

ROBO BATTLE 2026-2027

Team rules: participation and robot construction

Foreword

Robo Battle is a combat robotics championship organized by the Georgian Robotics Association (GRA). Teams design and build their own remotely controlled robots and compete in different weight classes.

This document sets out the main rules for participation, robot construction, technical inspection and matches. Our goal is to host a safe, fair and engaging competition.

Core principles of Robo Battle

Safety

Protection of competitors, staff and spectators takes precedence over any technical or competitive advantage.

Fair competition

Results should reflect design, engineering, driving ability and strategy; deliberate circumvention of rules is prohibited.

Entertaining combat

Teams are expected to engage actively, use their robots' capabilities and avoid deliberately delaying matches.

Innovation

Original engineering solutions and unconventional mechanisms are encouraged when they meet safety requirements.

Responsibility

Each team is responsible for its robot's construction, technical condition, operation and rule compliance.

Respect and sportsmanship

Participants must respect opponents, judges, staff and the event venue.

Detailed technical and safety requirements appear in the relevant chapters below.

Interpretation of rules and organizer authority

The rules cannot anticipate every robot design or situation. GRA's technical and organizing team will review matters not expressly covered here. The organizer may:

- request additional technical information or safety-related modifications;
- order a repeat technical inspection;
- restrict or prohibit a particular mechanism;
- refuse arena admission if a robot fails to meet the rules or safety requirements;
- stop a match for safety or technical reasons;
- decide matters not expressly addressed in the rules.

The rules may be updated. Changes will appear in the document and be communicated to teams. Participants must review updates. GRA may suspend a robot's participation in cases of serious violations or safety risks.

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1. General rules

1.1 Robo Battle is organized by the Georgian Robotics Association (GRA). This document sets out the principal rules on participation, robot construction, safety, technical inspection and matches.

1.2 Each team is responsible for the safe construction and technical condition of its robot, the accuracy of information submitted and compliance with these rules. The safety of participants, staff and spectators takes priority over any competitive advantage.

1.3 A team intending to use an unusual mechanism, non-standard weapon or function not expressly covered by these rules must obtain GRA's written approval in advance. Such approval does not replace final technical inspection.

1.4 Taking technical inspections and arena capabilities into account, GRA may impose additional safety restrictions, require modifications or refuse a robot admission. The reasons will be explained to the team. If the Georgian and English versions differ, the Georgian version governs interpretation.

2. Participants and teams

2.1 Participants must be at least 16 years old. A team consists of 2-5 members. Participants under 18 require written consent from a parent or legal guardian. Each team must include at least one adult member.

2.2 Each team must appoint a captain who receives official communications and represents the team in technical and organizational matters. No more than two previously designated team members may operate the robot in a match.

2.3 A team may register several robots, including in different weight classes. Each robot must be registered and inspected separately. A single robot may compete in only one weight class during an event.

3. Weight classes and registration

3.1 Robo Battle takes place in the weight classes listed below. Each class has a maximum permitted combat-ready mass.

Category	Maximum mass
GRA Antweight	500 g
Beetleweight	1.5 kg
Hobbyweight	5.4 kg
Featherweight	13.6 kg
GRA Lightweight	27 kg

3.2 Each class requires at least 12 different teams with technically approved robots to hold an official competition. The target is 16 teams. Several robots entered by one team count as one team towards this minimum.

3.3 Teams provide the required contact and technical information at registration, including robot dimensions, weapon type, power sources and other significant mechanisms. GRA will announce the event date, registration procedure and organizational details separately.

3.4 Whether each class runs depends on participant numbers, technical inspection results and arena capabilities. A class name shared with an international competition does not automatically guarantee eligibility at that event.

4. Robot mass and weighing

4.1 Combat-ready mass includes everything installed on the robot or remaining with it in the arena during a match: all batteries, mounts, armor, weapons, cameras, electronics, decorations, tanks, gas, working fluid and other components. No weight exception applies to second or additional batteries, decoration or electronics.

4.2 Only carrying equipment, protective covers and weapon locks removed from the robot and taken outside the arena before the match are excluded from combat-ready mass. The masses of all segments of a multibot are added together.

