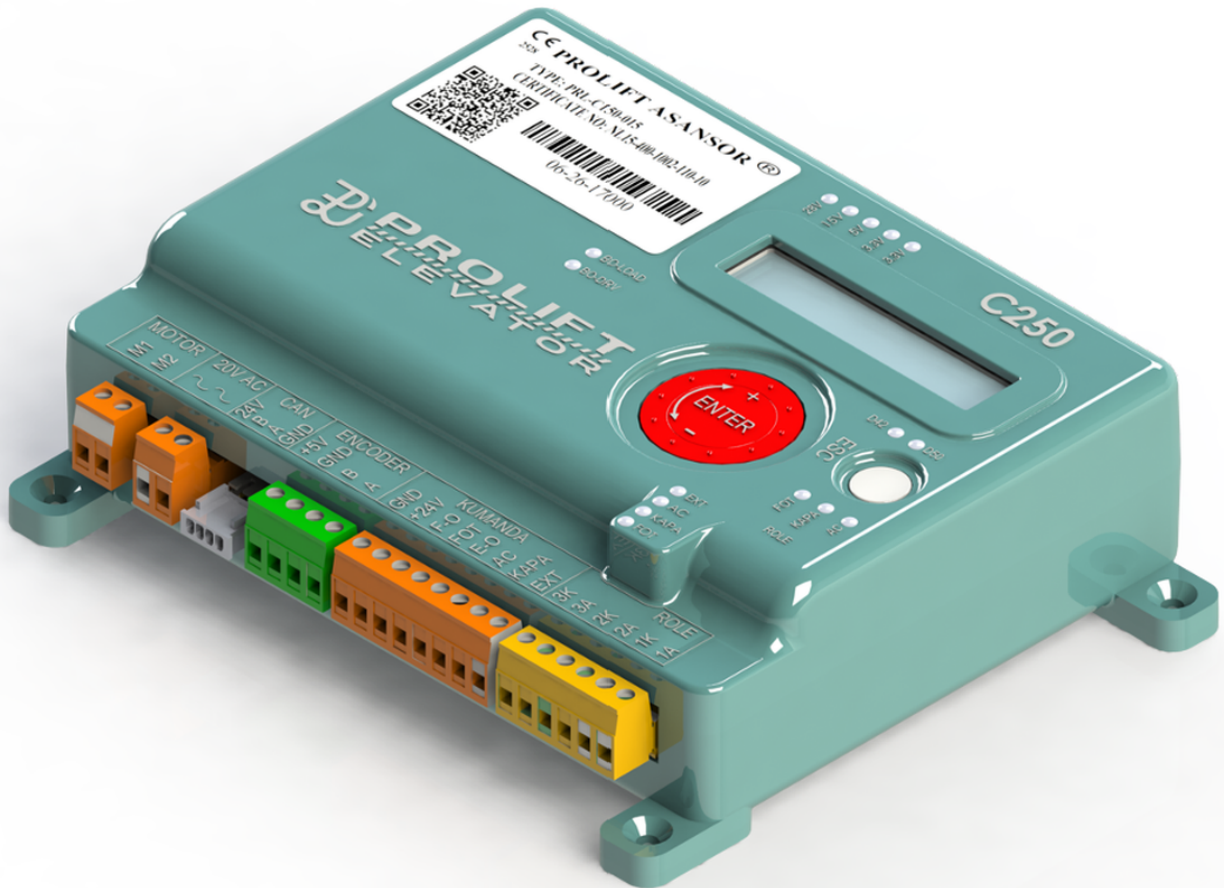




C250

AUTOMATIC DOOR CONTROL CARD

OPERATION AND SAFETY MANUAL

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BRDC_V0.07 English edition, 14 September 2026. Applies to V7R19: local Bluetooth control, phone access, panel handover and revised E01/E06 recovery.

1 INTRODUCTION

The BRDC C250 is a door control board for 24 VDC geared elevator-door motors. It uses dual-channel incremental encoder feedback and manages position-based opening and closing profiles. This manual describes the actual menu and protection behavior of the BRDC_V0.07 firmware, with applicability to source revision V7R19. English edition dated 14 September 2026.



Commissioning and service work must be performed only by qualified personnel. The board does not replace the elevator safety circuit.

BRDC V0.07 functional scope

Function	Behavior in this release
Command inputs	Separate OPEN and CLOSE inputs for standard doors. For semi-automatic doors, the DOOR OPEN line is a two-level direction selector and DOOR CLOSE is not used.
Position and speed	Door position from the A/B encoder, cm/s speed profiles, opening/closing ramps and separate lock-entry/lock-exit speeds.
Door learning	Open/closed endpoint verification using fixed-current contact and motion proof; 50-180 cm travel storage with atomic Flash journaling.
Obstruction	Safe stop/reopen during normal closing at the user-set current threshold. This threshold is disabled in the skate/lock zone; the independent 8 A hard limit remains active.
Monitoring	2x16 LCD, Turkish/English menu, cycle counter, E01-E15 indications and the last 10 stored faults. New E10 conflicts are not stored.
Protection	Monitoring of motor current, encoder/motor feedback, driver temperature, DC bus, thermostat, ADC and RTOS watchdog.

Scope limitations

- Only the inputs and outputs listed in the terminal section of this manual are controlled directly by BRDC_V0.07.
- Battery rescue, fire mode and nudging are not local menu functions. Phone PIN access and Bluetooth operation are explained in Sections 10-11.
- Repeat door learning whenever motor or encoder direction, encoder PPR, gear ratio or pulley circumference changes.
- Clearing a fault code or raising a threshold is not a repair. First eliminate the mechanical, electrical or sensor-related cause.

2 TECHNICAL SPECIFICATIONS

Section	Item	BRDC_V0.07
Power	Input / protection	18-24 VAC / 8 A fuse
Motor	Supply / limit	24 VDC, maximum 8 A / 200 W
Encoder	Type / supply	Dual-channel incremental encoder, 5 VDC
Preset geometry	Motor profile	PROLIFT=256 PPR / 13.4 cm; KORMAS=100 PPR / 15.0 cm
Encoder	PPR setting	8-2048 PPR / 1 PPR; other value=USER CONFIGURED
Geometry	Gear / pulley	0.1-20.0 / 2.0-100.0 cm
Input	Standard door	Separate DOOR OPEN and DOOR CLOSE inputs
Input	Semi-automatic	DOOR OPEN is a two-level direction selector; DOOR CLOSE is ignored
Output	Relays	Fully open, fully closed, obstruction/photocell; 3 A
Interface	Local control	2x16 LCD, encoder/ENTER and ESC; Turkish/English
Door travel	Learning range	50-180 cm
Speed	Opening / closing	3.5-80.0 / 3.5-65.0 cm/s
Speed	Lock entry	0.5-5.0 cm/s; factory approx. 2.5
Speed	Lock exit	0.5-10.0 cm/s; factory 4.0
Current	Obstruction / hard limit	3.50-8.00 A setting / 8.0 A protection
Protection	Temperature / bus	60 °C fault, 55 °C recovery / 42 V fault, 40 V recovery



Door learning is invalidated when MOTOR SELECTION, encoder, gear or pulley geometry actually changes. If geometry falls outside 1-4096 counts/mm, INVALID GEOMETRY is shown; if the target speed cannot be generated, SPEED NOT VALID is shown. The value is not saved.

