TRAK MACHINE TOOLS

SOUTHWESTERN INDUSTRIES, INC.

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White Paper

Q: My customer has single-phase power; what type of phase converter should he use?

A: There are 3 kinds of phase converters. The following is an explanation of each:

Static Phase Converter – Creates 3 phase power only during start up of the motor. The motor then runs on single-phase power. The power of the motor is then de-rated to ½ to 2/3 of its normal capacity. This type of converter is **NOT** to be used on any of our equipment.

Rotary Phase Converter – This device creates the 3rd leg of power continuously during the operation of the motor. This type of phase converter is **not** recommended on our machine models that have 3 phase electronics that control our spindle and axis motors. The problem with these types of converters is the voltage does not get regulated very well and can vary enough to cause problems with the electronics. Some of these also do not regulate the 120° angle between the 3 phase lines. Some manufacturers also recommended doubling the size of the rotary phase converter to ensure that the converter has enough power to run the machine or motor at start up. For example, it can depend whether the motor you are powering is easy, medium, or hard to start and that drives the size of the phase converter.

CNC Rotary Phase Converter – This device also creates the 3rd leg of power continuously during the operation of the motor. This type of phase converter **is** recommended for our machine models that have 3 phase electronics that control our spindle and axis motors. This type of converter will regulate the voltage and phase angle closely, within 10% is typical. They also eliminate the high voltage of the 3rd leg, which is typical. Some of these converters come with an isolation transformer built in to regulate the voltage, such as the Roto-Load converters from Ronk. These types of converters are typically 2 times to 5 times as expensive as regular rotary converters. The latest technology in this area includes rotary phase converters that are digitally controlled to help regulate the voltage very closely.

Nameplate Ratings

The following are the nameplate ratings found on each of our machines. This information will be needed by the phase converter manufacturer. (FLA – full load amps)

Approximate Phase Converter Sizes

The following table also lists the recommended size of phase converters for our machines. Having said this, phase converters should **not** be quoted directly from SWI. We should ultimately tell the customer to contact their local phase converter manufacturer for the final sizing requirements. The numbers below will tell the customer the approximate size that will be needed.

Machine Type	FLA of Largest Motor at 208V	FLA of Machine at 208v	KVA	Phase Converter Size Recommended Range KVA
Non-Spindle Control DPMSX2, K2SX, K3SX	8.5	8.5	3.1	~5-7
Non-Spindle Control K4SX, DPMSX3 & 5	14	14	5.1	~7-10
DPMV5	17.5	36.5	13.2	~20-25
1540V	33	47	16.9	~25-30
DPME2	11	11	4.0	~5-7
DPMV7	33	52	18.7	~25-30
1440EX	14	14	5.5	~5-7
1630SX	25	25	9.0	~15-20
1840SX	33	36	13.0	~20-25
2460V	45	59	21.25	~30-35
Spindle Control DPMSX2, K2SX, K3SX	11	11	4.0	~5-7
Spindle Control DPMSX3, DPMSX5, K4SX	17.5	17.5	6.3	~7-10
1540SX	33	33	11.9	~20-25
2460SX	45	45	16.2	~25-30
FHM5	17.5	17.5	6.3	~7-10
FHM7	37.5	37.5	13.5	~20-25
LPM	27.7	78	28.1	~30-35
1845SX	30	33	11.9	~20-25
2470SX	40.4	53	19.1	~25-30
2OP M10	8.7	18	6.5	~7-10
2OP M11 6k / 10k	9.5	26	9.4	~15-20
DPMRX2	8.5	27	9.8	~15-20
DPMRX3, DPMRX5	14	35	12.6	~20-25
DPMRX7	21	42	15.2	~20-25
1630RX, HS-RX	20	44	15.58	~20-25
1845RX	30	54	19.5	~25-30
2470RX	40.5	73	27	~30-35
TMC5, 7, 10	27.7	68	24.5	~30-35
VMC2	9.8	27.4	9.9	~15-20

Note: KVA = (FLA x Volts x $\sqrt{3}$)/1000
1 Horsepower = 0.746 KVA or Kilowatt