CRYOGENIC COMPONENT DURABILITY TEST RESULTS

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Test Report and Certification Document

Polar Dynamics Robotics, Inc.

Report Date: January 10, 2024

Document Reference: PDR-TR-2024-001

1. EXECUTIVE SUMMARY

This document presents the official test results and certification of cry
durability testing conducted on critical components of the BlueCore(T

autonomous mobile robot platform manufactured by Polar Dynamics I
("Company"). Testing was performed in accordance with ISO 16750-4
Company's proprietary cold-environment testing protocols.

2. TEST SPECIFICATIONS

2.1 Test Environment Parameters

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Temperature Range: +20 C to -40 C

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Humidity Range: 15% to 85% RH

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Test Duration: 2,000 operational hours

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Testing Facility: Company's Advanced Cold Testing Laboratory (Facili

Test Period: July 15, 2023 - December 31, 2023

2.2 Tested Components

- BlueCore(TM) Navigation System (Part #BC-NAV-2023)
- Reinforced Chassis Assembly (Part #RCA-2023)
- Cold-Resistant Power Distribution Module (Part #PDM-CR-23)
- Thermal Management System (Part #TMS-2023)

3. TEST METHODOLOGY

3.1 Testing Protocols

Testing was conducted using Company's proprietary three-phase test methodology:

Static Cold Exposure (500 hours)

Dynamic Operation Testing (1,000 hours)

Thermal Cycling (500 hours)

3.2 Performance Metrics

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Mechanical integrity

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Electronic system stability

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Power efficiency

- Navigation accuracy
- System response time
- Component wear patterns

4. TEST RESULTS

4.1 BlueCore(TM) Navigation System

- Maintained 99.8% accuracy at -40 C
- Zero system failures during 2,000-hour test period
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- Power consumption within specified parameters (2%)

- All sensor arrays maintained calibration

4.2 Reinforced Chassis Assembly

- No structural deformation observed

- Maintained dimensional stability within 0.1mm

- All joining points retained specified torque values

- No evidence of material fatigue or stress fractures

4.3 Power Distribution Module

- Maintained 95% efficiency at -40 C
- Battery performance exceeded specifications by 12%
- No thermal runaway events recorded
- All protection circuits functioned as designed

4.4 Thermal Management System

- Maintained internal operating temperature within 2 C of target
- Heat dissipation efficiency at 98% of rated capacity
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No condensation accumulation observed

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All thermal sensors maintained calibration

5. CERTIFICATION

5.1 Compliance Statement

The tested components meet or exceed all specifications for operation cold environments as defined in Company Standard CS-2023-45 and standards.

5.2 Performance Certification

We hereby certify that all tested components have successfully passe cryogenic durability requirements and are approved for deployment in cold-storage environments with temperatures as low as -40 C.

6. LIMITATIONS AND DISCLAIMERS

6.1 Test Limitations

This certification applies only to the specific components tested and d

extend to:

- Modified or altered components
- Components used outside specified parameters
- Integration with non-approved systems
- Operating conditions beyond stated specifications

6.2 Legal Disclaimer

This document is confidential and proprietary to Polar Dynamics Robo

The information contained herein is provided "AS IS" without warranty

kind, either expressed or implied, including but not limited to the impli

warranties of merchantability and fitness for a particular purpose.

7. AUTHORIZATION

APPROVED AND CERTIFIED BY:

Dr. James Barrett

Chief Robotics Officer

Polar Dynamics Robotics, Inc.

Date: January 10, 2024

Victoria Wells

Chief Financial Officer

Polar Dynamics Robotics, Inc.

Date: January 10, 2024

8. DOCUMENT CONTROL

Document Number: PDR-TR-2024-001

Version: 1.0

Classification: Confidential

Distribution: Authorized Personnel Only

Retention Period: 7 Years

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