TEMPERATURE MONITORING SYSTEM DOCUMENTATION

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Classification: Confidential & Proprietary

1. OVERVIEW AND SCOPE

1. This Temperature Monitoring System Documentation ("Documenta

2. This Documentation applies to all BlueCore(TM)-enabled AMR unit

2. DEFINITIONS

1. "System" means the integrated temperature monitoring apparatus,

2. "Operating Environment" refers to controlled temperature zones ra

3. "Critical Components" includes all temperature-sensitive elements

4. "Monitoring Protocol" means the standardized procedures for temp

3. TECHNICAL SPECIFICATIONS

1. Sensor Configuration

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Primary temperature sensors: Platinum RTD PT100 (0.1 C accuracy)

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Secondary monitoring: Infrared thermal imaging array

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Redundant digital temperature probes at critical points

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Minimum sensor density: 1 per 0.25m² of robot surface area

2. Data Collection Parameters

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Sampling rate: 10Hz nominal

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Data resolution: 16-bit

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Temperature range: -50 C to +85 C

Measurement accuracy: 0.15 C across operating range

4. MONITORING PROTOCOLS

1. Standard Operating Procedures

a) Continuous monitoring of:

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Ambient temperature

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Component surface temperatures

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Internal cavity temperatures

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Power system thermal characteristics

b) Automated response protocols for:

- Thermal anomaly detection
- Critical temperature threshold violations
- System performance degradation

2. Alert Thresholds

- Warning Level 1: 2 C deviation from nominal
- Warning Level 2: 5 C deviation from nominal
- Critical Alert: 8 C deviation or any reading outside operating paramet

5. COMPLIANCE AND CERTIFICATION

1. Regulatory Standards

- ISO 13849-1:2015 Safety of machinery
- IEC 60068-2-1 Environmental testing
- NIST Temperature Measurement Standards
- FDA 21 CFR Part 11 (where applicable)

2. Quality Assurance

- Each System undergoes 72-hour thermal cycling validation

Quarterly calibration of all measurement devices

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Annual third-party certification of monitoring accuracy

6. DATA MANAGEMENT AND REPORTING

1. Storage Requirements

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Primary storage: 30 days rolling temperature data

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Secondary storage: 12 months compressed historical data

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Backup frequency: Real-time mirroring to secure cloud storage

2. Reporting Functions

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Real-time temperature mapping

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Trend analysis and deviation reporting

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Automated compliance documentation

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Performance optimization analytics

7. MAINTENANCE AND CALIBRATION

1. Scheduled Maintenance

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Monthly sensor validation

Quarterly calibration verification

- Semi-annual system optimization

- Annual comprehensive review

2. Documentation Requirements

- Maintenance logs retained for 3 years

- Calibration certificates maintained indefinitely

- Incident reports preserved for 5 years

8. PROPRIETARY RIGHTS AND CONFIDENTIALITY

1. All aspects of the System, including but not limited to design specifi

2. This Documentation is provided under strict confidentiality obligatio

9. REVISION AND CONTROL

1. This Documentation is subject to periodic review and update.

2. All revisions must be approved by the Chief Technology Officer and

EXECUTION

IN WITNESS WHEREOF, the undersigned hereby certifies this Docu

complete and accurate as of the Effective Date.

POLAR DYNAMICS ROBOTICS, INC.

By:

Name: Marcus Chen

Title: Chief Technology Officer

Date: January 11, 2024

By:

Name: Dr. James Barrett

Title: Chief Robotics Officer

Date: January 11, 2024