

# Heater Fuse Sizing Tables

This document is a reference guide for heater load fuse sizing for Shift Controls ISPA and IFPA series temperature control panels. In the following pages, find the model of panel you are selecting fuses for, determine either your heater full load current (top x-axis) or full load power (bottom x-axes). Next, determine the correct size of fuse for your application, by finding which fuse size box intersects on the y-axis. If your heater is between fuse sizes, it is typically better to use the larger size.

Never exceed the maximum allowable fuse size for your control panel. Always use correctly sized fuses, rated for the speed and voltage of the application. Reference the control panel's wiring diagram for more information on recommended fuse sizes for your control panel.

				<b>Manufacturer Equivalent Fuse</b>		
<b>Fuse Description</b>	<b>Fuse Type</b>	<b>Speed</b>	<b>Voltage</b>	<b>Edison</b>	<b>Bussmann</b>	<b>Littlefuse</b>
<b>ISPA Series Fuses</b>						
Supplementary, Control Circuit (F2)	5x20 mm 1 Amp	Fast-Acting	250VAC	GMA	GMA	235
Main Power Branch Fusing (F1)	Class CC 1-20 Amp	Fast-Acting	600VAC	HCLR	KTK-R	KLKR
<b>IFPA Series Fuses</b>						
Supplementary, Control Circuit	5x20 mm 1 Amp	Fast-Acting	250VAC	GMA	GMA	235
Control Transformer, Primary (480VAC models)	Midget Class 1 Amp	Time-Delay	500VAC	MEQ	FNQ	FLQ
Control Transformer, Secondary (480VAC models)	Midget Class 1 Amp	Fast-Acting	250VAC	MOL	BAF/BAN	BLF
Main Power Branch Fusing	Class J Amp Varies	High Speed	600VAC	JHL	DFJ	N/A

Note that IFPA Series control panels use class J, current limiting branch fuses, which come in different dimensions. Class J fuses of 1-30 Amp, 35-60A, and 70-100A are 3 different physical sizes. A fuse reducer is required if, for example, you are using a 60A fuse in a 100A holder.

			<b>Power Circuit Fuse Size</b>		
			<b>1 - 30A Fuse</b>	<b>35 - 60A Fuse</b>	<b>70 - 100A Fuse</b>
<b>Shift Controls Model</b>	<b>Fuse Disconnect Holder Size</b>	<b>Max Fuse Size</b>	<b>Fuse Reducer Model Required</b>		
ISPA-120-1P-15A	30A, Class CC	20A	None Required	N/A	N/A
IFPA-xxx-3P-24A	30A, Class J	30A	None Required	N/A	N/A
IFPA-xxx-1P-35A	60A, Class J	45A	Littlefuse LRUJ63	None Required	N/A
IFPA-xxx-3P-64A	100A, Class J	80A	N/A	Littlefuse LRUJ16	None Required

Note: -xxx- in Model represents the control panel voltage



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# Heater Fuse Sizing Tables

Figure 1 Main Branch Fusing Diagram (ISPA-120-1P-15A)