3 OVERVIEW

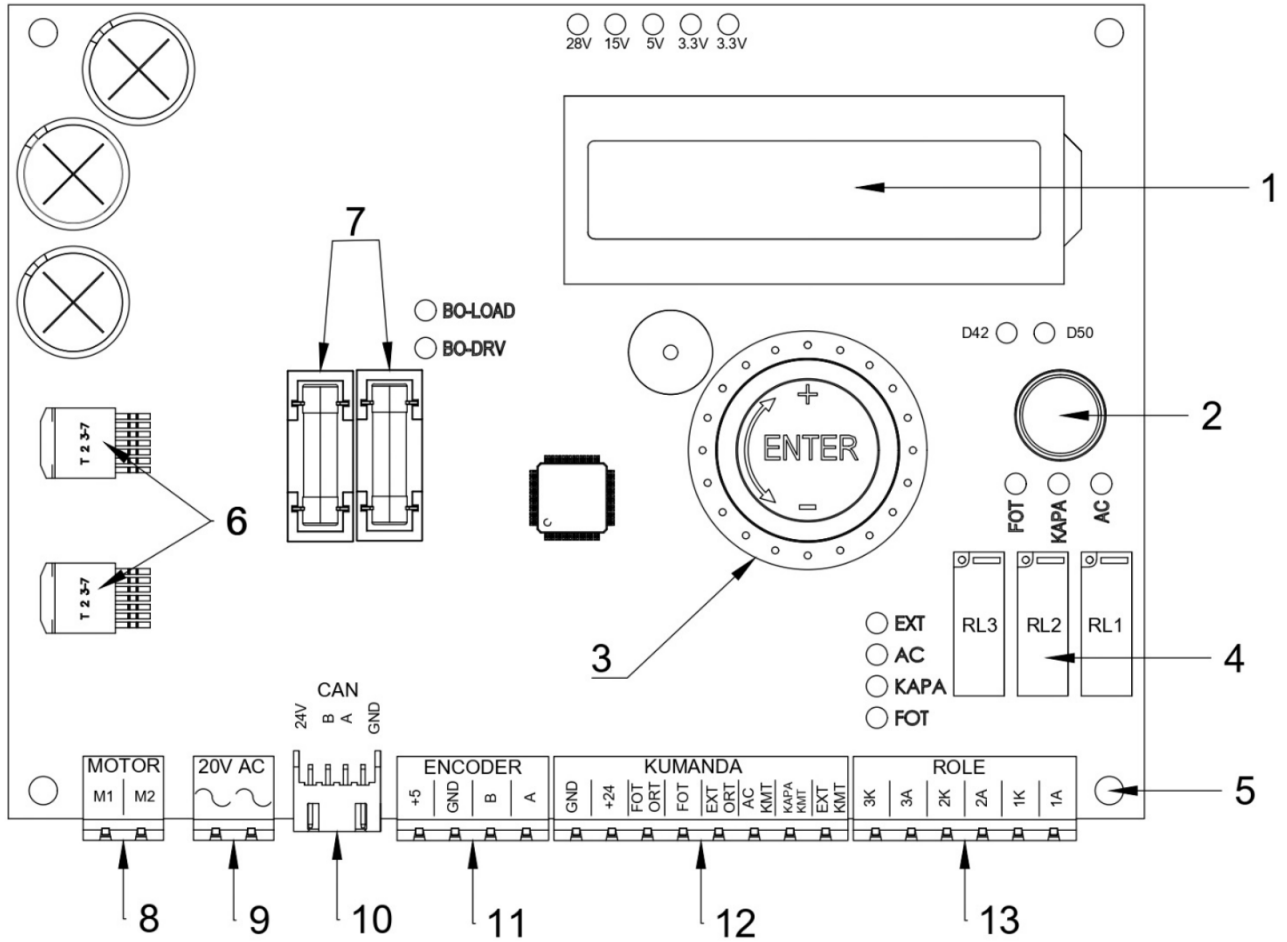


Figure 1: Door controller layout

No.	Component
1	2x16 LCD
2	ESC button
3	Rotary encoder/ENTER knob
4	Relays
5	Mounting holes
6	Motor drivers
7	Input power fuses
8	Motor output terminal
9	AC power input
10	CAN bus connector
11	Encoder connector
12	OPEN, CLOSE, photocell and thermostat control inputs
13	Relay outputs

4 TERMINAL CONNECTIONS

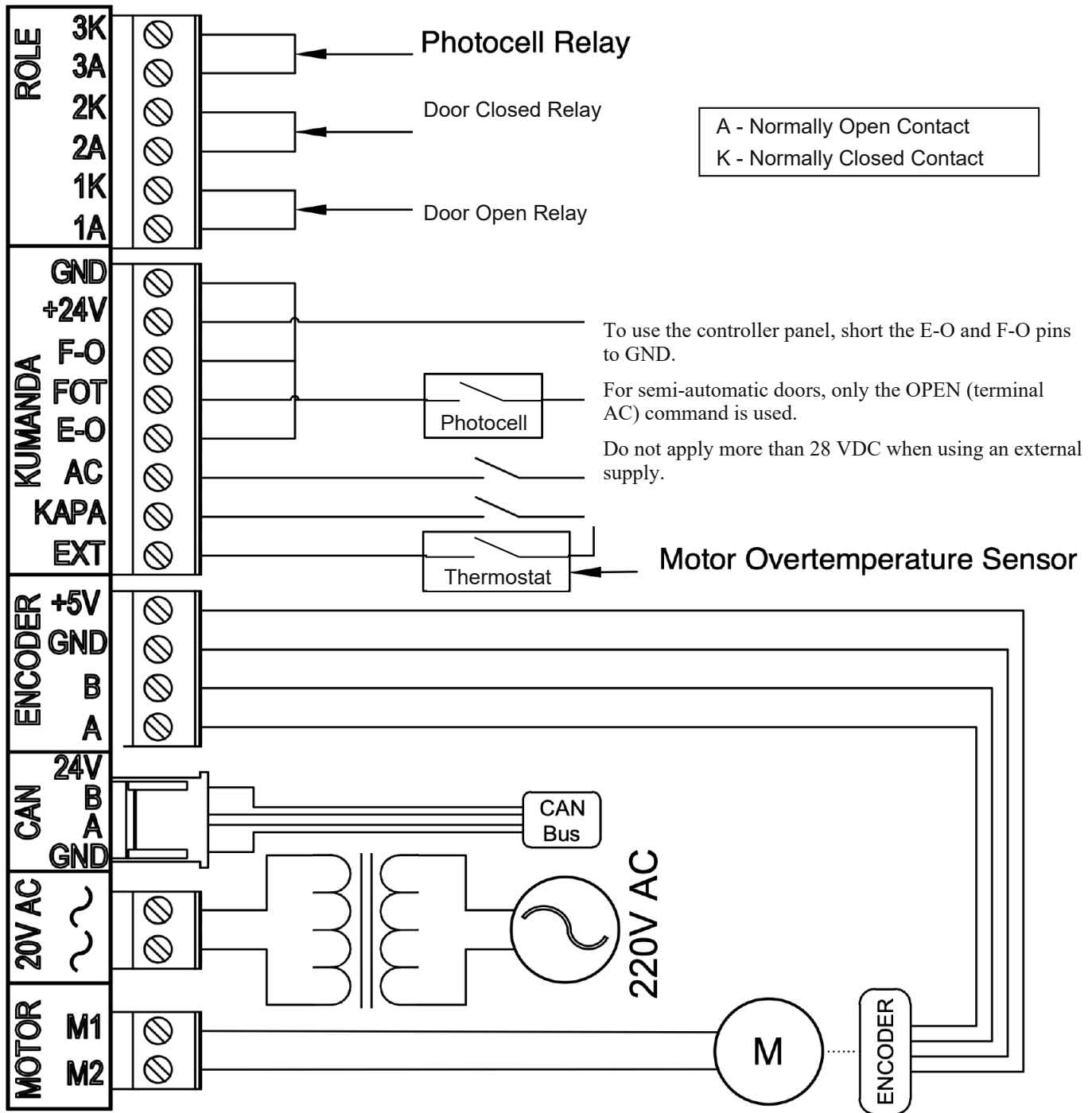


Figure 2: Terminal block connection diagram

V07

V0.07 semi-automatic door: The OPEN input is a two-level maintained direction selector; one level commands OPEN and the opposite level CLOSE. The CLOSE input is not used for this door type. Where a restart interlock applies, change direction and hold it for 200 ms. Qualified E01/E06 recovery may accept the held direction; see Sections 9 and 11.

