



Southwestern Industries, Inc.

White Paper

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Step Down Transformers

When the shop power is 415, 440, 460 or 480 volts, a Step Down Transformer is needed to supply 220-volt power for the following TRAK models:

SX Series Lathes

SX Series Mills that have the Programmable Spindle Control (PSC) Option

V Series Lathes

V Series Mills

DPM E2 Mill

Note: machines that do not have the spindle speed controlled by the ProtoTRAK can be wired for 220 or 440 volts by changing the motor wiring and fusing.

The transformer should step the voltage down between 208 and 240 volts, with 220 being the best voltage. Values above and below this range may cause problems with the CNC. Problems can take the form of CNC faults or shut downs, blown fuses or even burned components if the power fluctuation is large. If the voltage produced by the transformer is near one of the extremes in this range, small fluctuations in voltage may send the voltage outside of the range.

The following tables provide:

- Full Load Amps (FLA) of the spindle motor
- FLA of the machine – what the machine will draw with all the motors working at maximum capacity.
- KVA value for each machine at 220 volts

Machines with the Flange/Transformer Option (FTO) have an extra transformer that steps the 220V power from the spindle down to 110V before it enters the pendant. This affects the overall machine FLA and KVA.

Current TRAK models:

TRAK Model	FLA of spindle motor at 220V	FLA of machine (all motors) at 220V	KVA rating
DPMSX2, K2SX, K3SX with PSC	11	11	4.5

DPMSX3, DPMSX5, K4SX with PSC	17.5	17.5	7
1630SX	25	25	9.5
1630SX w/ FTO	25	29.5	11
1630HS-SX	25	25	9.5
1630HS-SX w/FTO	25	29.5	11
1845SX	33	33	13
1845SX w/ FTO	33	39	15
2460SX	45	45	17
2460SX w/ FTO	45	49.5	19
FHM7	37.5	37.5	14
FHM7 w/ FTO	37.5	45	17

Legacy TRAK models:

TRAK Model	FLA of spindle motor at 220V	FLA of machine (all motors) at 220V	KVA rating
DPMV5	17.5	36.5	14
1540V	33	47	18
DPME2	11	11	4.5
DPMV7	33	52	20
2460V	45	59	22.5
1540SX	33	33	12.5
1540SX w/ FTO	33	37.5	14
1840SX	33	35	13
1840SX w/ FTO	33	39.5	15
FHM5	17.5	17.5	7
FHM5 w/ FTO	17.5	25	9.5

The formula used to calculate KVA is:

$$KVA = \frac{(\text{Volts})(FLA_{\text{machine}})(\sqrt{3})}{1000}$$

In order for the Step Down Transformer supplier to determine the proper sizing, he or she will need:

- Primary Voltage – the voltage available in the shop
- Secondary Voltage – the voltage required by the TRAK machine: 208V – 240V with 220V being optimal
- KVA – from the above tables