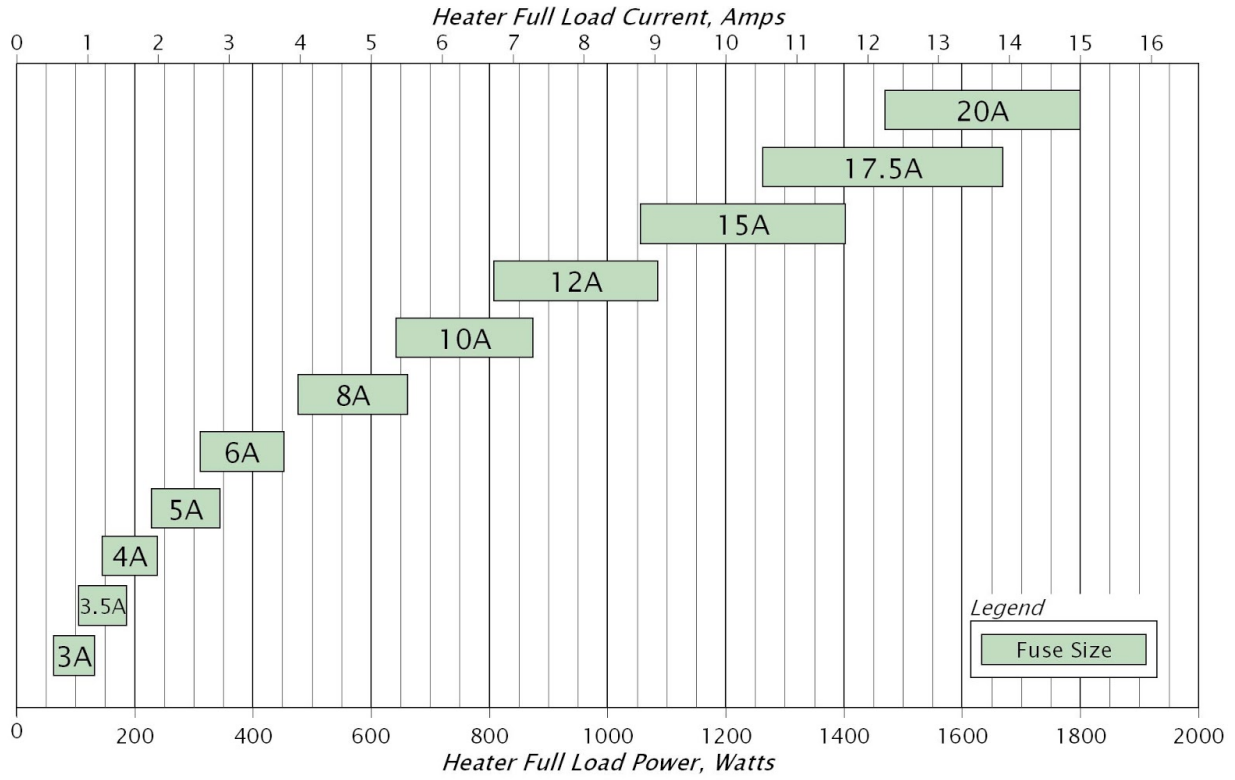


Table 1 Main Branch Fusing Table (ISPA-120-1P-15A)

		Fuse Size												
		2A	2.5A	3A	3.5A	4A	5A	6A	8A	10A	12A	15A	17.5A	20A
Power, Watts	Min	150	188	225	263	300	375	450	600	750	900	1125	1313	1500
	Max	192	240	288	336	384	480	576	768	960	1152	1440	1680	1800
FLA, Amps	Min	1.25	1.56	1.88	2.19	2.50	3.13	3.75	5.00	6.25	7.50	9.38	10.94	12.50
	Max	1.60	2.00	2.40	2.80	3.20	4.00	4.80	6.40	8.00	9.60	12.0	14.0	15.0



# Heater Fuse Sizing Tables

Figure 2 Main Branch Fusing Diagram (IFPA-120-1P-35A)

