

Drop-In Replacement Electric Motors

Drop-in replacement is a dream. With the right knowledge and experience it can be done.

You've got an electric motor that has gone down and it just isn't economically smart to try to get it repaired again. You've come to the conclusion that you need a replacement, and you would be so happy if you could just get a drop-in replacement. The good news is that the idea of a perfect drop-in replacement isn't a fairy tale -- it can be challenging and take some work on the part of both your staff and **the source you purchase your electric motors from**, but it can be done. Here are the facts you need when you start shopping for a drop-in replacement electric motor.

What Is a Drop-In Replacement?

For an electric motor to qualify as a drop-in replacement, it must be such an extremely close match to your original motor that all you need to do is "drop it in" and it will operate just like the original without requiring any special measures to get it to fit, no rerouting of power leads, and no worries about whether it provides the right amount of torque and horsepower. And as you have probably already guessed, finding a drop-in replacement can be challenging -- especially if your electric motor is no longer supported by the original manufacturer.

What Happens with the Wrong Motor

If you fail to find a correct drop-in replacement, then you run the risk not only of the motor not fitting in the right place but issues interfacing it with the main and auxiliary connection boxes, inability to drive the usual load, and similar issues. You can't afford to not find the right motor the first time, either in terms of downtime or money. However, rest assured: drop-in replacements do exist!

Who Is Responsible for Finding the Right Motor?

If you are looking for a drop-in replacement motor, who is responsible for making sure it is the right motor: you or the electric motor supplier? Well, the truth is that it has to be a shared responsibility. You cannot hope for an electric motor shop or motor supplier to find the perfect replacement for you unless you provide them with the right information or, better yet, access to your system for them to find that information.

First Source of Information: Electric Motor's Nameplate

The first item of information that you need when you start looking for a drop-in replacement motor is the **metal nameplate** on the existing motor. The nameplate, which is required on all electric motors, contains at a minimum some very key information that will help you out:

- Manufacturer
- Model/catalog number
- Serial number (which can help if your motor might still be under warranty)
- Horsepower and speed (in rpm)
- Voltage (this has to match for the motor to function correctly and not burn out)
- Frequency (60Hz in the US, 50HZ for European countries)
- **Frame Size** (This could mean nothin but it also could be a regulated IEC or NEMA frame size, which is determined by a combination of horsepower, speed, and the type of enclosure used, and includes a shocking amount of information)
- **Enclosure** (the most common examples are ODF (open drip proof) and TEFC (totally enclosed fan cooled, but there are many others)

Additional information that can be found on a nameplate, including power factor, service factor, insulation class, temperature rise, and KVA code. This type of information is also invaluable when it comes to tracking down the right replacement motor.

Now, you might be thinking, “Hey! manufacturer and model number! That’s all I need!” Well, that isn’t all you need unless the manufacturer still makes that exact same model. You might want to look for a replacement motor that provides **better efficiency** or is more suited to the task. And sometimes it is wise to have a different kind of enclosure on the replacement motor.

Other Considerations in Finding a Replacement

Here are some of the key considerations involved with **finding a drop-in replacement**:

- Location of the main connection box and the auxiliary connecting boxes
- Physical/space constraints for the replacement motor
- Load information
- Speed vs. torque curve for the motor (if possible)
- An accurate drawing of the original motor (if possible)
- History of any issues with the unit

Once that information is in hand, these questions typically follow:

- Do the critical mounting dimensions match a common modern frame size?
- Is there anything special about the motor?
- Can we adapt a common motor versus a custom one?
- Does a custom electric motor make more sense?
- What manufacturer(s) build the best solution?

This type of information requires that you work closely with the electric motor shop and provide them with all the information you have about the motor in question.

Options for Drop-In Replacements

In some cases, you can find a COTS (Catalog Off The Shelf) replacement motor that will work with no modifications or adaptation necessary. If that proves to be impossible, then a COTS motor could be adapted for use or a custom electric motor could be built to exactly match the specifications and constraints of your system.

You may also want to **consider a surplus motor** - not always a perfect fit replacement (sometimes they are!) and can, many times, be very close to the original. If you have an older vintage frame motor, a surplus may actually fit better than a new motor! Even if they are not perfect, you can get out of a bind with a surplus motor!

HECO Can Help You Find the Perfect Drop-in Replacement

At HECO, we love a good challenge and finding the perfect drop-in replacement for a customer is something that we excel at. We use a proven process that includes an on-site assessment to gather all the information we can about the motor you need. And if it turns out that you need a motor to be adapted or you need a custom-built solution, we can help you with that, too. We can also make suggestions for a redesign your existing motor to provide better efficiency. No matter how challenging it may be to find you a drop-in replacement...we will do it.