POLAR BOT SERIES 3000 TECHNICAL SPECIFICATIONS

Document Version: 2.1

Last Updated: January 11, 2024

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1. OVERVIEW AND SCOPE

1 This Technical Specification Document ("Specification") defines the

2 This Specification is considered proprietary and confidential informa

2. PHYSICAL SPECIFICATIONS

1 Dimensions

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Length: 1250mm   2mm

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Width: 850mm   2mm

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Height: 420mm   2mm

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Ground Clearance: 35mm   1mm

2 Weight

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Base Unit Weight: 185kg   2kg

Maximum Payload Capacity: 1500kg

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Gross Vehicle Weight (GVW): 1685kg

3 Chassis Construction

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Frame: Aircraft-grade aluminum alloy (6061-T6)

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External Panels: Impact-resistant composite with proprietary thermal

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Protection Rating: IP65

3. PERFORMANCE SPECIFICATIONS

1 Environmental Operating Parameters

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Operating Temperature Range: -40 C to +45 C

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Storage Temperature Range: -45 C to +55 C

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Humidity Range: 5% to 95% non-condensing

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Maximum Operating Altitude: 2,000m above sea level

2 Mobility Specifications

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Maximum Speed: 2.0 m/s

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Minimum Speed: 0.1 m/s

Turning Radius: Zero (360 rotation)

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Maximum Slope: 5% at full load

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Floor Surface Requirements: Concrete or epoxy coating with minimun

4. POWER AND ELECTRICAL SYSTEMS

1 Power Source

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Battery Type: Proprietary BlueCore(TM) Cold-Environment Lithium Irc

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Nominal Voltage: 48V DC

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Battery Capacity: 200Ah

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Operating Time: 12 hours under typical load conditions

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Charging Time: 2.5 hours (10% to 90%)

2 Charging System

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Input Voltage: 200-240V AC, 50/60Hz

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Maximum Charging Current: 100A

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Charging Interface: Automated docking or manual plug-in

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Charging Temperature Range: -30 C to +40 C

5. NAVIGATION AND CONTROL SYSTEMS

1 Navigation Hardware

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LiDAR Sensors: 2x 270 scanning units

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3D Cameras: 4x depth-sensing units

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Ultrasonic Sensors: 8x proximity detection units

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IMU: 9-axis inertial measurement unit

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Wheel Encoders: 4x high-resolution optical encoders

2 Control Systems

Main Controller: PDR proprietary cold-environment hardened process

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Processing Speed: 2.5 GHz quad-core

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RAM: 16GB DDR4

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Storage: 256GB industrial-grade SSD

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Operating System: PDR-OS v4.2 (real-time)

6. SAFETY FEATURES

1 Emergency Systems

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Emergency Stop Buttons: 4x physical buttons

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Remote Emergency Stop: Wireless capability

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Safety Light Curtain: Class 2 laser scanning

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Audio Warning System: 95dB at 1m

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Visual Warning System: 360 LED indication system

2 Compliance

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Safety Standards: ISO 3691-4:2020

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EMC Standards: IEC 61000-6-2, IEC 61000-6-4

Wireless Standards: IEEE 802.11ac, Bluetooth 5.0

7. MAINTENANCE AND SERVICE

1 Scheduled Maintenance Intervals

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Level 1 Inspection: Every 500 operating hours

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Level 2 Service: Every 2,000 operating hours

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Battery System Check: Every 1,000 operating hours

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Software Updates: As released by PDR

2 Mean Time Between Failures (MTBF)

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Drive System: 20,000 hours

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Control System: 35,000 hours

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Battery System: 25,000 hours

8. WARRANTY AND DISCLAIMER

1 These specifications are subject to change without notice and repre

2 Actual performance may vary based on specific application, environ

3 All specifications are validated under PDR standard test conditions

9. DOCUMENT CONTROL

Approved By: Dr. James Barrett

Title: Chief Robotics Officer

Date: January 11, 2024

Version History:

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v2.1: Updated environmental specifications and safety compliance sta

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v2.0: Major revision including BlueCore(TM) technology integration

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v1.1: Initial production release