6 SAFETY AND PRECAUTIONS

- The board supply must be 18-24 VAC. A supply above 24 VAC or an undersized transformer may damage the power stage.
- Use a 24 VDC geared motor rated at no more than 200 W. Disconnect all power before inspecting the motor cable, encoder or terminals.
- Use only a 5 V, dual-channel A/B incremental encoder. When correcting motor or encoder direction, reverse only one connection pair, then repeat door learning.
- Do not apply OPEN and CLOSE simultaneously on a standard door; E10 prevents operation under this condition. On a semi-automatic door, use only the OPEN direction-selector input.
- Do not apply more than 28 VDC to signal inputs. Enable the thermostat function only when a physical motor thermostat is connected.
- The board is not a safety-circuit component. Do not use its relay outputs as a substitute for the elevator safety circuit.
- Panel OPEN/CLOSE inputs are ignored during door learning and read again after successful completion. Keep the photocell path and door travel area clear, release panel commands as a safety precaution, and do not touch the door during learning.
- Raising protection thresholds, bypassing sensors or repeatedly resetting the board is not a repair. Record the displayed code and fault-log details.
- If E01, E04 or E05 recurs, do not continue operation until the mechanical obstruction, motor/encoder connection or learned geometry has been corrected.
- E12 and E15 are startup lockouts that require service. Do not commission the board by changing user parameters.
- Measurements on an energized DC bus or motor circuit must be performed only by qualified service personnel using suitable instruments and insulation.



After a fault: First make the door travel area safe, release all commands and read the detailed subcause in the fault log. Disconnect power before making any wiring or mechanical changes.

7 MENU OPERATION

7.1 Controls, status screen and shortcuts

The status screen refreshes approximately every 500 ms. The top line displays driver temperature, motor current, DC-bus voltage and D status. The bottom line displays speed, position and learned door travel.

26°C 0.0A 28V D1
0cm/s 0/90cm

Indicator	Meaning
°C / A / V	Driver temperature / filtered motor current / DC bus
D0	No valid door-learning data
D1	Valid door-learning data
DM	Demo mode active
cm/s	Instantaneous speed
position/travel	Current position / learned door travel

Button functions

Control	Short action	Press and hold
ENTER	Opens the menu and saves a value.	Opens the advanced menu at startup. In the fault log, hold for 10 s to clear all records.
ESC	Returns to the previous screen. In Manual Control, press and release for a safe exit.	Hold during startup for factory defaults. During operation: 1.5 s stops Demo Mode/learning; 6 s opens the learning question.
ENCODER	Navigates menus and changes values. In Manual Control: clockwise=OPEN, counterclockwise=CLOSE, center=STOP.	No press-and-hold function.



Factory defaults: Hold ESC while applying power. When the confirmation screen appears, ensure ENTER is released, then press ENTER to confirm. The counter, current calibration and language are preserved; learning and fault history are cleared. Bluetooth returns to ON and the access PIN to its factory state. Obtain access details from authorized service.

7.2 MENU FLOW

MAIN MENU - ENTER

1	COUNTER
2	MANUAL CONTROL
3	DEMO MODE
4	SIZE DETECTION
5	DOOR SELECTION
6	MOTOR SELECTION
7	SIGNAL TYPE
8	RELAY TYPE
9	THERMOSTAT
10	LANGUAGE
11	LCD CONTRAST

ADVANCED - HOLD ENTER AT STARTUP

1	ENCODER PULSE
2	GEAR RATIO
3	PULLEY CIRCLE
4	OPEN HOLD PRESS
5	CLOSE HOLD PRESS
6	PINCH PRESSURE
7	OPENING SPEED
8	CLOSING SPEED
9	LOCK ENTRY SPEED
10	LOCK EXIT SPEED
11	OPEN RAMP LENGTH
12	CLS. RAMP LENGTH
13	D. SKATE LENGTH
14	KP
15	KI
16	BLUETOOTH
17	CURRENT VALUE
18	FAULT LOG

V07 BRDC_V0.07 has 11 main and 18 advanced items. A16 BLUETOOTH is local-only; calibration and fault history move to A17 and A18. Phone settings have their own layout.

7.3 MAIN MENU

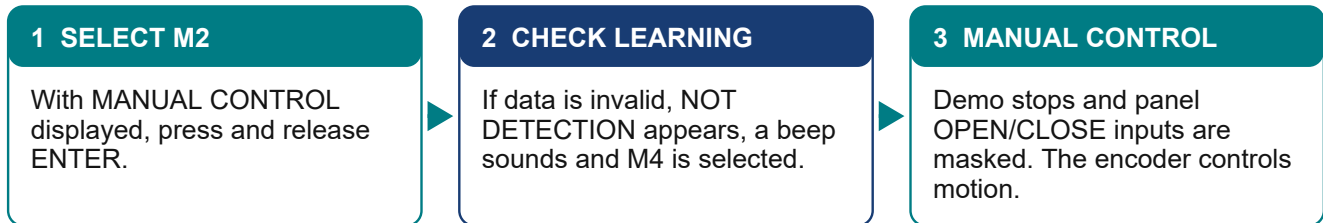
No.	LCD menu	Function and current behavior
1	COUNTER	Displays the total number of completed door cycles.
2	MANUAL CONTROL	With valid learning data, use the encoder to open, close or stop the door. Press and release ESC to exit.
3	DEMO MODE	The confirmation screen does not stop current motion or endpoint holding. ENTER takes control safely. If closing, the door continues to the closed endpoint; otherwise it starts opening. The photocell or ESC stops the mode; phone-started Demo continues after disconnection (Section 11).
4	SIZE DETECTION	Learns the open reference and closed travel using fixed-current endpoint validation. It does not change PINCH PRESSURE.
5	DOOR SELECTION	TELESCOPIC, CENTRAL or SEMI AUTOMATIC. Selecting SEMI AUTOMATIC preserves existing speed and ramp settings.
6	MOTOR SELECTION	Applies PROLIFT=256 PPR/13.4 cm or KORMAS=100 PPR/15.0 cm geometry as a pair. Other values appear as USER CONFIGURED; changing the profile clears learning data.
7	SIGNAL TYPE	Selects OPEN CONTACT or CLOSE CONTACT polarity for OPEN, CLOSE and photocell inputs.
8	RELAY TYPE	Selects OPEN CONTACT or CLOSE CONTACT logic for the status relays.
9	THERMOSTAT	CLOSED/OPEN. Select OPEN only when a physical motor thermostat is connected.
10	LANGUAGE	TURKISH / ENGLISH. The selected language is preserved during a factory reset.
11	LCD CONTRAST	Range 1-499; factory setting 250.



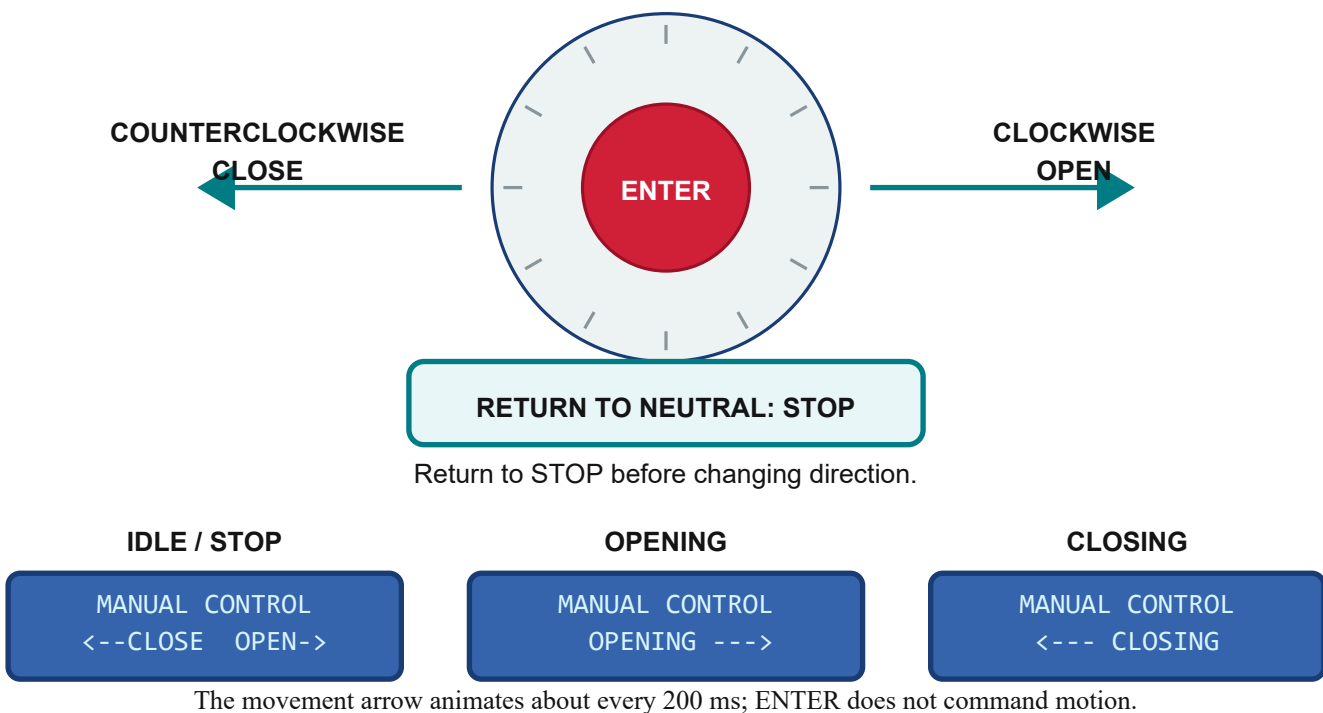
MANUAL CONTROL and DEMO MODE do not start without valid learning data; the LCD displays NOT DETECTION. Invalid MOTOR SELECTION profile geometry displays INVALID GEOMETRY, leaves the setting unchanged and creates no E-code or fault-log record.

