



**Zoomlion Heavy Industry N.A., Inc.**

## **Power Controls Engineer**

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**Department:** Engineering

**FLSA Status:** Exempt

**Grade/Level:** Mid-career

**Job Type:** Regular

**Work Schedule:**

Weekdays Monday through Friday unless traveling.

Hours flexible to meet project needs.

**Job Status:** Full Time

**Reports To:** Eng. Manager - Control Systems

**Amount of Travel Required:** Up to 10%

**Positions Supervised:** None

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### **POSITION SUMMARY**

Research, define, and develop a variety of power module solutions for applications that electrify off-highway, industrial, agricultural, and heavy equipment construction machinery. Develop requirements and design specifications, participate in design reviews, evaluate proposed designs by rapid prototyping, modeling, and testing. Apply principles and techniques of electrical power engineering design processes and best practices. Work closely with other engineers and collaborate with other engineering disciplines to successfully complete projects on time and on budget.

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### **ESSENTIAL FUNCTIONS**

#### **Reasonable Accommodations Statement**

To accomplish this job successfully, an individual must be able to perform, with or without reasonable accommodation, each essential function satisfactorily. Reasonable accommodations may be made to help enable qualified individuals with disabilities to perform the essential functions.

#### **Essential Functions Statement(s)**

- Understand power delivery systems including:
  - Variable frequency drives (VFDs)
  - How VFDs functions in various applications
  - The technologies internal to the drives including gate drive circuitries and IGBTs
  - How new technologies are enabling MOSFETs to be used in place of IGBTs
  - The use of capacitor buses and how electric vehicle battery systems may replace them
  - Thermal issues and challenges with cooling
  - Drive sizing considerations
  - Types of motors used, their applications, and their benefits and drawbacks
- A knowledge of different power sources and how that affects system performance
- Understanding of different battery technologies and the benefits and challenges of each
- A good understanding of drive control schemes utilized
- Experience with off-road heavy machinery is a plus
- Working knowledge of hydraulics is also a plus

## **POSITION QUALIFICATIONS**

### **Competency Statement(s)**

- Accountability - Ability to accept responsibility and account for actions
- Communication, Oral - Ability to communicate effectively with others using the spoken word
- Communication, Written - Ability to communicate in writing clearly and concisely
- Creative - Ability to think in such a way as to produce a new concept or idea
- Problem Solving - Ability to find a solution for or to deal proactively with work-related problems
- Technical Aptitude - Ability to comprehend complex technical topics and specialized information
- Initiative - Ability to make decisions or take actions to solve a problem or reach a goal
- Detail Oriented - Ability to pay attention to the minute details of a project or task
- Analytical Skills - Ability to use thinking and reasoning to solve a problem
- Judgment - The ability to formulate a sound decision using the available information
- Conceptual Thinking - Ability to think in terms of abstract ideas
- Research Skills - Ability to conduct a systematic, objective, and critical investigation
- Decision Making - Ability to make critical decisions while following company procedures
- Organized – Managing time effectively and following a systematic method of performing a variety of tasks
- Self-Motivated - Ability to be internally inspired to perform a task to the best of one's ability using own drive or initiative
- Systems Analysis - Ability to determine how a system should work and how changes in conditions, operations, and the environment will affect outcomes
- Technical Aptitude - Ability to comprehend complex technical topics and specialized information

## **SKILLS & ABILITIES**

**Education:** Bachelor's degree (four-year university or tech school) required.  
Required field of study: Electrical, Power Engineering, or related

**Experience:** Mid-career – Minimum of 5 years experience  
Under the supervision of engineering managers and team leads:

- Develops power control system designs for heavy machinery
- Evaluates different power conversion strategies
- Understands different power sources and battery systems
- Has working experience with Matlab/Simulink/Simscape
- Able to use lab equipment in the execution of tests

**Computer Skills:** Microsoft Office 360:  

- Outlook, Word, Excel, PowerPoint, Visio, and SharePoint

  
Able to use various software tools used for defining, modeling, building, and testing power structures

**Certifications & Licenses:** None required.

- Other Requirements:**
- A good understanding of product design using a defined development process
  - Basic knowledge of all phases of the development life cycle: requirements, design, implementation, reviews, testing, and release
  - Familiar modeling a power system and validating on a HIL
  - Able to run tests using DAQ systems, analyze data gathered, and improve designs

**PHYSICAL DEMANDS**

- N (Not Applicable)** Activity is not applicable to this position.  
**O (Occasionally)** Position requires this activity up to 33% of the time (0 - 2.5+ hrs/day)  
**F (Frequently)** Position requires this activity from 33% - 66% of the time (2.5 - 5.5+ hrs/day)  
**C (Constantly)** Position requires this activity more than 66% of the time (5.5+ hrs/day)

**Physical Demands**

Stand	F	<b>Lift/Carry</b>	
Walk	F	10 lbs or less	O
Sit	F	11-20 lbs	O
Manually manipulate	F	21-50 lbs	O
Reach outward	O	51-100 lbs	N
Reach above shoulder	O	Over 100 lbs	N
Climb	N	Push/Pull	
Crawl	N	12 lbs or less	O
Squat or kneel	N	13-25 lbs	O
Bend	O	26-40 lbs	N
Grasp	O	41-100 lbs	N
Speak	F		

**Other Physical Requirements**

**WORK ENVIRONMENT**

Office or lab environments with a controlled indoor atmosphere, outside field testing

Prepared by: Deb Lauenstein, HR Director Date: 1/7/2022

Approval  
Signature:  Guy A. Moore, Engineering Manager Date: 1/7/2022

The company has reviewed this job description to ensure that essential functions and basic duties have been included. It is intended to provide guidelines for job expectations and the employee's ability to perform the position described. It is not intended to be construed as an exhaustive list of all functions, responsibilities, skills and abilities. Additional functions and requirements may be assigned by supervisors as deemed appropriate. This document does not represent a contract of employment, and the company reserves the right to change this job description and/or assign tasks for the employee to perform, as the company may deem appropriate.