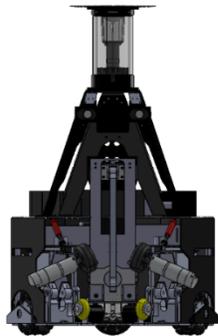
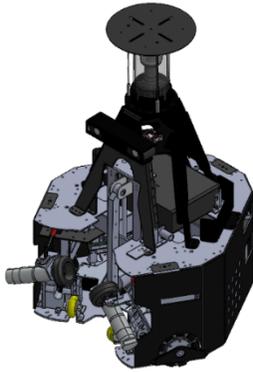


# BARELANG 63 MECHANICAL DESCRIPTION

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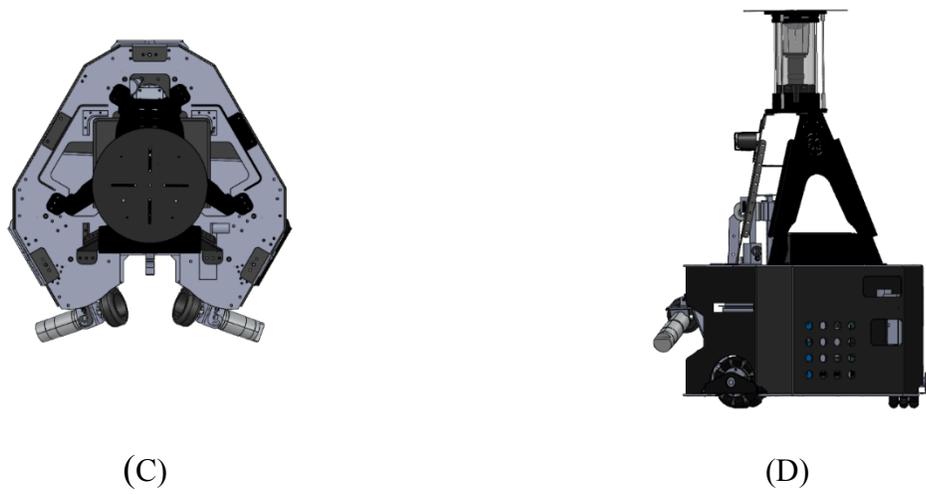
## 1. Full Base Robot Barelang 63

The striker robot employs a three-omnidirectional-wheel configuration for full planar mobility. The robot measures  $51.6 \times 50 \times 76$  cm and is constructed from 6061 aluminum alloy. Locomotion is powered by Maxon RE 40 (150 W) motors with PG45 gearheads, supported by dual 28 mm DC motors for ball handling and a solenoid kicking mechanism. Motion control is based on kinematic modeling in local and global coordinate frames.



(A)

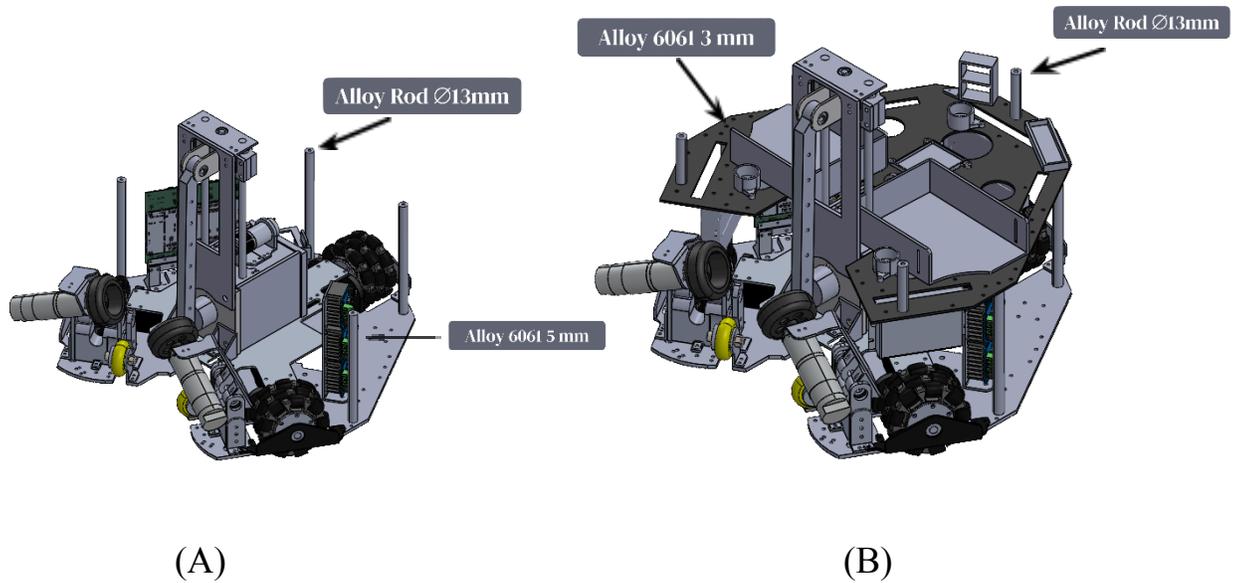
(B)

