

# Primary Fuses For LV Control Transformers

Control circuit transformers used as part of a motor control circuit are to be protected as outlined in Tables 1 & 2 (p. P14) with one important exception. Primary fuses may be sized up to 500% of transformer rated primary current if the rated primary current is less than 2 amperes.

When a control circuit transformer is energized, the typical magnetizing inrush will be 25-40 times rated primary full load current (FLA) for the first 1/2 cycle and dissipates to rated current in a few cycles. Fuses must be sized so they do not open during this inrush. We recommend that fuses be selected to withstand 40 x FLA for .01 sec. and to stay within the NEC guidelines specified above.

For example: 300VA Transformer, 600 V primary.

$$I_{pri} = \frac{\text{Transformer VA}}{\text{Primary V}} = \frac{300}{600} = 1/2A = \text{FLA}$$

The fuse time-current curve must lie to the right of the point 40 x (1/2A) = 20A @ .01 sec.

Secondary fuses are still sized at 125% of the secondary FLA.

## Recommended Primary Fuses for Single Phase Control Transformers

Trans VA	600 Volt Primary						480 Volt Primary					
	FLA	ATQR	ATMR	A6D-R+	AJT+	TRS-R	FLA	ATQR	ATMR	A6D-R+	AJT+	TRS-R
25	.042	1/10	2/10	2/10	-	1/10	.052	1/10	1/4	1/4	-	1/10
50	.083	1/4	3/10*	4/10	-	2/10	.104	1/4	1/2*	1/2	-	2/10
75	.125	1/4	1/2*	6/10	-	2/10	.156	3/10	3/4*	6/10	-	2/10
100	.167	3/10	3/4*	8/10	-	3/10	.208	4/10	1	1	1	3/10
130	.22	4/10	1	1	1	4/10	.27	1/2	1	1	1-1/2	4/10
150	.25	1/2	1*	1-1/4	1	4/10	.313	1/2	1-1/2	1-4/10	1-1/2	4/10
200	.33	1/2	1-1/2	1-6/10	1-1/2	6/10	.417	6/10	2	2	2	6/10
250	.42	6/10	2	2	2	6/10	.52	8/10	2	2-1/2	2-1/2	6/10
300	.50	1	2	2-1/2	2	8/10	.62	1-1/2	3	3	3	8/10
350	.583	1-1/4	2	2-8/10	2	1	.73	1-1/2	3-1/2	3-1/2	3-1/2	1
500	.833	1-1/2	4	4	4	1-1/4	1.04	2	5	4	4	1-4/10
750	1.25	2-1/2	6	4	4	1-6/10	1.56	3*	7	5	5	2
1000	1.67	3	8	5	5	2-1/4	2.08	4+	-	5+	5+	3
1500	2.5	5+	-	6+	6+	4	3.125	7+	-	6-1/4+	6-1/4+	4
2000	3.33	8+	-	8+	8+	5	4.17	10+	-	7+	7+	5
3000	5.00	12+	-	12+	12+*	8	6.25	15+*	-	15+*	15+	8
5000	8.33	20+*	-	20+*	20+**	12+	10.4	-	-	25+*	25+*	15+
7500	12.5	30+*	-	30+*	30+**	17-1/2+	15.6	-	-	35+**	35+**	20+
10000	16.7	-	-	40+*	40+**	25+	20.8	-	-	50+**	50+**	30+
Trans VA	240 Volt Primary						120 Volt Primary					
	FLA	ATQR	ATMR	A6D-R+	AJT+	TRS-R	FLA	ATQR	ATMR	A6D-R+	AJT+	TRS-R
25	.104	2/10	1/2	1/2	-	2/10	.21	4/10	1	1	1	3/10
50	.21	4/10	1	1	1	3/10	.42	6/10	2	2	2	6/10
75	.31	1/2	1-1/2	1-4/10	1-1/2	4/10	.6	1	3	3	3	8/10
100	.42	6/10	2	2	2	6/10	.83	1-1/2	4	4	4	1
130	.54	1	2-1/2	2-1/2	2-1/2	8/10	1.08	2-1/2	5	4	4	1-6/10
150	.625	1	3	3	3	8/10	1.25	2-1/2	6	4	4	1-6/10
200	.83	1-1/2	4	3-1/2	3-1/2	1	1.67	3*	8	5	5	2-1/4
250	1.04	2	5	4	4	1-4/10	2.08	4+	-	5+	5+	2-8/10
300	1.25	2-1/2	6	4	4	1-6/10	2.5	5+	-	6+	6+	3-2/10
350	1.46	3*	7	5	5	2	2.92	7+	-	6+	6+	4
500	2.08	4+	-	5+	5+	2-8/10	4.17	10+	-	10+	6	5-6/10
750	3.13	7+	-	6-1/4+	6-1/4+	4	6.25	15+*	-	15+**	15+	8
1000	4.2	10+	-	7	7	5-6/10	8.33	20+*	-	20+**	20+*	12+
1500	6.25	15+	-	15+	15+	8	12.5	30+*	-	30+	30+	15
2000	8.3	20+*	-	20+**	20+**	12	16.7	-	-	40+**	40+	25+
3000	12.5	30+*	-	30+**	30+**	15	25	-	-	60+**	60+*	35+
5000	20.8	-	-	50+**	50+*	25	41.7	-	-	100+**	100+**	60+
7500	31.3	-	-	70+**	70+**	40+	62.5	-	-	150+**	150+**	90+
10000	41.7	-	-	100+**	100+**	60+	83.3	-	-	200+**	200+**	125+

The above fuses will withstand 40 x FLA for .01 second except where noted.

+ Secondary fusing required.

\* Fuse will withstand 30 x FLA for .01 second.

\*\* Fuse will withstand 35 x FLA for .01 second.