**Conclusion**

**Key Considerations:**

1. **Precision:** High microstepping capability for smooth and precise movements.
2. **Torque:** Sufficient current handling to drive motors that can handle the load and arm length.
3. **Closed-Loop Control:** Feedback mechanisms for accuracy and to avoid missed steps, crucial for industrial applications.
4. **Reliability:** Robust protection features to ensure long-term reliability and performance.

**Best Options for Industrial Robotic Arm:**

1. **Leadshine DM542**
   * **Control Type:** Closed-loop
   * **Voltage Range:** 20V to 50V
   * **Current:** Up to 4.2A
   * **Microstepping:** Up to 1/256
   * **Features:** Anti-Resonance, built-in protection, precise control with feedback.
   * **Application:** Suitable for industrial applications requiring high precision and reliability.
2. **M542T**
   * **Control Type:** Closed-loop
   * **Voltage Range:** 20V to 50V
   * **Current:** Up to 4.2A
   * **Microstepping:** Up to 1/256
   * **Features:** Over-current, over-voltage, and short-circuit protection, precise motor control.
   * **Application:** Ideal for robotics and CNC machines.
3. **EMD542**
   * **Control Type:** Closed-loop
   * **Voltage Range:** 24V to 50V
   * **Current:** Up to 4.2A
   * **Microstepping:** Up to 1/128
   * **Features:** Built-in microstepping, over-current and over-temperature protection.
   * **Application:** Suitable for precise and reliable industrial control.
4. **TMC5062**
   * **Control Type:** Hybrid (with sensorless feedback features)
   * **Voltage Range:** 4.75V to 20V
   * **Current:** Up to 1.1A RMS per motor
   * **Microstepping:** Up to 1/256
   * **Features:** Dual motor control, StallGuard2, CoolStep, SpreadCycle.
   * **Application:** Ideal for robotics, offering some closed-loop functionalities without full feedback systems.
5. **L6470**
   * **Control Type:** Hybrid (with advanced control features)
   * **Voltage Range:** 8V to 45V
   * **Current:** Up to 3A
   * **Microstepping:** Up to 1/128
   * **Features:** Programmable acceleration, deceleration, speed, and current.
   * **Application:** Suitable for precise control in industrial applications.

**Summary:**

For your industrial robotic arm, **Leadshine DM542**, **M542T**, and **EMD542** are the best options due to their closed-loop control capabilities, high current handling, and high microstepping precision. These drivers offer the reliability and accuracy needed for an industrial robotic arm to perform smooth, precise movements and handle the specified load efficiently.

But in the case of open loop TMC motor driver like **TMC5062, TMC2209** & **TMC2208** will be the best option.

[ There is a dedicated file where we try to compare among best TMC driver only.]