

TRANSFORMERS SELECTION GUIDE

Selection of Proper VA rating of Transformer:

In order to choose the appropriate transformer, you must first identify three characteristics of the load circuit: the total steady-state (sealed) VA, the total inrush VA, and the inrush load power factor.

1. The total steady-state (sealed) VA refers to the volt-amperes that the transformer needs to supply to the load circuit continuously. This represents the amount of current required to maintain the contact within the circuit. (Calculate by adding the total steady-state VA of all devices in your control circuit.)
2. Total inrush VA represents the volt-amperes that the transformer is required to supply when the control circuit is initially powered on. This value is determined by summing the inrush VA of all components that are energized at startup. Additionally, it is important to include the VA of components which do not have inrush VA, such as indicating lights, lamps, timers, etc, since they also impose a load on the transformer during peak inrush.
3. The total inrush VA can be computed using the following formula:

$$\text{Total Inrush VA} = \sqrt{(VA \text{ sealed})^2 + (VA \text{ inrush})^2}$$

4. To determine the appropriate VA rating, consult the Regulation Data Table. If the nominal supply voltage exhibits a fluctuation of no more than 5%, reference the 90% secondary voltage column. For supply voltage variations up to 10%, utilize the 95% secondary voltage column. The 85% secondary voltage column provides minimum values necessary for correct electromagnetic device operation and should be employed solely as a reference.
5. Using the provided regulation data table, select a transformer with a continuous VA rating that meets or exceeds the value calculated in Step 1, and with a maximum inrush VA rating that matches or surpasses the value determined in Step 3.

SERIES CPT VOLTAGE REGULATION TABLE

CONTINUOUS VA TRANSFORMER NAMEPLATE	INRUSH VA @ 40% POWER FACTOR		
	85% SECONDARY VOLTAGE	90% SECONDARY VOLTAGE	95% SECONDARY VOLTAGE
50	177	139	102
100	350	275	203
150	715	554	400
250	1653	1264	895
350	2604	1947	1321
500	4004	3023	2090
750	6933	5088	3352
1000	10087	7340	4764
1500	14178	10232	6508
2000	17604	12669	8080
3000	39213	27539	16780
5000	68344	47498	28803

Note: It is advisable to select a control transformer with a power factor of 40%. Many circuit components, particularly electromagnetic devices, exhibit inherently low power factors approximating this value. By choosing a transformer with a 40% power factor, sufficient capacity is ensured to accommodate the diverse load characteristics within the circuit.