

# POLAR BOT SERIES CE MARKING TECHNICAL FILE

**Document Reference:** PDR-CE-2024-001

**Version:** 3.2

**Last Updated:** January 11, 2024

**Classification:** CONFIDENTIAL

## 1. GENERAL INFORMATION

### 1.1 Manufacturer Details

**Legal Entity:** Polar Dynamics Robotics, Inc.

**Principal Office:** 2500 Innovation Drive, Wilmington, DE 19801

**Manufacturing Facility:** 780 Industrial Parkway, Rochester, NY 14623

**EU Authorized Representative:** RoboTech Compliance GmbH

Hauptstraße 157, 60313 Frankfurt, Germany

### 1.2 Product Identification

**Product Series:** Polar Bot Autonomous Mobile Robot Series

**Models Covered:** PB-2000, PB-2000X, PB-3000, PB-3000X

**Year of CE Marking:** 2024

**Applied Directives:**

- Machinery Directive 2006/42/EC
- EMC Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Radio Equipment Directive 2014/53/EU

## 2. ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

### 2.1 Risk Assessment Summary

The Polar Bot Series has undergone comprehensive risk assessment per EN ISO 12100:2010, addressing:

- Cold environment operational hazards (-40 C to +45 C)
- Autonomous navigation safety systems
- Emergency stop functionality

- Human-robot interaction scenarios
- Battery safety in extreme temperatures
- Electromagnetic compatibility

## **2.2 Safety Integration Principles**

- IceNav(TM) Collision Avoidance System with redundant sensors
- Triple-redundant emergency stop circuits
- Thermal-resistant actuator isolation
- Load stability monitoring system
- Automatic speed adjustment based on environmental conditions

## **3. TECHNICAL SPECIFICATIONS**

### **3.1 Mechanical Specifications**

- Dimensions: 1200mm x 900mm x 450mm (L x W x H)
- Maximum payload: 1500kg
- Operating temperature range: -40 C to +45 C
- IP65 enclosure rating
- Proprietary cold-resistant actuator system (Patent US10,789,456)

### **3.2 Electrical Specifications**

- Power supply: 48V DC
- Battery system: Lithium Iron Phosphate (LiFePO4)
- Charging requirements: 220-240V AC, 16A
- EMC protection class: Class A
- Insulation class: Class I

## **4. COMPLIANCE TESTING AND CERTIFICATION**

### **4.1 Test Reports**

- EMC Testing Report TR-2023-456 (T V S D)
- Safety Testing Report SR-2023-789 (T V S D)
- Cold Environment Performance Report CE-2023-123 (DEKRA)
- Radio Equipment Testing Report RE-2023-234 (Intertek)

## **4.2 Harmonized Standards Applied**

- EN ISO 13849-1:2015 (Safety of machinery)
- EN 61000-6-2:2019 (EMC immunity)
- EN 61000-6-4:2019 (EMC emissions)
- EN 60204-1:2018 (Electrical equipment of machines)
- EN ISO 3691-4:2020 (Industrial trucks)

## **5. TECHNICAL DOCUMENTATION**

### **5.1 Design Documentation**

- System architecture diagrams (Doc. No. PB-ARCH-2024)
- Circuit schematics (Doc. No. PB-ELEC-2024)
- Software architecture specification (Doc. No. PB-SW-2024)
- Mechanical assembly drawings (Doc. No. PB-MECH-2024)

### **5.2 User Documentation**

- Installation Manual (IM-PB-2024-EN)
- Operation Manual (OM-PB-2024-EN)
- Maintenance Manual (MM-PB-2024-EN)
- Emergency Procedures Guide (EP-PB-2024-EN)

## **6. DECLARATION OF CONFORMITY**

The undersigned hereby declares that the Polar Bot Series (Models PB-2000, PB-2000X, PB-3000, PB-3000X) complies with all relevant provisions of the applicable EU directives and harmonized standards listed in Section 1.2 of this technical file.

### **Authorized Signatory:**

Dr. Elena Frost

Chief Executive Officer

Polar Dynamics Robotics, Inc.

Date: January 11, 2024

## **7. DOCUMENT CONTROL**

### **7.1 Revision History**

Version 3.2 - January 11, 2024 - Updated EMC test reports

Version 3.1 - November 15, 2023 - Updated harmonized standards

Version 3.0 - October 1, 2023 - Major revision for PB-3000X model

### **7.2 Distribution Control**

This technical file is maintained electronically in Polar Dynamics Robotics' document management system and physically at the EU Authorized Representative's office. Access is restricted to authorized personnel only.

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