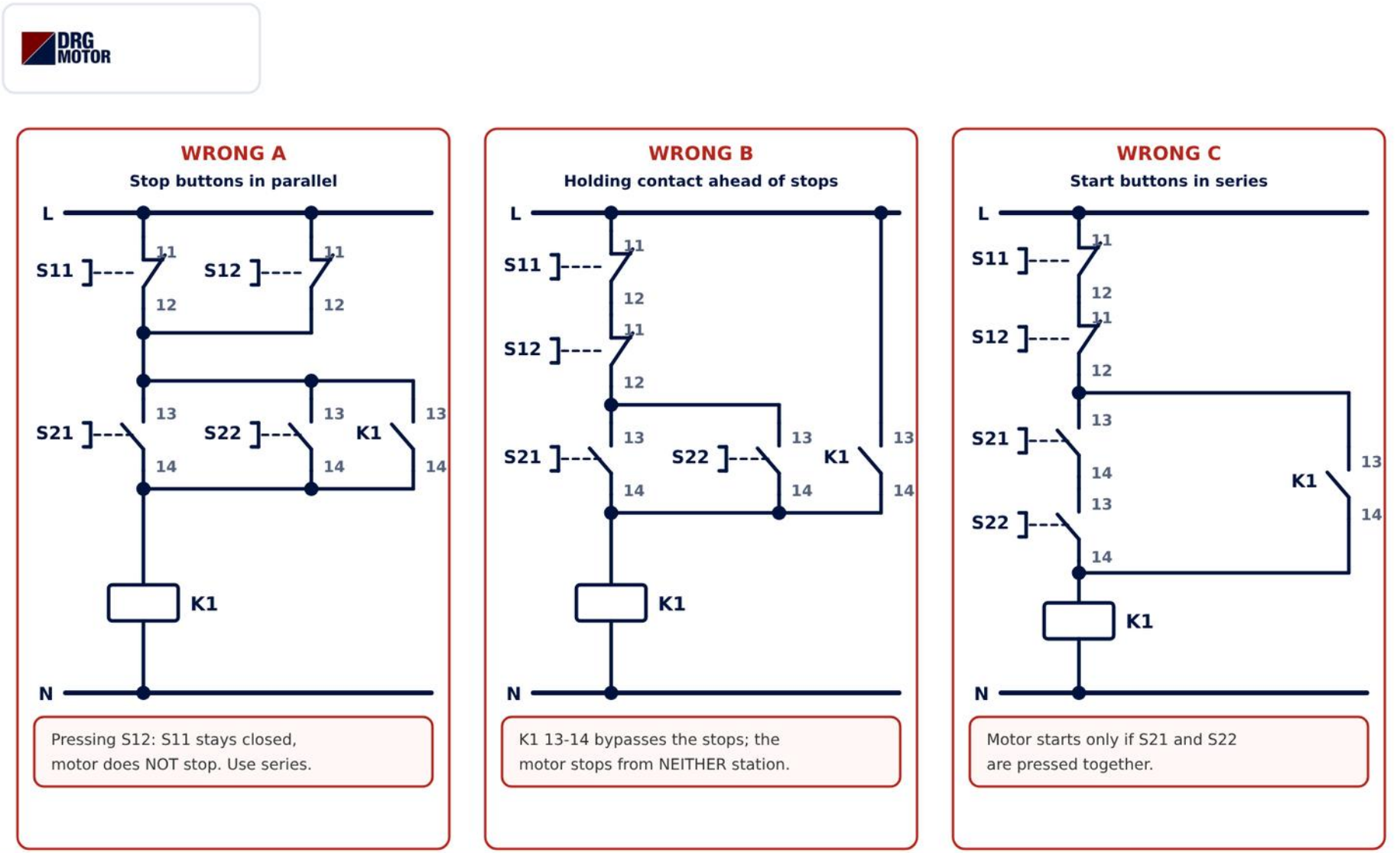

WRONG A
Stop buttons in parallel
L
S11
S12
S21
S22
K1
N
11
12
13
14
Pressing S12: S11 stays closed, motor does NOT stop. Use series.
WRONG B
Holding contact ahead of stops
K1 13-14 bypasses the stops; the motor stops from NEITHER station.
WRONG C
Start buttons in series
Motor starts only if S21 and S22 are pressed together.
Common wiring mistakes in two-location control
Correct: stops in SERIES (NC), starts and K1 13-14 in PARALLEL (NO) — see the control circuit diagram

Figure 6