

ROBOT INSTALLATION REQUIREMENTS - SUB-ZERO ENVIRONMENTS

ROBOT INSTALLATION REQUIREMENTS - S

Polar Dynamics Robotics, Inc.

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1. GENERAL PROVISIONS

1. This document ("Installation Requirements") sets forth the mandator
2. Compliance with these Installation Requirements is mandatory for a

2. DEFINITIONS

1. "BlueCore(TM) System" means PDR's proprietary cold-environment
2. "Installation Zone" means the designated area within the facility wh
3. "Thermal Transition Area" means any space where AMRs must mo

3. FACILITY REQUIREMENTS

1. Temperature Specifications

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Minimum operating temperature: -30 C (-22 F)

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Maximum operating temperature: +45 C (+113 F)

- - 2 -

Maximum temperature variation rate: 15 C per hour

2. Floor Specifications

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Minimum concrete thickness: 15 cm (6 inches)

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Maximum floor slope: 2%

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Surface finish: Steel-troweled, sealed concrete

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Minimum compressive strength: 4,000 PSI

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Maximum gap/joint width: 8 mm (0.31 inches)

3. Charging Station Requirements

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Dedicated 208-240V AC power supply

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Minimum 30A circuit per charging station

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GFCI protection required

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Thermal-insulated mounting brackets

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Minimum clearance: 1.5m (5 feet) on all sides

4. ENVIRONMENTAL CONTROLS

1. Humidity Control

- - 4 -

Maximum relative humidity: 85%

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Minimum relative humidity: 15%

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Condensation prevention systems required

2. Air Movement

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Maximum air velocity: 2.5 m/s

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Minimum clearance from direct air streams: 3m

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Anti-frost ventilation required in charging areas

5. NETWORK INFRASTRUCTURE

1. Wireless Coverage

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Minimum signal strength: -65 dBm throughout Installation Zone

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Dual-band WiFi (2.4 GHz and 5 GHz) required

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Maximum latency: 50ms

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Redundant access points with cold-rated components

2. Network Security

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Dedicated VLAN for AMR operations

- - 6 -

WPA3-Enterprise encryption minimum

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Regular security audit compliance

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Automated failover systems

6. SAFETY SYSTEMS

1. Emergency Systems

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Emergency stop buttons at maximum 15m intervals

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Cold-rated visual warning beacons

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Audio warning systems rated for -40 C

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Thermal-protected emergency power backup

2. Access Control

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Restricted access to AMR operational areas

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Safety training requirements for all personnel

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Biometric access controls rated for sub-zero operation

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Emergency exit compliance with local codes

7. PRE-INSTALLATION VERIFICATION

1. Site Assessment

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Professional engineer certification required

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Thermal mapping of Installation Zone

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Floor load capacity verification

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RF interference testing

2. Documentation Requirements

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Facility floor plans with AMR paths marked

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Electrical system certification

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HVAC system specifications

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Emergency response plan

8. MAINTENANCE ACCESS

1. Service Areas

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Minimum 2.5m x 2.5m maintenance space

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Heated service room within 50m of Installation Zone

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Tool storage at 20 C minimum

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Spare parts storage requirements

9. COMPLIANCE AND LIABILITY

1. These Installation Requirements must be met and maintained throughout the life of the system.
2. PDR reserves the right to update these requirements with 30 days' notice.

10. CERTIFICATION

The undersigned facility representative certifies that all requirements specified herein have been reviewed, understood, and will be implemented as specified.

Facility Representative:

Name: 11 -

Title:

Date:

PDR Representative:

Name:

Title:

Date:

End of Document

