



BOOSTER®
DIGITAL ROTARY CONVERTERS

Correct Sizing Of Digital Rotary Phase Converters.

When to overload 60Hz Boosters™. USA and Canada only.

What size of digital rotary converter do I need?

Minimum: The internal idler motor must be as large as the largest motor that you want to start. For example if you have a lathe with a 20hp motor, you will need a rotary converter with a 20hp idler motor. Ideally you should add all loads you will run simultaneously to determine the Booster's output.

With a 20hp rotary converter, what is the maximum Hp that I can run?

This depends on the type of equipment you want to power and on the power quality you want. Other manufacturers of rotary converters claim that you can overload a converter by the factor of three. This is not different with our Booster™ converters. But we want you to understand the implications this might have:

• Protection

You cannot protect a 20hp converter with electric overload protection when your load is 60hp.

• Phase Voltage Balance

A 20hp Booster™ converter type T or F will balance the phase voltages at all loads up to 100%. Phase voltage balance beyond 100% motor load is still better than with other rotary converters, but electronic balancing stops at 100%. Phase voltage unbalance increases with increasing load. If you aim for good power quality without the need for de-rating your motor or machine power: choose a Booster™ the size of your real power demand.

• Motor Loads

Standard motors running at less than 70% capacity will lend to the generating effect of the idler motor. Caution - It is difficult to determine exactly what percentage of shaft load a motor has at any given time.

• Resistive Loads

Resistive load consists of machines that use elements such as ovens. Welders, plasma cutters, CNCs, and motors with adjustable speed frequency drives are also considered

resistive. Many resistive type loads, especially computerized equipment, are sensitive to voltage imbalance between the three incoming power lines to the machine. Resistive type loads will not help to generate as inductive motor loads therefore phase converter sizing for these loads is very critical. If resistive load is more than one third of your total load: choose a Booster™ the size of your real load.

Asymmetrical Voltages with Rotary Phase Converters in general

Traditional non-digital rotary phase converters only offer symmetrical voltages at one specific load. For example a 5hp rotary phase may only produce true symmetrical voltages at 3 hp load. Outside this load the voltage symmetry is lost.

Motor de-rating when voltages are not balanced

Because of the asymmetrical voltages (voltage imbalance), machines and motors need to be de-rated by 10 - 20% of their actual name plate horsepower ratings. In contrast to traditional rotary phase converters, the BOOSTER™ T and F controller maintain the phase voltage balance from 0-100%.

Summary –Facts –Risks

Fact:

Purchasing a BOOSTER™ digital rotary phase converter with the internal idler motor matching the total combined horsepower load will give you the best possible power quality. Machines will not trip out or be underpowered because of asymmetrical voltages. Use the unique twin motor Booster™ for reduced inrush currents.

Fact:

Overloading a BOOSTER™ digital rotary phase converter will work.
But please understand:

- (1) All or most of your loads must be motors. Not heaters – not variable speed drives – not welders – not plasma cutters – not CNC machines.
- (2) None of your machinery should be voltage sensitive (electronics).
- (3) Your machines will operate with up to 80-85% horsepower rating only.
- (4) You are confident that the average load of your machines does not exceed 70%.

Risk:

Machines may trip out, or be underpowered because of asymmetrical voltages. If you use the resistive load alone this load must not exceed the size of the internal motor.

If in doubt, please consult Martin's Electrical Service LLC phone (570) 668-4540 and speak with a phase converter application specialist for assistance in choosing the best Booster™ Phase converter for your specific application.