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Title	Wind Turbine Nacelle Inspection Robot
Description	For wind farms in Saudi Arabia and the Middle East where heat, height, and safety risks are critical challenges

🌐 Wind Turbine Nacelle Inspection Robot — One-Pager (English Version)

Industrial Robotics for New Energy · Professional Sales Copy

Wind Turbine Nacelle Inspection Robot

High-Safety · Autonomous Operation · Internal Fault Detection for Wind Turbines

This robotic system is designed specifically for **wind turbine nacelle internal inspection**, reducing the need for manual tower climbing and enhancing the safety and efficiency of wind turbine O&M teams.

With autonomous movement, multi-sensor inspection capabilities, and remote data reporting, the robot is ideal for wind farms in Saudi Arabia and the Middle East where **heat, height, and safety risks** are critical challenges.

CORE HIGHLIGHTS

- **Replaces manual tower-climbing inspection** inside the nacelle
- **Autonomous or remote-controlled movement** along the nacelle interior

- **High-definition imaging system** for component inspection
- **Thermal imaging for early fault detection**
- **Detects lubricating oil leakage, loose bolts, cable damage**
- **Real-time data transmission to cloud / O&M platform**
- Supports **Inspur Cloud AI** for automatic defect classification
- Designed to operate in **complex heat and vibration environments**

APPLICATION SCENARIOS

1. Routine Wind Turbine Nacelle Inspection

- Gearbox
- Generator
- Main shaft
- Brake system
- Electrical wiring

  Value: No human entry required; increases inspection frequency while ensuring safety.

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2. Fault Diagnosis & Predictive Maintenance

- Detect overheating
- Identify component wear
- Alert on abnormal sound or vibration

  Value: Prevents major equipment failures and reduces downtime.

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3. Post-Extreme Weather Inspection

- Sandstorms
- High temperature

- Lightning impact

  Value: Allows rapid inspection after extreme weather without risking personnel.

TECHNICAL SPECIFICATIONS

Item	Specification
Mobility	Autonomous navigation inside nacelle
Imaging	RGB + thermal imaging camera
Detection Items	Oil leakage, loose bolts, cable damage, hotspots
Communication	WiFi / 4G / Beidou (customizable)
Power	Hot-swappable battery
Material	High-strength industrial-grade chassis
Control Method	Remote control + auto-inspection module

> Full customization available for different turbine manufacturers (e.g. Vestas, Goldwind, GE, Siemens Gamesa).

VALUE TO WIND FARMS

- **90% reduction** in dangerous manual nacelle entries
- Enables **daily** or **weekly** inspections rather than monthly
- Standardizes data collection
- Compatible with **Inspur AI O&M system**
- Reduces annual O&M cost and extends turbine lifetime

风机机舱巡检机器人 — 一页纸（中文正式版）

风机机舱巡检机器人

高安全性 · 自动化运行 · 风机核心组件内部巡检

本机器人专为 **风力发电机组机舱内部巡检**而设计，解决传统人工爬塔风险高、效率低、数据不统一的问题。

机器人可在机舱内部自主行走，采集可见光与热成像数据，实时上传至云端，实现 **智能巡检 + 故障预警**。

核心亮点

- **替代人工爬塔进入机舱巡检**
- **自主行走 / 远程控制双模式**
- **高清摄像头**用于部件状态记录
- **红外热成像识别早期故障**
- 检测项目包括：**漏油、螺栓松动、电缆损伤、温度异常**
- 数据实时回传至 O&M 平台
- 可对接 **浪潮 AI 平台**自动识别缺陷
- 适应风机内部高温、强震动等复杂环境

典型应用场景

1. 风机例行巡检

- 齿轮箱
- 发电机
- 主轴
- 刹车系统
- 电缆与端子
- *价值：**无需人工进入机舱，大幅提升巡检频率与安全性。

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2. 故障诊断与预测性维护

- 热点检测

- 异常磨损
- 振动与噪音预警
- *价值：**提前发现隐患，减少停机损失。

3. 极端天气后的快速巡检

- 风沙
- 高温
- 雷击后检查
- *价值：**避免人员冒险，快速恢复发电能力评估。

技术参数

项目	参数
移动方式	机舱内部自主导航
成像系统	可见光 + 红外热成像
可检测内容	漏油、螺丝松动、电缆磨损、温度异常
通信方式	WiFi / 4G / 北斗（可定制）
电源	可热插拔电池
机体结构	工业级合金结构
控制方式	远程操控 + 自动巡检任务

为风电场带来的价值

- 将人工爬塔减少 **90%**
- 巡检频率从“每月一次”提升到“每日或每周”
- 标准化巡检数据，便于 AI 分析
- 可与浪潮平台联动生成巡检报告
- 降低 O&M 成本，延长风机寿命