Robot mass - quick reference

Included in combat mass	Excluded from combat mass
Every battery, including additional installed batteries	Mechanical weapon locks and protective covers
Weapons, armor, mounts and installed modules	A trolley or other equipment used to move the robot
Cameras, electronics, telemetry and decoration	Maintenance tools and removable support equipment

Tanks, working gas or fluid, and every multibot segment

Other equipment not used during the match

Important: Items listed in the right column are excluded from combat-ready mass only if they are removed before the match and taken outside the arena. Any item remaining in the arena counts towards the robot's total mass.

4.3 Robots are weighed in their full combat configuration at final technical inspection and before each match. Replacing a battery, module or other component may require another weigh-in. A robot exceeding its weight-class limit cannot compete.

5. Movement, weapons and multibots

5.1 A robot must be able to move under its own power in a controlled manner, change direction and stop. Merely spinning in place or moving uncontrollably does not satisfy the movement requirement.

5.2 Every robot must have at least one functional active combat mechanism capable of physically affecting an opponent. Examples include spinners, lifters, flippers and gripping mechanisms. A wedge, armor or another passive component alone is not an active weapon.

5.3 The weapon must be controllable independently of the drive system. A separate battery is not required. Any design combining movement and weapon action requires prior approval and demonstration of an active function.

5.4 Multibots consisting of two or more independent segments are permitted if the design is approved in advance. Their combined mass must not exceed the class limit, and each segment must meet the relevant control and safety requirements. No additional weight allowance is granted.

5.5 A multibot is considered defeated if segments representing at least two-thirds of its total mass can no longer continue fighting under the applicable rules. The mass of each segment must be declared in advance.

6. Construction, materials and modifications

6.1 A robot must fit through the arena entrance and the team must be able to bring it in and remove it safely. In its starting position, it must not occupy the entire combat area or prevent the opponent from being placed. The team must declare the robot's dimensions in both its starting and fully deployed configurations.

Robot dimensions: three essential conditions

Arena entrance

The robot must fit through the arena entrance and be capable of safe entry and removal.

Starting position

The robot must not occupy the entire combat area or prevent the opponent from being placed.

Deployed dimensions

Teams declare fully extended dimensions and obtain approval for the design in advance.

6.2 Suitable metal, plastic, rubber and other safe materials are permitted. Glass, easily shattered ceramics, radioactive substances and materials that may release harmful dust or fibers when damaged, or endanger people or the arena, are prohibited.

6.3 Additional magnets, vacuum or similar traction systems require prior approval. Using magnetic or electromagnetic fields to interfere with an opponent's electronics is prohibited.

6.4 Repairs and changes to previously approved and inspected weapon or armor modules are permitted between matches. Each combat configuration must meet weight, safety and active-mechanism requirements. Replacing the entire robot with a prebuilt spare robot is prohibited.

6.5 Changes to the weapon, battery, motor, transmission, main isolator, control-system safety function, pressure system or another significant component must be agreed with technical staff in advance. Reinspection and reweighing are required where necessary.

7. Electrical system and batteries

7.1 The combined nominal voltage of batteries connected in series must not exceed 75 V DC. Teams must declare cell count, nominal battery voltage and maximum fully charged voltage. Every component must be rated for the maximum voltage and current possible in the system.

7.2 Each robot must have at least one battery. There is no upper limit on the number of batteries: teams may use two, three, four or more. Every installed battery counts towards total combat-ready mass. The robot must still comply with its weight-class and voltage limits regardless of battery count. A spare battery not installed on the robot and not remaining in the arena is not included.

Battery quantity and weight - at a glance

Minimum

1 battery

Maximum

No fixed limit

Included in combat mass

Every installed battery

Note: Spare batteries not used in the match and not remaining in the arena are excluded from the robot's combat-ready mass.

7.3 Every robot must have a clearly marked physical main power isolator that is accessible from outside: a suitable mechanical switch or removable power link. The isolator must cut power to the drive system and all hazardous mechanisms. Remote-control or software shutdown alone is insufficient.