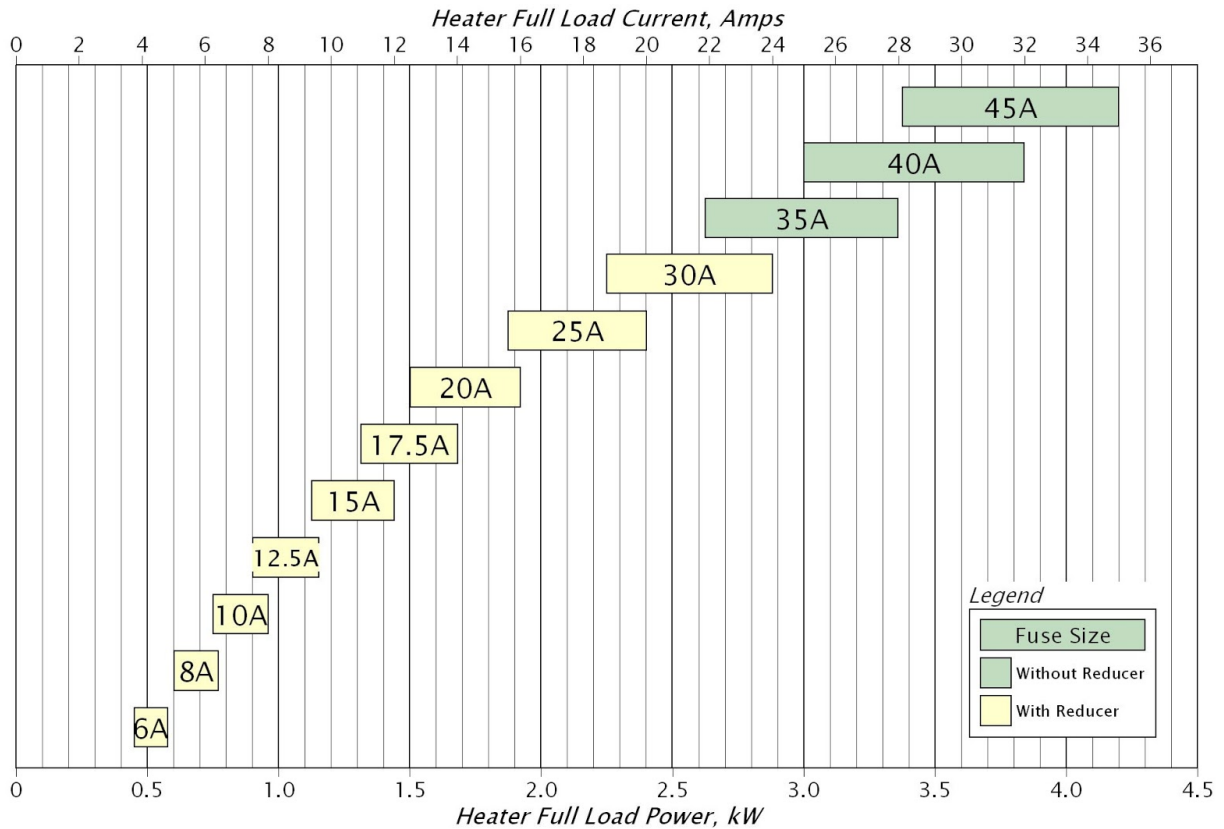


Table 2 Main Branch Fusing Table (IFPA-120-1P-35A)

		Fuse Size												
		Littlefuse® LRJ63 Fuse Reducers Required for 1-30A Fuses										No Fuse Reducers		
		5A	6A	8A	10A	12A	15A	17.5A	20A	25A	30A	35A	40A	45A
Power, kW	Min	0.38	0.45	0.60	0.75	0.90	1.13	1.31	1.50	1.88	2.25	2.63	3.00	3.38
	Max	0.48	0.58	0.77	0.96	1.15	1.44	1.68	1.92	2.40	2.88	3.36	3.84	4.20
FLA, Amps	Min	3.13	3.75	5.00	6.25	7.50	9.38	10.9	12.5	15.6	18.8	21.9	25.0	28.1
	Max	4.00	4.80	6.40	8.00	9.60	12.0	14.0	16.0	20.0	24.0	28.0	32.0	35.0



# Heater Fuse Sizing Tables

Figure 3 Main Branch Fusing Diagram (IFPA-208-1P-35A)