7.4 MANUAL CONTROL - ILLUSTRATED GUIDE

Manual Control is available only when valid door-learning data is stored. Clear the door travel area. From the status screen, press ENTER, select MANUAL CONTROL with the rotary encoder, then press and release ENTER.



OPEN - STOP - CLOSE with the rotary encoder



Exiting with ESC: Pressing ESC immediately removes the manual OPEN/CLOSE request and begins a controlled stop. Releasing ESC returns to M2 and sounds a beep. Before exiting, place panel commands in a safe or neutral state; an active panel command may restart motion afterward.



Protections remain active: Photocell, obstruction, overcurrent, temperature, encoder and other motor protections are not disabled. After a manual-control fault, return the encoder to STOP/neutral for at least 200 ms.

7.5 ADVANCED MENU

Hold ENTER at power-up. Turn the encoder to select/change; press ENTER to save or ESC to cancel. Bluetooth requires a fresh ENTER press and release.

No. / menu	Factory	Range	Description
1 ENCODER PULSE	256	8-2048 PPR / 1	Numerical PPR. A change clears learning.
2 GEAR RATIO	9.6	0.1-20.0 / 0.1	Motor/output revolution ratio. Relearn after a change.
3 PULLEY CIRCLE	13.4 cm	2.0-100.0 cm / 0.1	Circumference, not diameter. Relearn after a change.
4 OPEN HOLD PRESS	55	10-140 / 1 PWM	Open holding maximum; current above 3 A may reduce it.
5 CLOSE HOLD PRESS	40	10-140 / 1 PWM	Closed holding maximum; current above 3 A may reduce it.
6 PINCH PRESSURE	4.50 A	3.50-8.00 A / 0.01	Normal closing obstruction threshold; learning preserves it.
7 OPENING SPEED	Approx. 55.9	3.5-80.0 cm/s / 0.1	Actual linear speed depends on geometry.
8 CLOSING SPEED	Approx. 41.9	3.5-65.0 cm/s / 0.1	Verify closing force/energy at the installation.
9 LOCK ENTRY SPEED	Approx. 2.5	0.5-5.0 cm/s / 0.1	Entry into the skate/lock zone when closing.
10 LOCK EXIT SPEED	4.0	0.5-10.0 cm/s / 0.1	Exit from the skate/lock zone when opening.
11 OPEN RAMP LENGTH	26.0 cm	Min. 5.0 cm / 0.1	Opening ramp; dynamic maximum noted below.
12 CLS. RAMP LENGTH	27.0 cm	Min. 5.0 cm / 0.1	Closing ramp; the same dynamic maximum applies.
13 D. SKATE LENGTH	4.0 cm	1.0-8.0 cm / 0.1	Skate/lock movement zone at the closed end.
14 KP	320	10-700 / 1	PI proportional gain; expert adjustment.
15 KI	150	10-700 / 1	PI integral gain; expert adjustment.
16 BLUETOOTH	ON	ON / OFF	Local panel only. Confirm with ENTER; see Section 10.
17 CURRENT VALUE	Read-only	-	Board calibration; no user adjustment.
18 FAULT LOG	Last 10	Turn encoder	Newest first. ENTER 10 s clears; ESC exits.



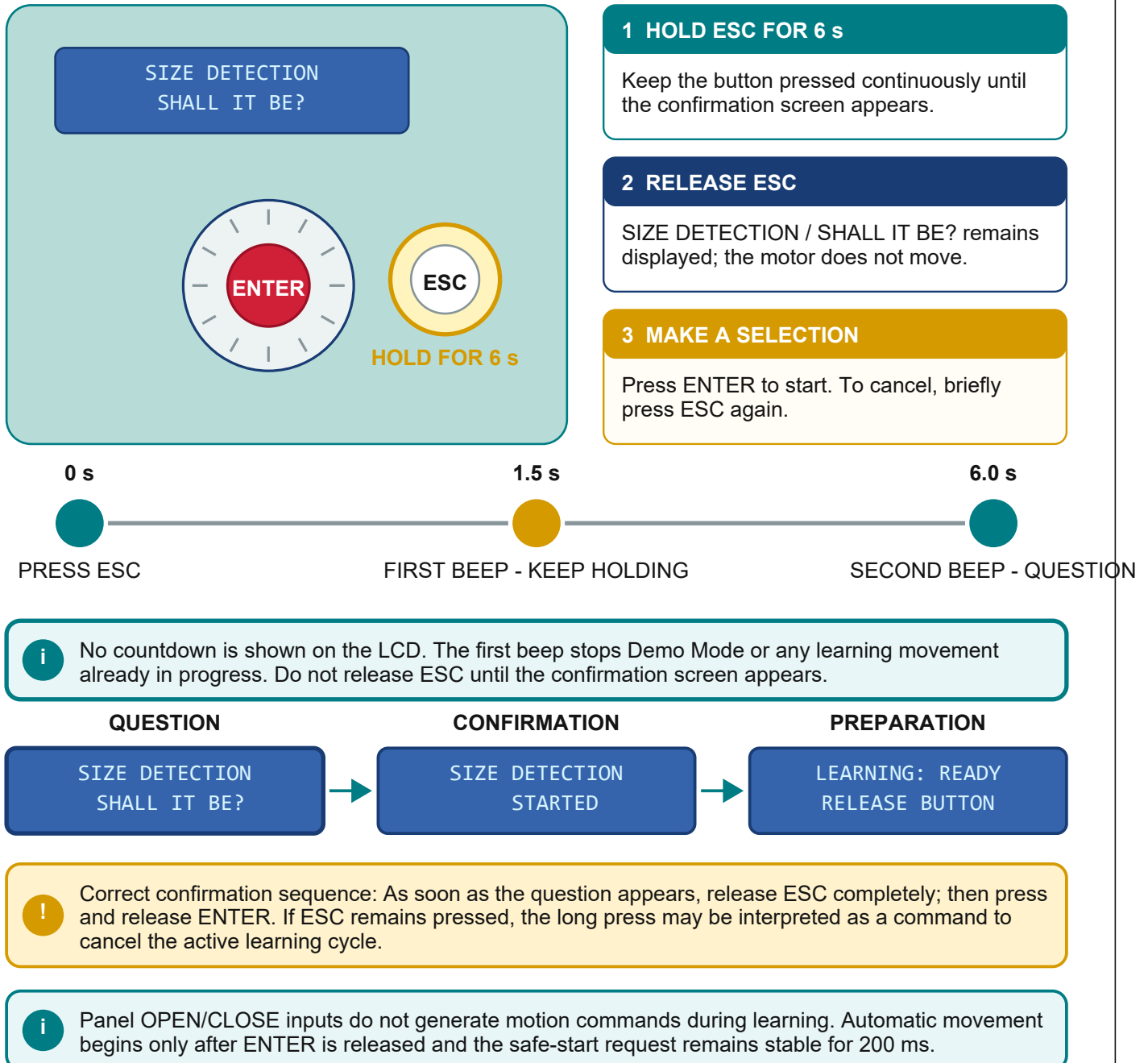
Repeat SIZE DETECTION after changing MOTOR SELECTION, PPR, gear or pulley. PROLIFT/KORMAS presets set PPR and pulley together; other combinations display USER CONFIGURED.