7.4 The main isolator must be operable without dismantling the robot or touching a moving weapon. During technical inspection, the team must demonstrate physical isolation of hazardous power sources within 15 seconds. The inspector will agree a separate safe shutdown procedure for a damaged or inverted robot.

7.5 The robot must have a clearly visible power light or indicator showing whether hazardous mechanisms are energized. All independent power sources and isolation methods must be declared to technical staff.

7.6 Teams must comply with the safety rules and manufacturer's instructions applicable to the battery type when mounting, using, transporting, charging and storing batteries. Batteries must be securely fixed and protected against impact and short circuits. Damaged, swollen, leaking or unusually hot batteries must not be used. Charging is permitted only with a suitable charger in the safe area designated by the organizer.

7.7 Before repair or component replacement, hazardous power must be physically isolated, weapons locked and stored hazardous energy made safe.

Essential safety equipment

Component	Purpose	Clause
Physical main power isolator	Disconnect power to the drive and hazardous mechanisms	7.3-7.4
Power status light	Show whether hazardous systems are powered	7.5
Mechanical weapon lock	Prevent unintended weapon movement	9.1-9.2
Protected battery and appropriate charger	Reduce impact, short-circuit and unsafe charging risks	7.6

8. Remote control and fail-safe behavior

- 8.1** Remote-control systems must operate reliably without interfering with other teams. Correct transmitter-receiver pairing and safe operation are checked during technical inspection.
- 8.2** If the radio signal is lost, the transmitter is switched off or the control system loses power, drive and weapon commands must be cancelled immediately. The robot must not continue to act on the last received command.
- 8.3** During a fail-safe stop, drive movement must cease within 30 seconds, and rotating weapons or other hazardous mechanisms within 60 seconds. These limits apply to movement caused by inertia; active commands must be cancelled immediately.
- 8.4** Restoring the radio signal must not automatically restart movement or activate the weapon. Autonomous functions are permitted only when they can be remotely enabled and safely disabled.
- 8.5** Additional radio devices, external antennas or base stations require the organizer's prior approval. Interfering with another robot's control system or intentionally jamming radio signals is prohibited.

9. Weapon safety and prohibited systems

- 9.1** Every hazardous moving weapon, lifter or other mechanism must have a reliable mechanical lock. Locks must be fitted while the robot is in the work area or being transported, and sharp components must have protective covers.
- 9.2** Weapon locks may be removed only on the instruction of an authorized official and under safe conditions. No person may remain within the hazardous movement area when a weapon is activated.
- 9.3** The maximum linear speed of the outermost point of a rotating weapon must not exceed 300 km/h. Teams must provide rotor dimensions, rotational speed and, if requested, speed calculations. GRA may impose additional limits following a technical assessment.
- 9.4** Rotating weapon teeth and other components must be securely attached. Replaceable teeth approved in advance are permitted if they remain firmly attached during combat. Potentially hazardous custom or multi-part rotating assemblies require additional inspection.
- 9.5** Projectiles and weapon parts intentionally launched or detached from the main mechanism are prohibited, including tethered projectiles. A weapon designed to shatter deliberately or destroy itself to damage an opponent is also prohibited.
- 9.6** Flame or high-temperature weapons, fuel discharge, and the use of liquids, gas, powders or glue as weapons are prohibited, as are smoke-generating, explosive and pyrotechnic devices. Closed pneumatic and hydraulic systems are permitted with prior approval and full compliance with relevant safety requirements.
- 9.7** Flying combat robots, internal-combustion engines, nets and entanglement ropes, electrical-shock weapons, electromagnetic pulse (EMP) generators, radio jammers, hazardous lasers or lighting, and mechanisms intended to damage the arena are prohibited.
- 9.8** Energy stored in springs, compressed gas, rotating parts or other mechanisms must be capable of safe release or restraint. Disconnecting electrical power alone does not always mean the robot is safe.

10. Pneumatics and hydraulics

- 10.1** Pneumatic and hydraulic mechanisms are permitted only with prior written approval. Teams must provide a system diagram, gas or fluid type, maximum pressure, technical specifications of tanks and components, and a safe isolation procedure.

