

Picking the right motor for your application: Stepper Motors, DC Motors & EC/BLDC

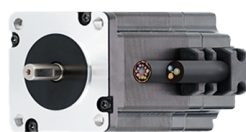
When picking a motor for your application, you want to be sure that you are getting one that will provide you with the right specs, but you also would like to maintain the most cost-effective option. So how can you select the right motor? Some questions and thoughts to consider before picking the motor. What motor type do you need? How much load will the motor be moving? How fast does the motor need to go? Will this be mounted vertically or horizontally? Linear or rotary? All of these questions are necessary to consider in order to get your application to run as smooth as possible.



Stepper Motor



DC Motor

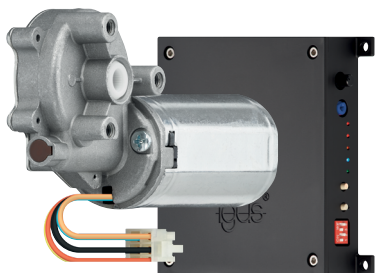


EC/BLDC

The different types of motors

There are three different types of motors: Stepper, DC, and BLDC. There are a few different characteristics between these three types of motors but the main thing that separates them is their operation. A stepper motor will provide you with fairly smooth operation and precise control as it has 200 steps or tics that it will make in a revolution. A DC motor is the slowest of the bunch, but they provide you with the most torque and also torque control. A brushless DC (BLDC) or EC motor will provide you with high speeds/accelerations and a constant torque which is better equipped for vertical applications. Stepper motors will provide you with the most precision and control over your motor.

	Lifetime	Price	Voltages
Stepper	up to 20,000 hours	\$60-1,300 (the most amount of options to choose from)	24-48V
DC	up to 3,000 hours	\$60-200	24V
BLDC	up to 20,000 hours	\$150-500	48V



DC and the D3

A DC motor paired with our D3 motor driver will give you control of how much torque is to be applied before the driver and motor error out. This can be very useful for certain applications where too much force may damage the system or production they are apart of.



D1 motor controller and GUI

Motor drivers

With these motors, you will also need some type of controller, or driver, in order to operate them. There are a few options when it comes to motor controllers: AC, DC, servo, stepper, brushless, and others. Iigus offers a few different types of drivers, the first of them being the D1. This controller offers compatibility with stepper, DC, and BLDC (EC) motors, with also offering the ability to use custom motors by inputting custom specifications. There is a GUI (graphical user interface) that allows for easy modifications and

automation of your motor, it is simple to use and is accessed offline via ethernet connection. It has CANopen and modbus TCP as a gateway for communication if needed to be used with a PLC or master controller. There is also the ability of choosing open vs closed loop for smoother operation, essentially turning a stepper motor into a servo.



D3 motor controller

We also offer the D3, an even more cost-effective solution that is specifically for DC motors. This driver has dip switches, a couple push buttons, and two potentiometer, all for simple control of a DC motor. The dip switches allow for mode selection, and the potentiometers control velocity and force.

The next 3 controllers are all similar, it just depends on the motor size. The D7 (nema 11/17), D8 (nema 23/24(23XL), and the D9 (nema 34) are the simplistic drivers for stepper motors. These also use dip switches for various mode control as well as microstepping and RPM selection. These drivers are a great solution for someone who is using a PLC such as a raspberry pi or Siemens device and need to control multiple motors at once.



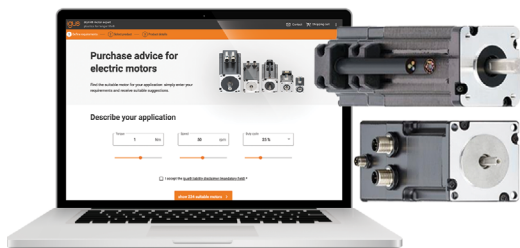
D7, D8 & D9 motor controllers

igus® Robot Control software

In the past couple of years, we have also been greatly improving our own version of a master controller or PLC, we call it the iRC (Iigus Robot Control). This controller allows for control of multiple stepper motors at once, up to 9. It also has the capability of interfacing with our Rebel robotic arm, which utilizes BLDC motors using CANopen. The iRC has the options for a 48V power supply, in a cabinet on a DIN rail, with an emergency stop button. All models come with modules for the motors, as well as one module with 7 inputs and 7 outputs, and a main embedded computer as the master. The iRC software is very easy to use, with a digital twin for a user-friendly interface, and programming in a simple format, plotting each point by typing in the coordinates. The programming also has loops, if then statements, and matrix functions to simplify the amount of steps needed in the program. It also has options for getting feedback from the digital IOs (such as using a push button (input) or activating a gripper (output)). There is the ability of connecting a vision system and utilizing commands from it via variable functions. This control connects via ethernet, but has the ability of projecting a wifi signal as an access point for wireless connection. This is our recommended controller for all gantries, deltas, and articulated arms.

drylin® motor expert

Our team of experts is available to help at any time, but you can also head over to our drylin® motor expert and enter information regarding the required torque, speed, and the duty cycle. With over 200 motors, our expert system filters through and selects the most suitable motor that will benefit you for your application, showing you various options such as



motor size, connection type, the percentage for the workload required from the motor with your specs in it, as well as the voltage that the motor would be operating at with these calculations. All of these options can be sorted and organized from least to greatest. You will also see its gear ratio (whether it has one or not), whether it contains encoder, hall sensor, or brake, and the cost of the motor. This tool is an efficient way of going through our available motors providing you with the best option, without having to scroll through pages of motors or read through different technical datasheets until you find the rights specs.

You are always welcome to browse and choose your own motors, but if you need any assistance at all in making the right choice or to better calculate your specs, feel free to contact us at any time! We have people working to help make sure that your application is performing to its best standards and in order for that to happen, we need to make sure you have the right components first. These controllers paired with any of the mentioned motors make for a great combination to create a smooth and powerful system that is easy to set up and use.