Invalid lock-speed geometry displays SPEED NOT VALID. Local ramp maximum: 50 cm without learning; otherwise half the learned travel, with an absolute 250 cm limit.

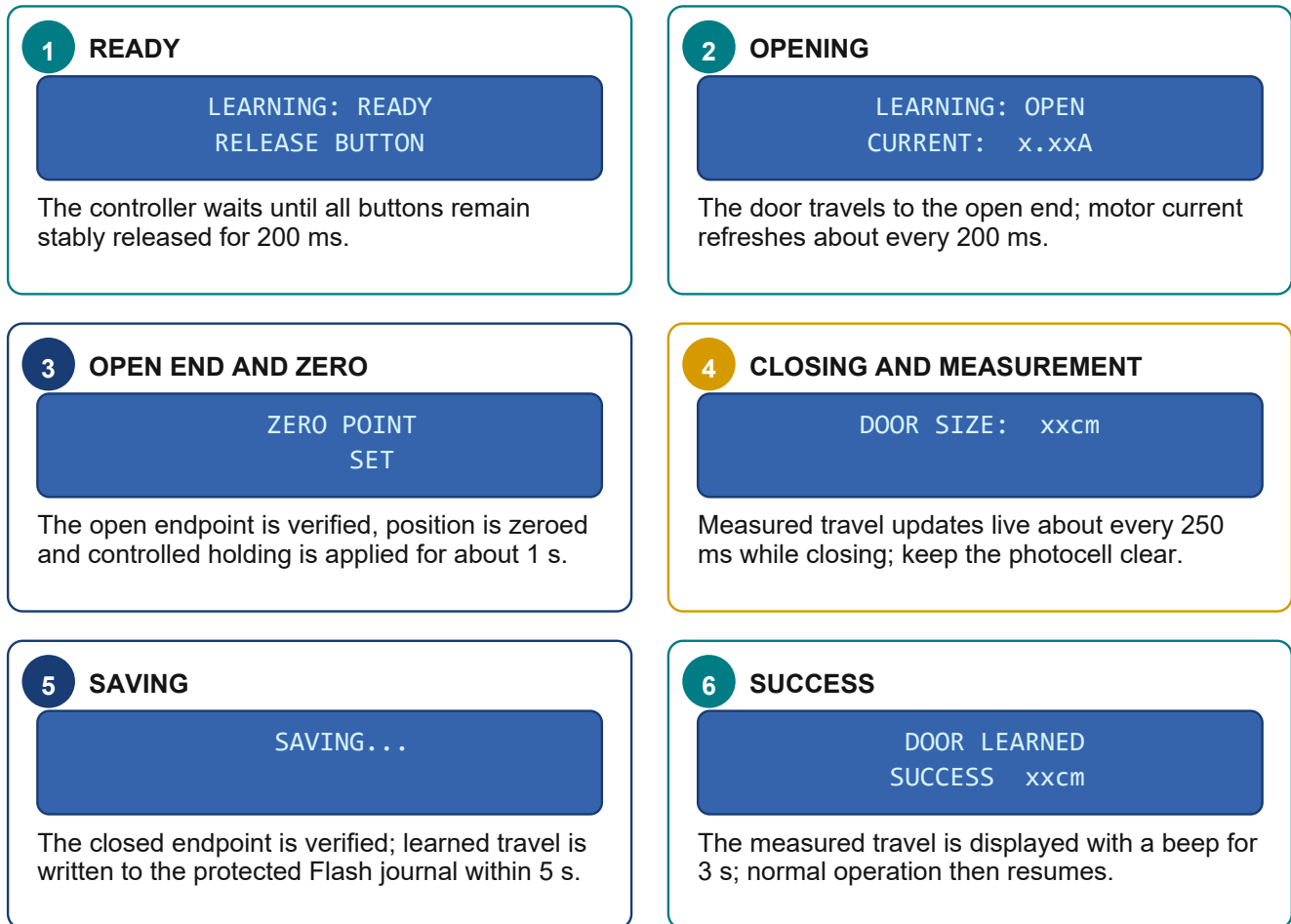
8.1 STARTING DOOR LEARNING WITH THE ESC BUTTON

Start from the status screen. Exit Manual Control, completely clear the door travel area and photocell beam, and verify that no active fault is present on the controller.



8.2 LEARNING SCREENS AND DOOR MOVEMENT

After ENTER is released and the safe-start conditions are verified, the controller automatically executes the sequence below. Do not interfere with the door and keep the photocell beam clear.



Technical validation	BRDC_V0.07 behavior
Motion proof	At least 2 mm of travel in the commanded direction and three fresh samples must be observed within 500 ms; maximum travel time in each direction is 30 s.
Endpoint current	Opening starts at 4.0 A. If the first 400 mm of physical opening provides at least 300 mm valid coverage, at least 20 samples and average current >3.5 A, opening/closing thresholds become 5.0 A/4.0 A. Otherwise they remain 4.0 A/3.5 A. For center-opening doors, corresponding motor travel is 200/150 mm.
Travel and contact	The lower limit is normally 50 cm and is calculated dynamically from endpoint zones; the upper limit is 180 cm. Excessive stretch or rebound after contact is rejected.
Save result	PINCH PRESSURE is unchanged. The new result is stored atomically with the NORMAL/100% ramp record.
Normal movement	OPEN/CLOSE inputs are separate for telescopic and center-opening doors. On semi-automatic doors, only OPEN is the direction selector. Lock Exit Speed is used while opening; Lock Entry Speed at the end of closing.

ESC Cancel: Holding ESC for 1.5 s during learning stops movement, sounds a beep and invalidates the partial measurement without generating E14. A short ESC press does not cancel movement.

! Fault: If MOTOR DIRECTION / REVERSED or E14 LEARN ERROR appears, the controller de-energizes the motor and relays, records the subcause and resets after about 3 s. Correct the cause using the E14 table and repeat learning.

9.1 FAULT MESSAGES - E01-E04



A held panel command may resume after qualified E01 recovery. Isolate the equipment before servicing. Record the fault; do not bypass protection.

E01 OVERCURRENT

Trigger / behavior: Motor current reaches 8.0 A; drive and relays are de-energized.

Possible field causes: Binding, shorted motor/cable, excessive holding, or power-stage/current-sensor fault.

Checks and corrective action: Make the area safe. Isolate power; check free movement, M1/M2 wiring and current sensing.

Clearing condition: Raw and filtered current below 0.30 A for 1 s. Qualified panel recovery accepts one valid direction stable for 200 ms. First nine independent events may recover; the tenth consecutive event latches SERVICE REQUIRED.

E02 CURRENT ADC

Trigger / behavior: No current sample is available, or its age exceeds 20 ms; drive is disabled.

Possible field causes: ADC/DMA or sensing failure, supply fault or software interruption.

Checks and corrective action: Release commands; perform one safe power cycle. Repeated faults require ADC/supply service.

Clearing condition: A fresh sample is available; no command is active; raw and filtered current stay below 0.30 A for 1 s.

E03 REFERENCE

Trigger / behavior: A safe endpoint reference cannot be verified, or travel exceeds the learned value by 10 mm.

Possible field causes: Wrong encoder scale/direction, transmission slip, mechanical change or rollback.

Checks and corrective action: Check motor/encoder direction, profile, PPR, gear and pulley; correct the cause and relearn.

Clearing condition: No command is active; raw and filtered current remain below 0.30 A for 1 s.

E04 ENDPOINT

Trigger / behavior: Endpoint verification exceeds 10 s, or the end cannot be retained after two reacquisition attempts.

Possible field causes: Unreachable endpoint, wrong geometry, slip, obstruction or inadequate holding.

Checks and corrective action: Check mechanism, encoder and travel. Relearn after correction; do not keep resetting.

