

# 6 Essentials to Cover When Purchasing a Robot for Automation

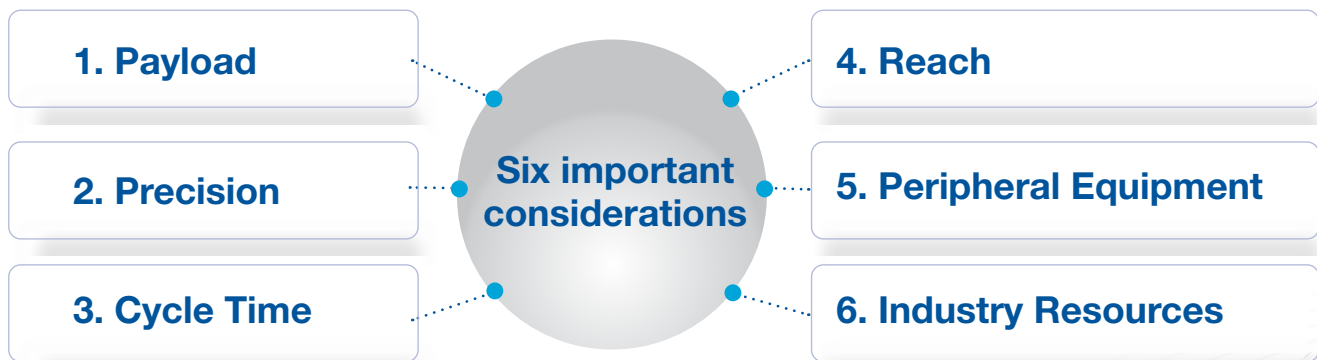


The age of robot automation is well underway.

Many enterprises are embracing automation solutions for their power, speed, precision, safety, and productivity as a way to improve operational processes. With today's robotic technology, manufacturers are able to develop customized solutions to automate both complex applications such as precision small parts assembly as well as more routine applications like product packaging, material handling and dispensing.

If you've been considering implementing robots into your operations, you've likely already identified a number of processes that could benefit from the technology. But where do you start? What considerations around your existing processes need to be made prior to implementing robots? Which features should you look for in a robot for maximum efficiency?

Below, we offer six important considerations when transitioning to robot automation. If you are in doubt about any step, be sure to reach out to experts such as manufacturers, system integrators, or tool builders for assistance.



## 1 Payload

**Payload refers to the amount of weight a robot arm can accommodate and is one of the most important considerations for a robotic solution.** It's a common misconception to just think of payload as the part you are picking up. Therefore, when calculating the payload required for a given application, always make sure to verify both the part weight as well as the weight of any associated tooling such as grippers, cables, pneumatic devices, etc. Knowing this will help you calculate the correct payload amount.

As you evaluate various robotic solutions, ensure your decisions are based on your specific process, your specific payload requirements, and the maximum payload of the robot. Too light of a payload on a given robot can result in application damage or even failure. Too heavy a payload can slow down processes and subsequent cycle times, creating inefficiencies and decreasing productivity. Sometimes it is a good idea to move up to a larger robot when your payload requirements get close to a robot's maximum specified payload.

## 2 Precision

**Precision refers to the robot's ability to bring its end effector to the same position again and again.** When selecting a robot for your current operational processes, you must determine what level of precision is required to successfully assemble your parts.

To determine your precision requirement, we recommend you identify the tightest fit for the parts in your process and add a buffer. Keep in mind that tolerance build-up from part variations, a part's feeding method, tooling, and cabling can all impact your precision calculation.

## 3 Cycle Time

**Reducing cycle times is a major driving factor when automating a manual process.** To ensure you are able to shorten this time, make sure to conduct a careful evaluation of your current process and associated cycle times. Start with the big picture and then break down what is required by each step of your manufacturing process. Determine how many parts you need every week or month. From there, you can start breaking that down to how many parts per week, per day, and per hour.

Once you're at this point, work with your internal team, system integrator, or builder on translating your requirements into automation needs. This step will help to determine how many robots you might need, what the cycle time requirements are for each robot, what end of arm tooling is required, and what the layout should be.

It's also helpful as part of this step to run a simulation or feasibility study of your application. It's common to look at a robot's specification page and just buy the fastest robot. Keep in mind that robot specifications utilize a standardized "Champion Cycle" which is very different from your "real-world" application and associated cycle time. Running a simulation will help you find the right robot for your environment.

## 4 Reach

**The reach of a robot refers to the distance from the robot's center to the fullest extension of the robotic arm.** Knowing this measurement determines the robot's work envelope and provides guidance as to what might work for a given project requirement.

Consider your current application process. What is the longest range of motion required? How much space do you need for the workcell process? For example, if the range of motion in the workcell is minimal, select a robot with a shorter reach to maximize efficiency and productivity. Also, make sure to consider where the robot will be mounted and find a robot that meets this requirement.



## 5 Peripheral Equipment

**Peripheral equipment refers to additional components required for your process.** This could include items such as parts feeding equipment (bowl feeders, flexible feeders, etc.), vision systems, end-of-arm tooling (EOAT) like grippers or tool changers, conveyors, force sensing, safety equipment, or the robot base.

Before you get to peripheral equipment, always make sure to identify the core requirements for your process. This ensures that you select the peripheral equipment that supports the application, rather than the other way around.



## 6 Industry Resources

**Automation is a constantly changing field. Fortunately, the industry is filled with experts who have likely come across an application just like yours.** Make sure to utilize these experts when designing and building your application. This includes entities such as robot manufacturers, distributors, system integrators, or other industry experts. These individuals have a wealth of experience and can offer not only best practices and guidance but also consultative support such as proof of concepts and feasibility studies. Consider their advice prior to purchasing a solution.

You may also have in-house resources that you can utilize to help you make a decision. Regardless of which source you choose, take time to see what others are saying about each key element prior to making an investment decision.

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