System	Maximum permitted pressure
Pneumatics - anywhere in the system	68 bar
Pneumatics - working circuit	25 bar
Hydraulics	200 bar

10.2 Pneumatic systems may use only air or nitrogen. CO₂, oxygen and other gases are prohibited. Tanks, valves, hoses and connections must be rated for the relevant pressure and protected from damage.

10.3 Systems must have pressure monitoring, overpressure protection, a means of safely isolating the pressure source and a way to release residual pressure completely. Unauthorized dismantling or use of damaged pressure components is prohibited.

10.4 Hydraulic fluid must have low toxicity, suit the operating conditions and not create a significant fire or corrosion risk. Hydraulic pressure accumulators and intentional fluid discharge are prohibited.

10.5 If a leak, faulty relief valve, damaged tank or uncertain pressure is identified, the system must not be used until technical staff have re-inspected it.

11. Arena use and safe conduct

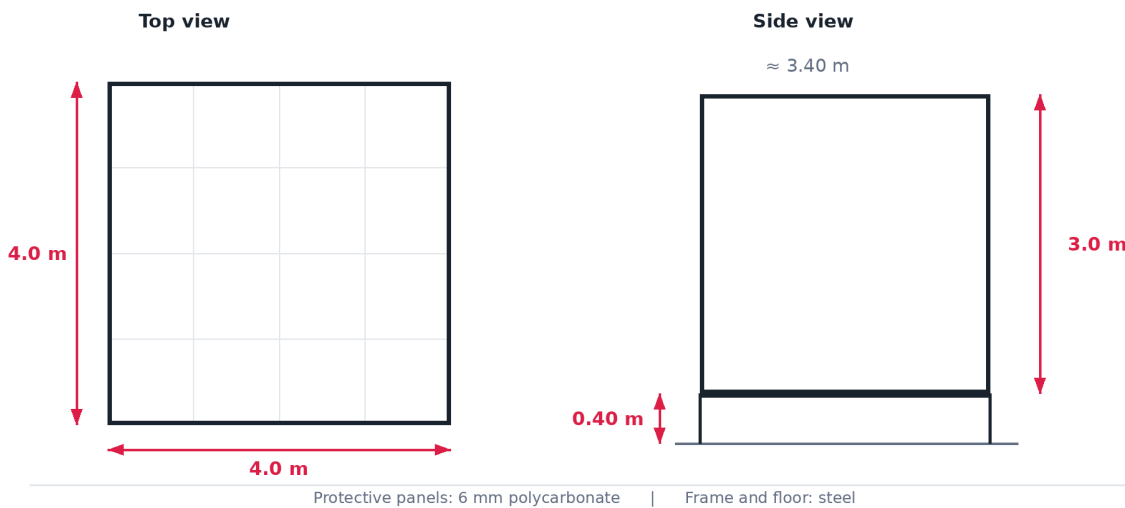
11.1 Weapons and other hazardous mechanisms may be activated or tested only under safe conditions authorized by the organizer and following technical staff instructions. Weapon activation at work tables, in corridors or spectator areas is prohibited.

11.2 Bringing a robot into the arena, activating it, shutting it down after a match and removing it must follow the instructions of the official in charge. Powering up must not cause unexpected movement. Arena doors may be opened only once a safe condition has been confirmed.

11.3 During transport, hazardous power must be isolated, weapons locked and sharp components covered. Heavy robots must be moved using a suitable trolley or another safe method. Damaged robots may be moved only under technical staff supervision.

11.4 The combat arena floor measures 4 × 4 m and the internal height is 3 m. The floor is raised 0.40 m above ground, giving an overall structure height of approximately 3.40 m. The frame and floor are steel, while the protective panels are made of 6 mm polycarbonate. These specifications do not automatically approve every class or mechanism. Final approval depends on a technical assessment of the arena.

Arena sketch (not to scale)



The sketch shows only the main combat arena dimensions. Additional external structures and screens are not shown.

12. Technical inspections and robot handover

12.1 GRA will inform teams separately of exact inspection times, locations and the procedure for submitting photos or videos.