Clearing condition: A single non-conflicting event may reset after 5 s. Ten attempts for the same code are permitted; the 11th latches SERVICE / RESET.

9.2 E05 ENCODER/MOTOR SUBCAUSES

E05 is generated when motion direction, encoder progress, PWM ownership, endpoint holding or motor-current feedback is inconsistent. Use the sub-message on the second line of the fault log.

Fault-log sub-message	Meaning / possible cause	Checks and corrective action
STANDBY FORCE	At minimum holding, current remains at or above 3 A for 1 s; binding or excessive holding may exist.	Free the mechanism; verify holding pressure and current measurement.
STOP OWNER FAULT	The controlled-stop source does not match drive direction.	If repeated, have control ownership, firmware and power output inspected.
ARREST TIMEOUT	Speed does not fall below 15 rpm within 750 ms; inertia, slip or encoder-speed error may exist.	Check transmission, encoder connection and PI/braking settings.
HOLD ESCAPE	A second deviation over 10 mm from the standby target indicates external force or slip.	Check belt, pulley, coupling and holding pressure.
REVERSE TIMEOUT	Control cannot transfer to the reverse direction within 750 ms after an endpoint.	Check command/direction transition, motor motion and power stage.
STANDBY STATE	Standby PWM, phase or direction state is inconsistent.	Not a user setting; repeated faults require controller/firmware service.
STANDBY CURRENT	Standby PWM is above 10 while current stays below 0.03 A for 750 ms.	Check motor circuit, power output and current sensor.
OUTPUT OWNER	The bridge or PWM appears energized without a valid control owner.	Do not operate; have the output stage and firmware inspected.
HOLD AUTHORITY	Endpoint ownership, direction, PWM channel or safety authority is inconsistent.	Have endpoint reference and output control inspected.
HOLD CURRENT	Holding PWM is above 10 while current stays below 0.03 A for 750 ms.	Check motor cable, power stage and current sensing.
WRONG DIRECTION	After 300 ms tolerance, three samples show motion in the opposite direction.	Disconnect power; correct either the motor pair or encoder A/B pair, then relearn.
NO ENCODER MOVE	No movement of at least 1 mm in the commanded direction for 2.5 s.	Check obstruction, encoder connector/coupling and transmission.
NO MOTOR CURRENT	PWM is above 25%, current below 0.03 A and no motion is detected for 1.75 s.	Check motor cable, power stage, fuse and current sensor.



A single non-conflicting E05 may reset automatically after 5 s. Up to 10 attempts are allowed for the same code; the 11th latches SERVICE / RESET. A verified complete closing cycle clears the automatic-reset sequence for that fault.

9.3 FAULT MESSAGES - E06-E08

E06 DRIVER TEMPERATURE

Trigger / behavior: Driver temperature reaches 60 °C or higher; the motor is inhibited.

Possible field causes: Poor ventilation, high ambient temperature, frequent cycling, friction, excess holding or NTC fault.

Checks and corrective action: Make the area safe; let the driver cool. Check ventilation, duty cycle and friction.

Clearing condition: Temperature must fall to 55 °C or below. Qualified recovery may accept a held panel direction stable for 200 ms. First nine independent events may recover; the tenth consecutive event latches SERVICE REQUIRED.

E07 HIGH VOLTAGE

Trigger / behavior: DC bus reaches 42.0 V or higher.

Possible field causes: High input voltage, mains surge, regenerative energy or bus-sensing error.

Checks and corrective action: Release commands. Authorized service must check input voltage and the bus/braking system.

Clearing condition: Clears automatically at 40.0 V or below.

E08 THERMOSTAT

Trigger / behavior: Thermostat protection is enabled and the active-low input is active.

Possible field causes: Motor overheating, incorrect wiring/contact type, or enabling an unused input.

Checks and corrective action: Let the motor cool. Isolate power and check thermostat/wiring; do not bypass a real sensor.

Clearing condition: The physical input becomes inactive, or an authorized setting corrects an incorrectly enabled unused input.



E01/E06 recovery is conditional, not permission to continue a recurring fault. A held command may restart the door. Existing faults/interlocks remain effective; SERVICE REQUIRED does not clear merely because temperature/current falls.

9.3 FAULT MESSAGES - E09-E10

E09 ADC / SENSOR

Trigger / behavior: NTC or DC-bus ADC2 data remains unhealthy for 750 ms.

Possible field causes: Open/shorted NTC or divider, ADC reference/supply fault, connector/soldering fault or sampling failure.

Checks and corrective action: Disconnect power and inspect NTC and sensing connections. Live DC-bus measurements must only be performed by an authorized technician.

Clearing condition: Three consecutive valid samples are obtained on both channels.

E10 INPUT CONFLICT

Trigger / behavior: OPEN and CLOSE are active simultaneously on a standard door; movement is inhibited.

Possible field causes: Panel/PLC logic error, welded relay contact, wiring bridge or short circuit.

Checks and corrective action: Remove both commands and ensure only one input is active. Check panel relays and wiring.

Clearing condition: Releasing either input allows the remaining command to continue. No new E10 entry or fault count is stored; previous entries remain. E10 is not generated for semi-automatic doors.



For semi-automatic doors, OPEN is a 25 ms filtered two-state direction selector; CLOSE is ignored.



If a restart interlock applies, release both standard-door inputs for 200 ms. On semi-automatic doors, change the selector direction and hold it for 200 ms. Qualified E01/E06 recovery and ordinary phone disconnection follow the separate rules in Section 11.

9.4 FAULT MESSAGES - E11-E13

E11 RTOS WATCHDOG

Trigger / behavior: The control heartbeat exceeds 100 ms, or the HAL time base stalls for 50 ms.
Possible field causes: Software lockup, severe EMI, unstable supply, clock/time-base fault or hardware failure.
Checks and corrective action: The bridge and both PWM channels are disabled immediately. The independent watchdog resets the system after about 750 ms and logs E11. If repeated, inspect power quality, grounding, EMI and firmware.
Clearing condition: A safe input interlock is applied after reset.

E12 FLASH CONFIGURATION

Trigger / behavior: The configuration key, schema or CRC is invalid and the safe backup bank is unavailable.
Possible field causes: Incompatible/corrupted Flash data, incorrect firmware image, interrupted programming or Flash-cell fault.
Checks and corrective action: SERVICE REQUIRED appears at startup and the motor cannot start. Authorized service must verify the correct BRDC_V0.07 image, configuration banks and controller calibration.
Clearing condition: Cannot be cleared by the user; service intervention is required.

E13 FLASH WRITE

Trigger / behavior: Configuration semantics, full-snapshot programming or journal append cannot complete safely.
Possible field causes: Unstable supply, Flash programming failure, invalid setting or worn Flash area. Detail 1=semantics, 2=snapshot/programming, 3=journal append.
Checks and corrective action: Release commands and wait for a safe save interval. A snapshot is retried up to three times, then may remain blocked until a new request or power cycle. Repeated faults require supply/Flash service.
Clearing condition: A single non-conflicting event may reset after 5 s; the 11th occurrence latches the service lock.



A low DC bus may delay safe learning and writing, but is not by itself an E13 cause. Motor start requires at least 20 V stable for 250 ms; Flash journaling requires at least 22 V stable for 500 ms.

9.5 E14 LEARNING-FAULT SUBCAUSES

The second line of the E14 display and fault-log entry identifies the actual subcause. Record the message and perform the corresponding checks.