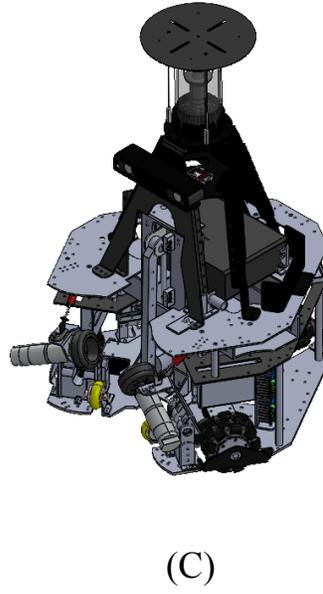


**Fig. 1.** (A) Isometric View (B) Front View (C) Top View (D) Side View

## 2. Robot Frame Structure

The robot frame employs aluminum round bars as vertical load-bearing members. The first-level base uses 5 mm thick 6061 aluminum, while the second and third levels are also constructed from aluminum plates. A 13 mm diameter aluminum rod supports the third-level base to maintain structural integrity.

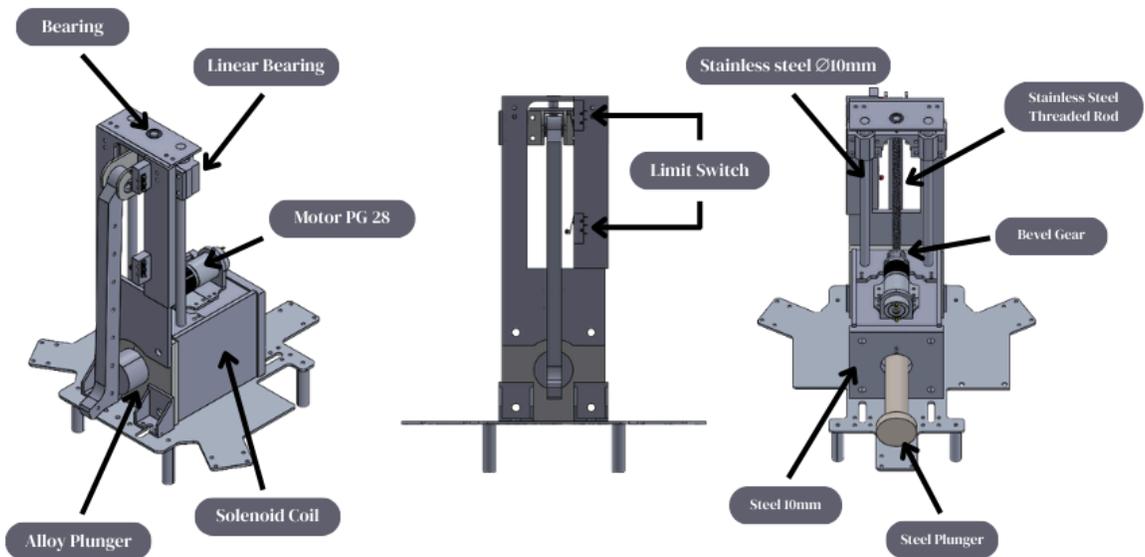




**Fig. 2.** (A) First-Level Base (B) Second-Level Base (C) Third-Level Base

### 3. Kicker Mechanism

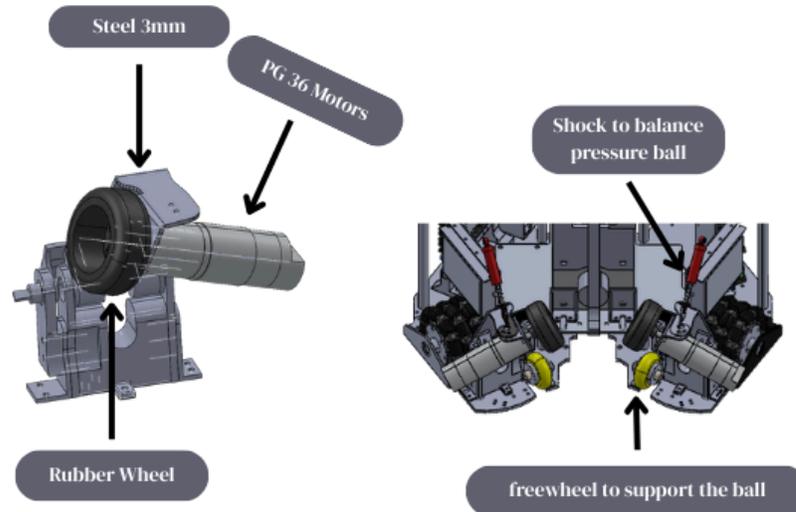
The kicking mechanism employs a custom-designed solenoid system as the primary power source for ball propulsion. To enhance shooting versatility, a mechanical lifter mechanism is integrated, enabling both flat and chip kicks.



