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## **ADVANTAGES OF USING LOW VOLTAGE AC DRIVES WITH INPUT AND OUTPUT ISOLATION TRANSFORMERS VS. MEDIUM VOLTAGE AC DRIVES**

Motors rated 200 HP and above are often wound for medium voltage (2300VAC or 4160 VAC) instead of low voltage (480 VAC to 600 VAC). Above 1000 HP it is difficult to find motors that are not wound for medium voltage. There are many reasons why you should consider the use of a low voltage AC drive with an input and output isolation transformer instead of a medium voltage AC drive.

### **First Cost:**

Even if you own an existing motor wound for 2300 VAC or 4160 VAC, your first cost to install a low voltage AC drive with an input and output isolation transformer will typically be lower than your first cost to install a medium voltage AC drive. If your input voltage is 2300 VAC or 4160 VAC, you are going to need an isolation transformer. Medium voltage AC drive suppliers always require an isolation transformer to protect the AC motor from high voltage transients. The cost of a 4160 VAC to 480 VAC step down input isolation transformer is no more expensive than the cost of a 4160 VAC to 4160 VAC input isolation transformer.

Medium voltage AC drives are not inexpensive. The cost of a typical low voltage AC drive and an output (step-up) isolation transformer is typically only 50% to 75% of the cost of a medium voltage AC drive. Why you might ask? First of all, semiconductor technology still favors higher current at a lower voltage over lower current at a higher voltage. Second, there are relatively few medium voltage AC drives manufactured. The manufacturing process for a medium voltage AC drive still involves a good deal of custom engineering and manufacturing. Low voltage AC drives (even 1000 HP low voltage drives) are more of a production line product. Third, there are just more suppliers of low voltage AC drives. The competition is more intense and the prices are more competitive.

### **Size:**

The physical size of a medium voltage AC drive and input isolation transformer is typically 125% to 150% larger than the size of a typical low voltage AC drive with input and output Isolation transformers. Medium voltage AC drives are often constructed in their own walk in enclosures.

### **Service and Repair:**

Plant Maintenance generally has a healthy fear of medium voltage applications. They are usually quite comfortable with medium voltage transformers and medium voltage motors. They are less comfortable with medium voltage switchgear and medium voltage AC motor starters. Medium voltage AC drives are very complex products, much more complex than a medium voltage AC motor starter. Most plant maintenance engineers are not comfortable with medium voltage AC drives. Medium voltage AC drives are almost always installed, started up, repaired and maintained by the manufacturer's field service engineer. This can become very expensive and it leaves you at the mercy of the manufacturer. A low voltage AC drive with input and output Isolation transformers is a product that your maintenance staff will feel comfortable with.