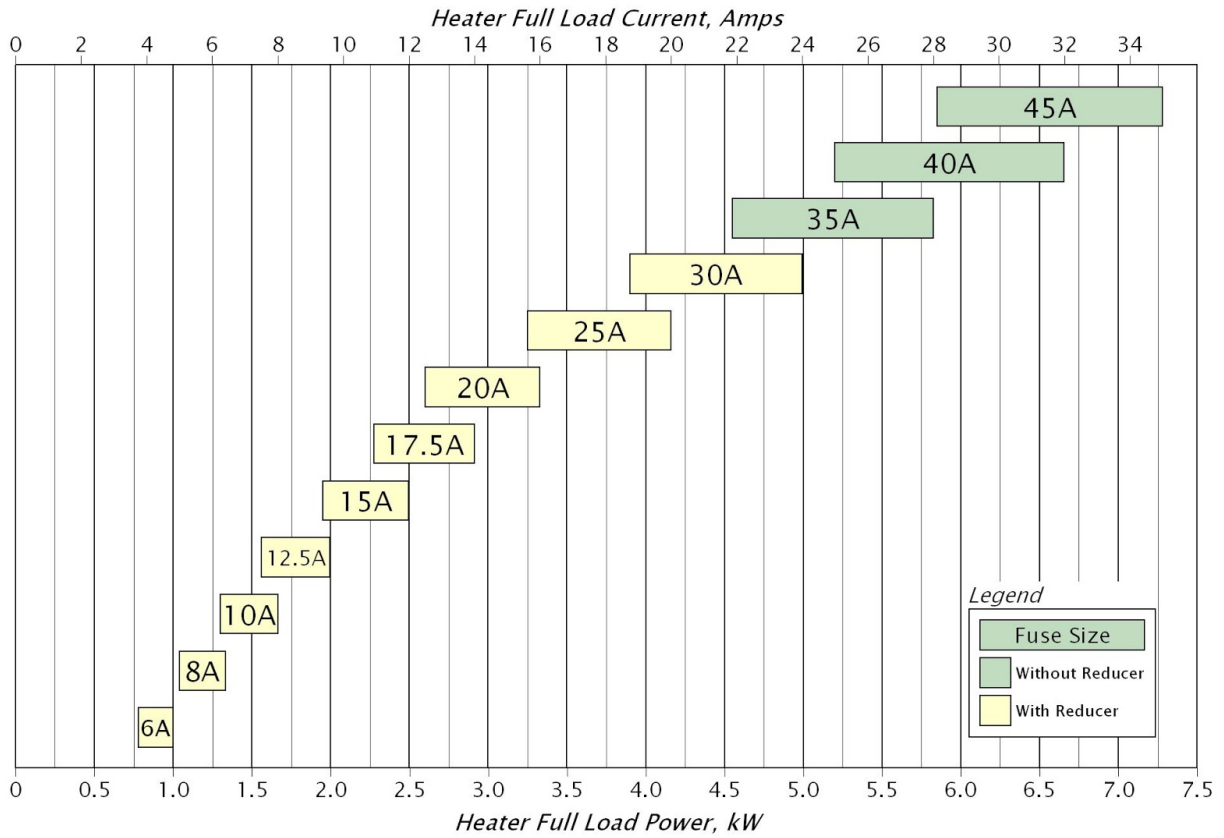


Table 3 Main Branch Fusing Table (IFPA-208-1P-35A)

		Fuse Size												
		Littlefuse® LRUJ63 Fuse Reducers Required for 1-30A Fuses										No Fuse Reducers		
		5A	6A	8A	10A	12A	15A	17.5A	20A	25A	30A	35A	40A	45A
Power, kW	Min	0.65	0.78	1.04	1.30	1.56	1.95	2.28	2.60	3.25	3.90	4.55	5.20	5.85
	Max	0.83	1.00	1.33	1.66	2.00	2.50	2.91	3.33	4.16	4.99	5.82	6.66	7.28
FLA, Amps	Min	3.13	3.75	5.00	6.25	7.50	9.38	10.9	12.5	15.6	18.8	21.9	25.0	28.1
	Max	4.00	4.80	6.40	8.00	9.60	12.0	14.0	16.0	20.0	24.0	28.0	32.0	35.0



# Heater Fuse Sizing Tables

Figure 4 Main Branch Fusing Diagram (IFPA-240-1P-35A)

