TEMPERATURE MAPPING STUDY PROTOCOL

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Polar Dynamics Robotics, Inc.

Protocol Number: TMP-2024-001

Effective Date: January 15, 2024

1. PURPOSE AND SCOPE

1 This Temperature Mapping Study Protocol ("Protocol") establishes t

2 This Protocol applies to all temperature mapping validation studies c

2. DEFINITIONS

1 "Temperature Mapping" means the documented measurement of te

2 "Test Environment" refers to the controlled temperature facility wher

3 "Critical Operating Parameters" means the essential performance m

4 "Validation Period" means the minimum 72-hour continuous monitor

3. RESPONSIBILITIES

1 Quality Assurance Department shall:

-

Oversee implementation of this Protocol

Review and approve mapping study results

-

Maintain temperature mapping documentation

-

Issue final validation reports

2 Engineering Department shall:

-

Calibrate all temperature monitoring equipment

-

Position temperature sensors according to mapping grid

-

Monitor data collection systems

-

Analyze 3 raw temperature data

4. EQUIPMENT AND MATERIALS

1 Required Equipment:

-

Calibrated temperature sensors (minimum accuracy 0.5 C)

-

Data logging system with minimum 1-minute recording intervals

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BlueCore(TM) diagnostic interface system

-

Environmental chamber capable of maintaining -40 C

-

Backup power systems

2 Documentation Requirements:

-

Equipment calibration certificates

-

Sensor location diagrams

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Raw data logs

-

Analysis worksheets

-

Deviation reports

5. PROCEDURE

1 Pre-Study Requirements

a) Verify calibration status of all measurement equipment

b) Document initial AMR configuration settings

c) Create detailed sensor placement map

d) Establish baseline environmental conditions

2 Study Execution

a) Position minimum 15 temperature sensors at critical points

b) Initialize data logging system

c) Begin continuous 72-hour monitoring period

d) Record all environmental events and deviations

e) Monitor BlueCore(TM) performance metrics

3 Data Analysis

a) Download complete temperature dataset

b) Calculate mean kinetic temperature

c) Identify temperature extremes and variations

d) Evaluate temperature recovery times

e) Compare results against acceptance criteria

6. ACCEPTANCE CRITERIA

1 Temperature Stability

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Maximum deviation: 2.0 C from setpoint

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Recovery time: 30 minutes after door opening

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Temperature uniformity: 1.5 C across mapping points

2 BlueCore(TM) Performance

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Navigation accuracy: 98% at -40 C

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Power system efficiency: 85% of rated capacity

-

Sensor functionality: 100% operational

7. DOCUMENTATION AND REPORTING

1 Required Documentation

-

Completed temperature mapping protocol

-

Raw data files

Calibration records

-

Deviation reports

-

Analysis worksheets

-

Final validation report

2 Report Contents

-

Executive summary

-

Study methodology

-

Results and data analysis

-

Conclusions and recommendations

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Supporting documentation

8. DEVIATIONS AND CORRECTIVE ACTIONS

1 Any deviation from this Protocol must be documented and approved

2 Corrective actions must be implemented and documented for all dev

9. PROTOCOL APPROVAL

This Temperature Mapping Study Protocol has been reviewed and ap

Quality Assurance Director:

Date: _

Engineering Director: _

Date: _

Chief Technology Officer:

Date: _

10. REVISION HISTORY

Version | Date | Description | Approved By

---|---|---|---

0 | 2024-01-15 | Initial Release | M. Chen

1 | 2024-01-20 | Updated acceptance criteria | E. Frost

End of Document