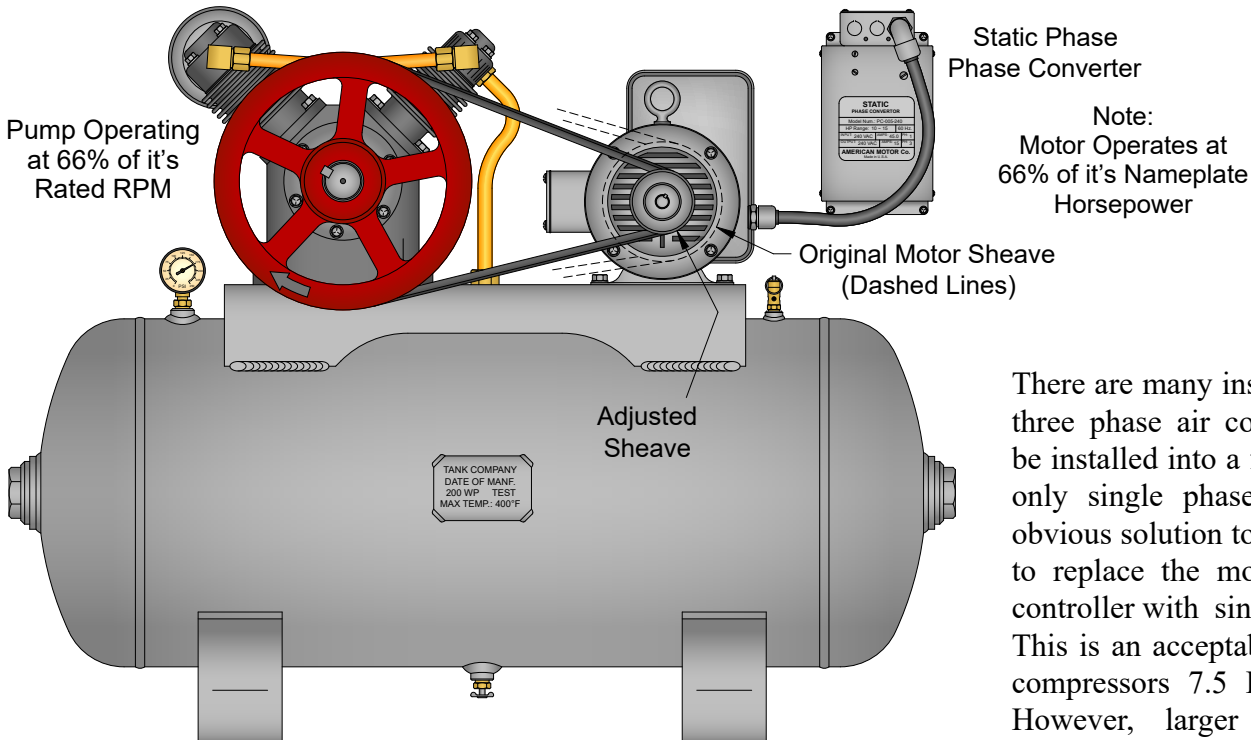


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## Operating a 3 Phase Air Compressor On Single Phase Power by Brian S. Elliott



There are many instances where a three phase air compressor must be installed into a facility that has only single phase power. The obvious solution to the problem is to replace the motor and motor controller with single phase units. This is an acceptable solution for compressors 7.5 HP or smaller. However, larger single phase motors are not readily available

and when they are, they are prohibitively expensive. For most professionals, the next go-to solution is a 3 phase converter. A rotary phase converter can be used, but they too are prohibitively expensive. A static phase converter can represent an economical solution to this situation, that is, if the compressor is set up properly. One must be aware that a three phase motor operating from a static phase converter will generally produce only two thirds (2/3) of the nameplate horsepower. If an improperly prepared air compressor is operated from a static phase converter, the motor will repeatedly overheat, resulting in a shortened life expectancy and/or, in some cases, completely burning up.

To operate the compressor on a static phase converter, it must be de-rated by approximately 30%. This is done by adjusting the drive ratio between the motor and pump. The motor is equipped with a smaller pulley and shorter v-belt. The pulley size is selected so that the pump is operated at approximately 60% of its rated RPM. This will have the effect of reducing the overall output of the compressor. As an example, a 10 HP compressor equipped as discussed above will produce 6 HP of compressed air. This may seem like an unacceptable loss, but one must keep in mind that air compressors are rarely operated at their peak output. Knowing this, it's obvious that the loss of compressor capacity will have very little, if any, impact on the application.

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