**Fig. 4.** Kicker Mechanism Design

#### 4. Dribbler Mechanism

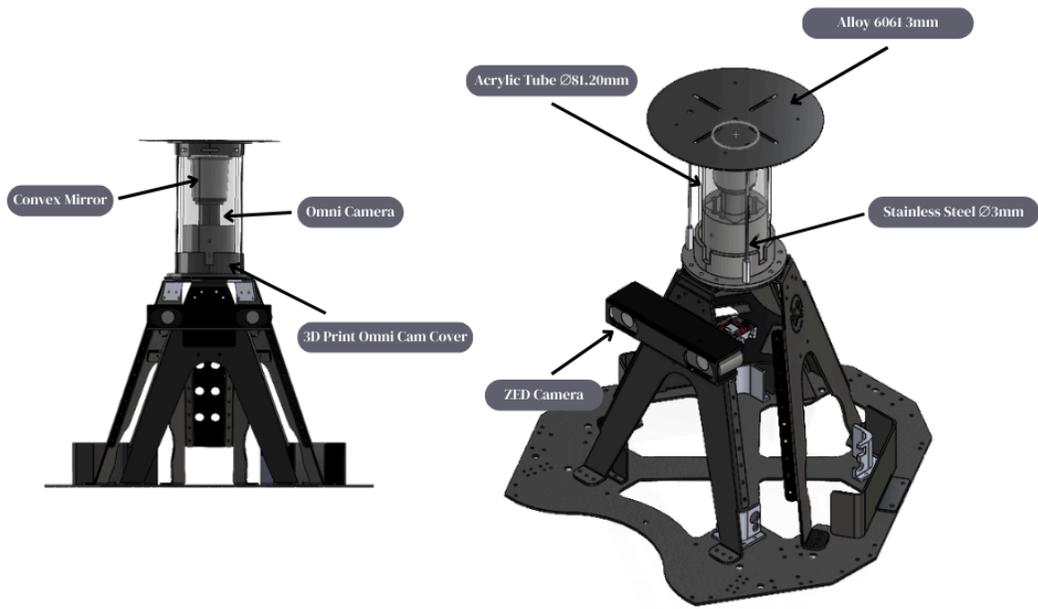
The dribbler employs a PG36 motor-driven roller to capture and control the ball. A freewheel and shock absorber are incorporated to stabilize ball contact and minimize mechanical shock. The design also supports natural dribbling to improve ball retention during high-speed maneuvers.



**Fig. 4.** Dribbler Mechanism Design

#### 5. Vision Chassis Structure

The Barelang63 robot is equipped with two vision systems: an omnidirectional camera for global field perception and a ZED stereo camera for depth-based object detection. The chassis is constructed from a 3 mm thick 6061 aluminum alloy plate that is bent to enhance structural rigidity. The structure is further reinforced by the third-level base, which serves as the primary support point to improve overall mechanical stability.



**Fig. 5.** Vision Frame Structure