Sub-message	Possible cause	Checks and corrective action
MOTOR DIRECTION	Encoder travel is opposite the commanded direction.	Disconnect power; correct either the motor-wire pair or the encoder A/B pair, but not both, and repeat learning.
LEARN GEOMETRY	PPR is below 8, the gear/pulley or counts/mm value is invalid, or a safe target speed cannot be produced.	First check the MOTOR SELECTION profile. For a custom mechanism, correct ENCODER PULSE, gear ratio and pulley circumference.
LEARN CURRENT	Closing could not inherit the valid 4.0/5.0 A opening threshold selected over the first 400 mm of physical opening; center-opening motor travel is 200 mm.	Repeat learning. If it recurs, check the open-end stage, current sampling and calibration.
NO END PROOF	After the target profile is reached, 2 mm of motion and three fresh samples are not confirmed within 500 ms, or current rises before motion is proven.	Check the brake, obstruction, motor output and encoder connection.
CONTACT MOVING	More than 5 mm forward stretch or more than 1 mm rebound is detected after current contact.	Remove false obstruction and correct belt elasticity, a loose coupling or a false current peak.
SLOWDOWN TIME	The endpoint-current threshold is not confirmed for at least 10 ms with three fresh samples within the 50 ms power window.	Check current sampling, mechanical contact and door-speed stability.
CONTACT VERIFY	The current, speed and position envelope do not jointly confirm safe endpoint contact.	Check that no real endpoint obstruction exists; verify encoder motion and current measurement.
END SETTLE	After current cutoff/holding transition, the endpoint position does not remain stable for 100 ms and four fresh samples.	Check belt tension, back-driving, coupling and holding pressure.
END TIMEOUT	Endpoint search or verification does not finish within the permitted time.	Clear the travel path and verify door travel/geometry, motor power and the endpoint mechanism.
DOOR SIZE ERROR	Measured travel is below the dynamic lower limit or above 180 cm.	Measure and correct the actual opening, skate/ramp zones and encoder geometry.
END HOLD ERROR	Energized holding, 5 mm retensioning, 100 ms/four-sample stability or the 3 s save handoff fails.	Check rollback, holding PWM, motor current, encoder and supply.
RELAX DISTANCE	Relaxation movement after stopping exceeds the permitted position window.	Check belt/rope elasticity, coupling, braking and encoder mounting.
ZERO OUTPUT ERR	The photocell, fresh-current data, motor authorization or another safety condition is lost during endpoint verification.	Correct the active safety fault and verify the photocell, current sample and motor-output authorization.
END RECHECK ERR	The final position/current recheck fails after stopping and holding.	Check endpoint rollback, vibration, current drift and loose transmission.
CURRENT REF TIME	The running-current reference cannot complete within the permitted time.	Ensure stable movement; check the current sensor, encoder samples and mechanical load.
OPEN CUR MARGIN	There is no safe margin between opening running current and the endpoint-contact threshold.	Reduce opening friction/load and verify the motor, current measurement and geometry.
CLOSE CUR MARGIN	There is no safe margin between closing running current and the endpoint-contact threshold.	Reduce closing friction and check the door-skate mechanism and current measurement.
FORWARD COAST	Forward coasting after power removal exceeds 5 mm.	Check inertia, braking, belt slack and encoder counting.
REVERSE RELAX	Reverse relaxation exceeds 15 mm from the initial current rise or 20 mm from the cutoff point.	Check belt tension, backlash, coupling and encoder counting.



GENERAL: A command was not released within 30 s, movement exceeded 30 s, the photocell beam was interrupted, or save/Flash did not finish within 5 s. Clear the area and check the input, supply and Flash conditions.

9.6 E15 AND FAULT LOGS

E15 CURRENT CALIBRATION

Trigger / behavior: The controller-specific current-divider/offset calibration or the 8.5 A full-scale calibration is invalid.

Possible field causes: Missing production calibration, an incorrect firmware/configuration bank, a sensor fault or a corrupted Flash record.

Checks and corrective action: SERVICE REQUIRED appears at startup and the motor cannot start. This is not a user setting; verify the sensor and calibration using the production/test procedure.

Clearing condition: Only authorized service calibration can clear it.

Using the fault log

01/10 E14 K1234
LEARN GEOMETRY

Advanced menu item 18 FAULT LOG displays the last 10 stored faults, newest first. New E10 conflicts are excluded; old E10 entries remain. The first line shows the entry number/total, fault code and the last four cycle-counter digits at the event. The second line shows the description and, for E05/E14, the detailed subcause. Turn the encoder to navigate; press ESC to exit.



Hold ENTER for 10 s to clear the log. If persistent Flash erase cannot finish within 3 s, SAVE PENDING is displayed; erase is deferred until safe save conditions are available, and this alone is not E13.

Fault group	Clearing / reset behavior
E01 / E06	Qualified panel recovery after physical clearing; first nine independent events, tenth consecutive event locks SERVICE REQUIRED. Details on pages 16/18.
E02 / E03	Fresh healthy current data; raw/filtered current below 0.30 A for 1 s and no active command.
E04 / E05 / E13	A single non-conflicting event resets after 5 s. Ten attempts are allowed for the same code; the 11th latches SERVICE / RESET. A verified full closing cycle clears the sequence.
E07-E10	Clear when the source condition is corrected. E10 clears when either conflicting input is released; no new E10 history is stored.
E11 / E14	E11 resets through the watchdog. E14 de-energizes the motor and relays, attempts to write the log and resets after 3 s.
E12 / E15	Blocking SERVICE REQUIRED conditions at startup; normal operation does not begin.



Held panel commands may resume after qualified E01/E06 recovery or ordinary phone disconnection. Previous safety interlocks remain effective. A SERVICE REQUIRED lock needs authorized service; clearing fault history alone does not repair or authorize the door.

10 BLUETOOTH AND PHONE ACCESS

BRDC_V0.07 supports phone access through a detected Bluetooth module. Use the authorized compatible application and the controller PIN supplied by authorized service. Keep the door travel area visible and clear.

Local Bluetooth setting - advanced menu item 16

Step	Action
1 Open	Hold ENTER during power-up. Select 16 BLUETOOTH and open it with ENTER.
2 Select	Each complete encoder click in either direction toggles ON/OFF. The preview does not apply the setting.
3 Confirm	Press and release ENTER again to apply. Wait for ON SAVED or OFF SAVED. The choice is retained after power loss.
4 Exit	ESC cancels before confirmation. After confirmation, ESC does not undo the accepted operation. The phone cannot enable Bluetooth remotely.

Bluetooth display messages

LCD message	Meaning / action
ON / OFF	Editable preview. ON is the factory setting.
BT CHECKING	Module detection is in progress. Wait; editing is unavailable.
NO BT MODULE	No responding module detected. Have module/wiring checked with power safely isolated.
SAVE PENDING	Permanent save is waiting for safe conditions. Keep power stable.
RADIO STOPPING	Radio shutdown is being confirmed. Wait for OFF SAVED.
ON SAVED / OFF SAVED	The operation is confirmed complete.
BUSY / STORAGE	Another save, PIN change or learning operation blocks the change. Finish it and retry.
STORAGE ERROR	Permanent storage failed. Check supply and arrange service if repeated.
RADIO OFF ERROR	Radio shutdown was not confirmed. Arrange module/connection service; do not assume physical radio isolation.

PIN entry and access lockout

Three consecutive incorrect PIN entries lock phone sign-in on the controller for one hour. Even the correct PIN is rejected during the lockout. A correct entry before the third failure clears the failed-attempt count. Further attempts during lockout do not extend its end time.

Restarting the app, using another phone or toggling Bluetooth does not clear the lockout. Wait for the displayed remaining time to expire. Keep the access PIN private and change it through the authorized application when required. The lockout does not disable panel operation or motor protections.



Switching Bluetooth OFF rejects phone commands and cancels phone-started Demo. Panel commands remain available. Factory reset restores Bluetooth ON and the factory PIN state; obtain access details from authorized service.

11 PHONE, PANEL, DEMO AND MOTION

Which control has priority?

Situation	Controller behavior
Live phone OPEN/CLOSE/STOP	Accepted commands from an authenticated live session override panel inputs. STOP holds phone priority without a direction.
Ordinary phone disconnection	Current panel commands are reconsidered without release/reapplication. A held command may move the door, even after phone STOP. Reverse transfer uses controlled deceleration.
Safety or local service	Faults, photocell, local editing/manual control and learning have priority. Existing safety interlocks are not cleared by disconnection.
Phone-started Demo	Once accepted, Demo continues after connection/app-liveness loss and retains priority over the panel. Disconnecting does not stop it.

Starting and stopping Demo

Valid learning data and healthy safety inputs are required. Confirm DEMO MODE locally or start it from the authorized phone application. If already closing, the door first completes closing; otherwise it opens. Each validated endpoint has a 1.5 s dwell.