Inspection timeline

14 days before	7 days before	3 days before	Day before
Photos or video	Preliminary inspection	Recheck if required	Final check and sealing

- 12.2** At least 14 days before the competition, each team must submit photos or a video showing the robot's construction process and current condition, together with a short comment on completed and outstanding work.
- 12.3** Seven days before the competition, every team must present its robot for preliminary technical inspection. Photos of teams and robots will also be taken for presentation cards, on-screen graphics and animations.
- 12.4** Teams passing preliminary inspection need attend only the final scheduled inspection on the day before the competition. If the robot fails preliminary inspection, the team must correct the defects and attend reinspection three days before the competition. Failure to attend or pass this inspection results in team disqualification.
- 12.5** On the day before the competition, all preliminarily approved robots undergo final technical inspection, including weighing and safety-function checks. After passing inspection, the robots are sealed, handed over to the organizer and stored in a designated controlled area until the event begins.
- 12.6** Unauthorized opening of a sealed robot, changes to its configuration or removal from storage are prohibited. Necessary servicing or repairs require prior agreement with GRA and may require reinspection and resealing.
- 12.7** At the start of the event, after the seal has been checked, the robot is returned to an authorized team representative. Permitted repairs or battery changes between matches do not cancel the requirement for further weighing and safety checks.
- 12.8** Missing a mandatory inspection, failing final inspection or failing to correct a material defect may result in refusal of admission. Failure to attend or pass reinspection is subject to the disqualification rule in clause 12.4. The team captain will be informed of the decision.

13. Core match rules

- 13.1** Two opposing robots compete in each match. A match lasts three minutes. Robots take their designated starting positions and may move only after the referee's start signal.
- 13.2** If a robot can no longer demonstrate controlled movement, the referee begins a ten-second count. Spinning in place or weapon movement alone does not count as restored mobility. A robot unable to recover movement before the count ends loses the match.
- 13.3** Deliberately gripping, pinning, lifting or otherwise holding an opponent is allowed for a maximum of ten seconds. When instructed by the referee, the robot must release the opponent immediately and allow it to move away.
- 13.4** If robots become unintentionally entangled with each other or the arena, the referee may stop the match. Separation or correction of arena faults is supervised by safety staff. Deliberate entanglement weapons are prohibited.
- 13.5** A team may surrender (Tap Out) at any time. Surrender ends the match immediately, and the opponent is declared the winner. Deliberate attacks after the referee's stop command are prohibited and may result in disqualification.
- 13.6** Dangerous robot damage, leaks, arena defects or loss of control may require a match to be stopped. After safety has been secured, authorized officials decide whether the match can resume and how the result will be determined.
- 13.7** If three minutes pass without a knockout, surrender or other decisive result, the judges determine the winner.

14. Scoring

- 14.1** The current scoring system uses three criteria: functional damage - 5 points, offensive initiative - 3 points and control - 3 points. Three independent judges score each match.
- 14.2** Detailed scoring components and explanations will be provided to all teams on the day before the event. Teams may ask questions about the judging system at the pre-event briefing.
- 14.3** Decisions are made by a majority of the judges' votes. GRA will review procedural or technical matters relating to results under the previously announced procedure.

15. Participant conduct and appeals

- 15.1** Participants must treat opponents, judges, technical staff and spectators with respect. Threats, insults, physical aggression, unauthorized interference with others' equipment, intentional falsification of information and disregard for safety instructions are prohibited.
- 15.2** Depending on the severity of a violation, GRA may require corrections, issue a warning, declare a match loss, temporarily suspend a robot's eligibility or remove a team from the competition. Immediate safety measures may be taken without delay where a direct risk exists.
- 15.3** Within five minutes of the announcement of a result, the team captain may appeal scoring calculation errors, rule application, procedural violations or conflicts of interest. Appeals must be submitted through the communication channel designated by GRA.
- 15.4** Appeals are reviewed by an authorized GRA representative, with an independent specialist if necessary. Simple disagreement with a judge's assessment does not automatically trigger rescoring. The decision and its grounds will be communicated to the relevant teams.
- 15.5** Teams must follow these rules, the officially announced schedule and safety instructions. Technical matters should be agreed in advance through the team captain. GRA will communicate the tournament format, bracket and intervals between matches separately.