

Transformer Coupled RF Induction Loads

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INTRODUCTION

In almost all RF Induction heating applications, it seems that arcing or shorting on the secondary is common. This is not a major problem using an SCR Power Control that is fused and equipped with an Overcurrent Trip circuit. However, in many of these applications the engineer designing the equipment uses power controllers without line fuses to help prevent nuisance fuse blowing. There is one disadvantage with this practice, the SCR Power Control must be oversized to handle the surge currents resulting from the short circuits. The intent of this Application Note is to provide help in selecting an HDR power control without fuses based on line voltage, transformer impedance and load kilowatts.

CAUTION

AMETEK HDR Power Systems recommends the use of line fuses on all SCR Power Controls. However, use this information to help prevent damaging the SCR if operating without fuses. The user must provide adequate overcurrent protection.

SELECTION CRITERIA

To properly select the correctly sized non-fused SCR Power Control you must have the following information: the AC input voltage; the transformer impedance and the required load kilowatts.

Refer to the table on page 2 for Single-phase systems and page 3 for Three-phase systems. The information is grouped according to the standard current ratings of AMETEK HDR Power Controls. Locate the current rating column and then find the current rating of the SCR Power Control you intend on using. Next go to the right on the same line as the voltage rating and find the column with the transformer impedance. Listed is the load kilowatt rating for that particular sized unit. Also included for your reference is the normal kilowatt rating of the power control if fused.

SINGLE PHASE LOAD KILOWATTS

NON - FUSED KILOWATT RATINGS TRANSFORMER IMPEDANCE						
1PH Voltage	Current Rating	4%	5%	6%	7%	Fused
600	60	33	35	35	35	35
480	60	26	28	28	28	28
400	60	22	24	24	24	24
240	60	13	14	14	14	14
120	60	6	8	8	8	8
600	90	49	54	54	54	54
480	90	39	43	43	43	43
400	90	32	35	35	35	35
240	90	20	21	21	21	21
120	90	9	10	10	10	10
600	120	49	61	72	72	72
480	120	39	49	57	57	57
400	120	32	40	47	47	47
240	120	20	24	28	28	28
120	120	9	12	14	14	14
600	180	98	107	107	107	107
480	180	78	86	86	86	86
400	180	65	72	72	72	72
240	180	39	43	43	43	43
120	180	19	21	21	21	21
600	225	105	131	135	135	135
480	225	84	105	107	107	107
400	225	69	87	90	90	90
240	225	42	52	54	54	54
120	225	21	26	27	27	27
600	350	117	146	172	210	210
480	350	93	117	137	168	168
400	350	77	97	114	139	139
240	350	46	58	68	83	83
120	350	23	29	34	42	42
600	500	165	206	243	295	300
480	500	132	165	194	236	240
400	500	110	137	162	196	200
240	500	65	82	96	117	120
120	500	33	41	48	59	60
600	650	299	374	389	389	389
480	650	239	299	311	311	311
400	650	199	250	259	259	259
240	650	119	149	155	155	155
120	650	60	75	78	78	78
600	800	299	374	441	479	479
480	800	239	299	352	383	383
400	800	199	250	293	319	319
240	800	119	149	176	192	192
120	800	60	75	78	96	96
600	1000	575	599	599	599	599
480	1000	460	479	479	479	479
400	1000	383	400	400	400	400
240	1000	230	240	240	240	240
120	1000	115	120	120	120	120
600	1200	575	719	719	719	719
480	1200	460	576	576	576	576
400	1200	383	479	479	479	479
240	1200	230	288	288	288	288
120	1200	115	144	144	144	144

THREE PHASE LOAD KILOWATTS

3PH Voltage	Current Rating	NON - FUSED KILOWATT RATINGS TRANSFORMER IMPEDANCE				
		4%	5%	6%	7%	Fused
600	60	58	62	62	62	62
480	60	46	50	50	50	50
400	60	38	42	42	42	42
240	60	23	25	25	25	25
208	60	20	22	22	22	22
600	90	85	94	94	94	94
480	90	68	75	75	75	75
400	90	57	62	62	62	62
240	90	35	37	37	37	37
208	90	30	32	32	32	32
600	120	85	106	125	125	125
480	120	68	85	100	100	100
400	120	57	71	83	83	83
240	120	35	42	50	50	50
208	120	30	37	43	43	43
600	180	170	187	187	187	187
480	180	136	150	150	150	150
400	180	113	125	125	125	125
240	180	68	75	75	75	75
208	180	59	65	65	65	65
600	225	182	228	234	234	234
480	225	146	182	187	187	187
400	225	121	152	156	156	156
240	225	73	91	94	94	94
208	225	63	79	81	81	81
600	350	203	254	299	364	364
480	350	162	203	239	291	291
400	350	135	169	199	242	242
240	350	81	101	119	145	145
208	350	70	88	103	126	126
600	500	286	358	421	512	520
480	500	229	286	337	409	416
400	500	191	239	281	341	346
240	500	114	143	168	204	208
208	500	99	124	146	177	180
600	650	519	649	675	675	675
480	650	415	519	540	540	540
400	650	346	433	450	450	450
240	650	207	259	270	270	270
208	650	180	225	234	234	234
600	800	519	649	764	831	831
480	800	415	519	611	665	665
400	800	346	433	509	554	554
240	800	207	259	305	333	333
208	800	180	225	264	288	288
600	1000	997	1039	1039	1039	1039
480	1000	798	831	831	831	831
400	1000	665	693	693	693	693
240	1000	399	416	416	416	416
208	1000	345	360	360	360	360
600	1200	997	1247	1247	1247	1247
480	1200	798	998	998	998	998
400	1200	665	831	831	831	831
240	1200	399	499	499	499	499
208	1200	345	432	432	432	432