To stop phone-started Demo, reconnect with authorized access and use STOP/STOP DEMO, or use the local stop control. On the active Demo screen, press ESC; from the status screen, hold ESC for 1.5 s. Switching Bluetooth OFF also cancels phone-started Demo. Safety cancellation does not restart on reconnection; Demo is not automatically resumed after power loss.

Qualified E01/E06 panel recovery

Recovery applies only when the panel was eligible to operate before the fault and all other safety conditions are healthy. E01 requires raw and filtered current below 0.30 A for 1 s; E06 requires temperature at or below 55 °C. One valid panel direction must then remain stable for 200 ms. Existing interlocks and local service/learning controls remain effective.



The first nine independent E01 or E06 events may recover; the tenth consecutive event of the same code latches SERVICE REQUIRED. A verified complete closing cycle clears the repetition sequence. A held panel command may restart motion after recovery. Make the equipment safe before service.

Opening endpoint and automatic braking

During normal opening, the final 20-10 mm is the crawl approach and the final 10-0 mm is the contact region. These distances refer to one driven leaf, not the combined opening of a center-opening door. Learned geometry and endpoint feedback determine the controlled transition.

Automatic DC-bus braking limits regenerative voltage during permitted motion and controlled reversal. It starts above the captured bus reference by 2 V, limits average braking-resistor power to 5 W, and allows a maximum 5 s braking event. Temperature and motion checks may reduce or stop braking earlier. Direction changes do not renew the budget.



Braking does not replace correct power-supply selection or the 42 V high-voltage protection. Repeated voltage or heating faults require authorized inspection of the supply, braking hardware and door mechanics.

12 TECHNICAL DIMENSIONS

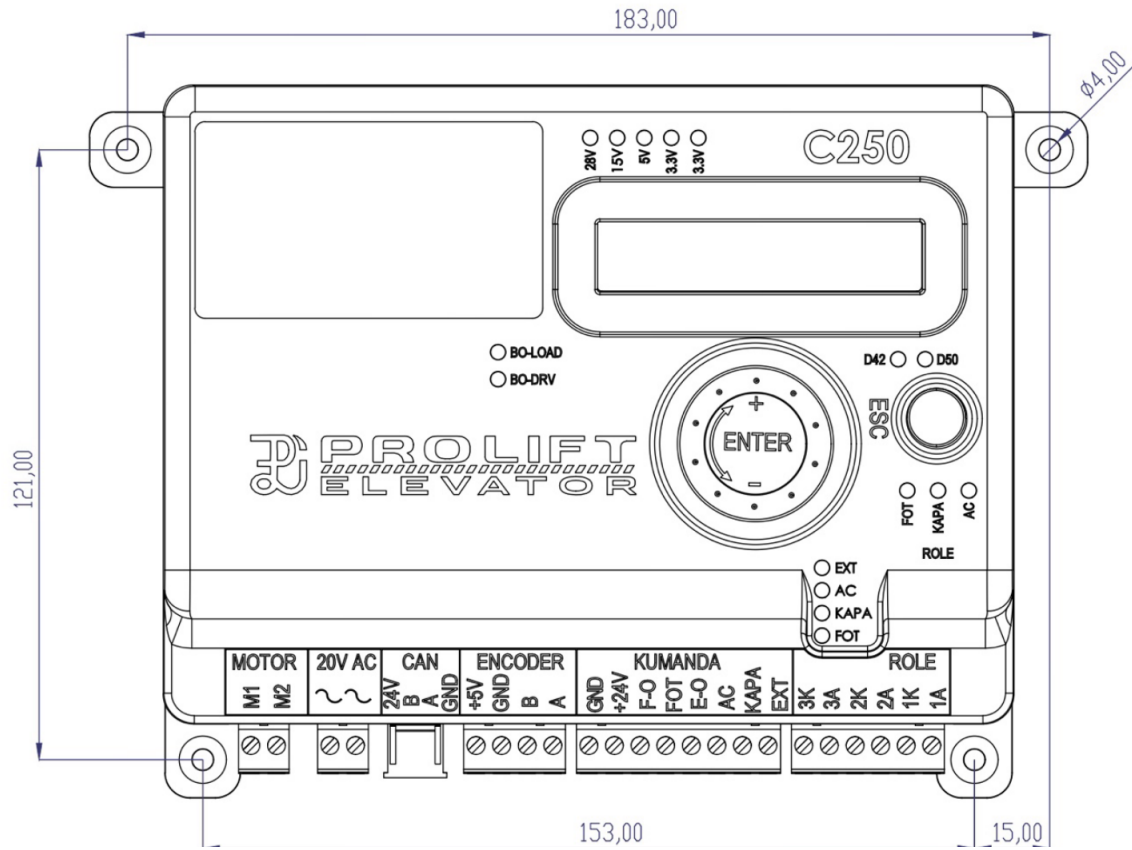


Figure 8: Front view

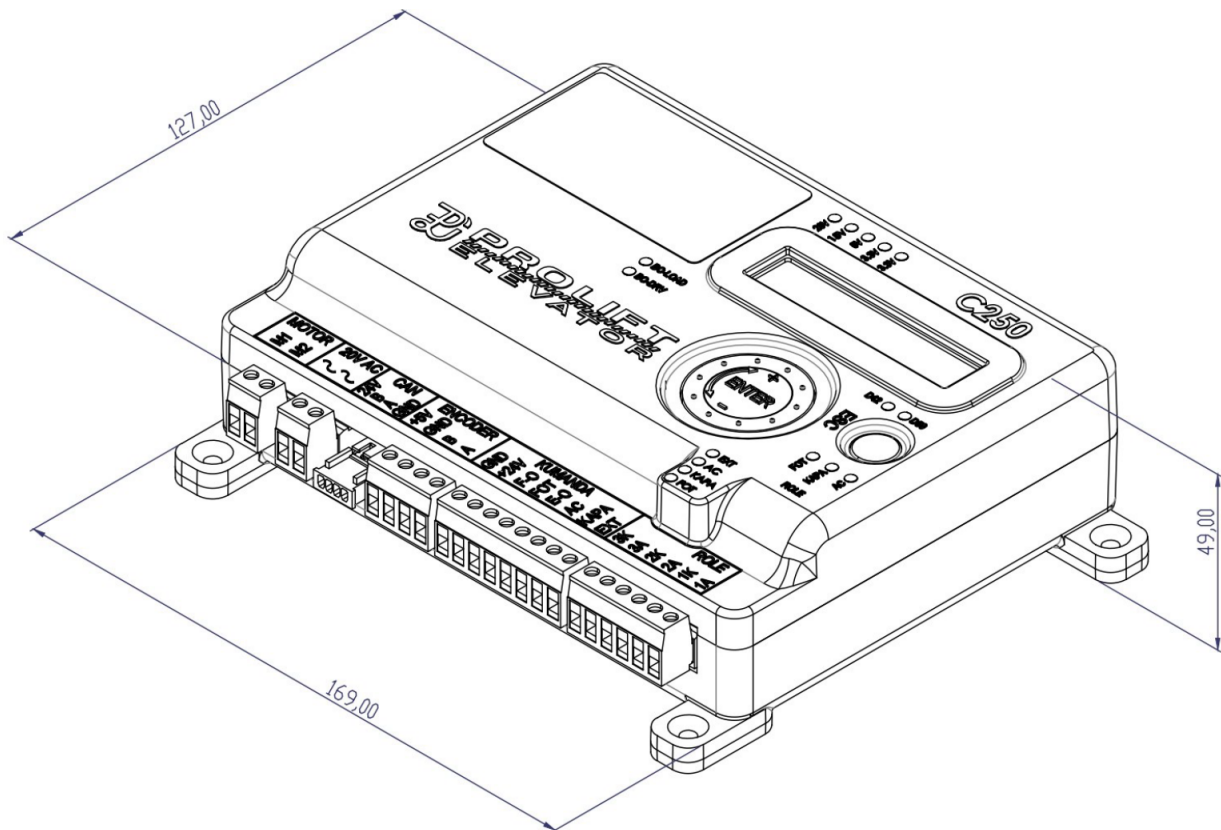


Figure 9: Perspective view