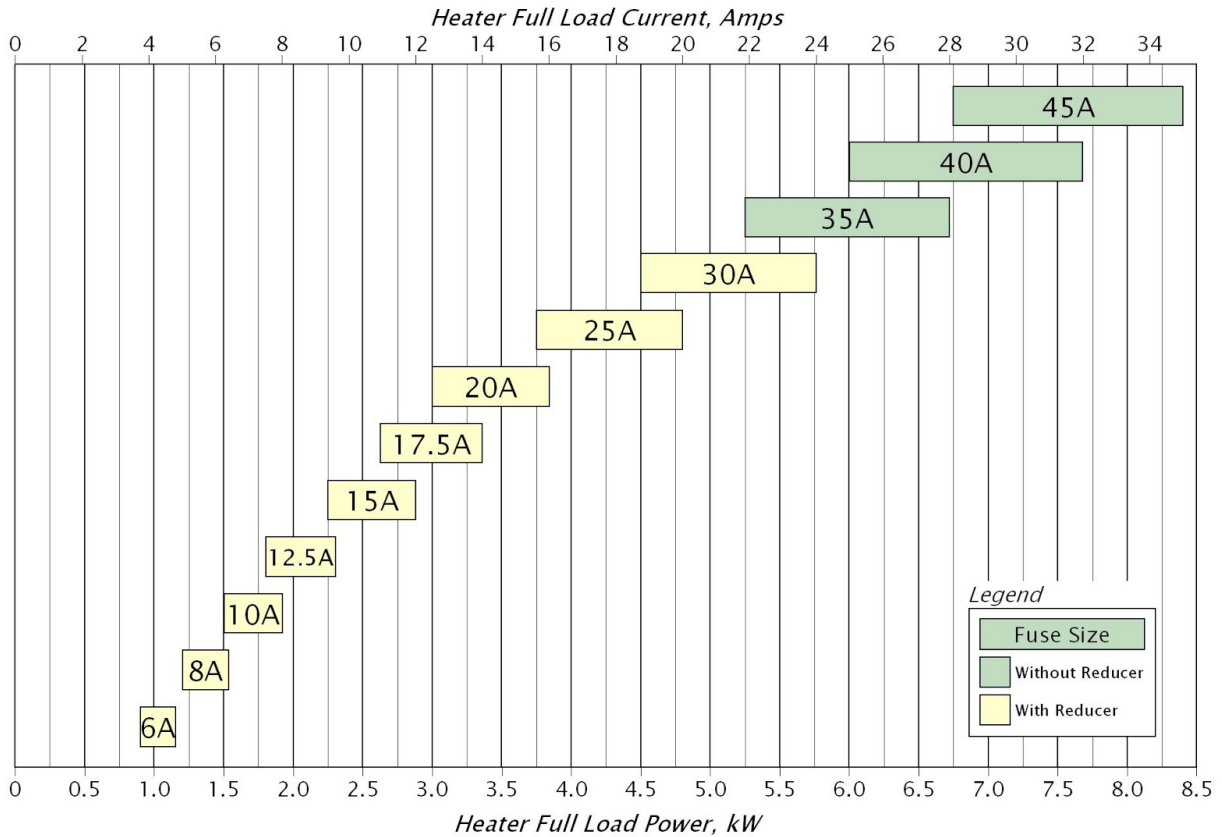


Table 4 Main Branch Fusing Table (IFPA-240-1P-35A)

		Fuse Size												
		Littlefuse® LRUJ63 Fuse Reducers Required for 1-30A Fuses										No Fuse Reducers		
		5A	6A	8A	10A	12A	15A	17.5A	20A	25A	30A	35A	40A	45A
Power, kW	Min	0.75	0.90	1.20	1.50	1.80	2.25	2.63	3.00	3.75	4.50	5.25	6.00	6.75
	Max	0.96	1.15	1.54	1.92	2.30	2.88	3.36	3.84	4.80	5.76	6.72	7.68	8.40
FLA, Amps	Min	3.13	3.75	5.00	6.25	7.50	9.38	10.9	12.5	15.6	18.8	21.9	25.0	28.1
	Max	4.00	4.80	6.40	8.00	9.60	12.0	14.0	16.0	20.0	24.0	28.0	32.0	35.0



# Heater Fuse Sizing Tables

Figure 5 Main Branch Fusing Diagram (IFPA-480-1P-35A)

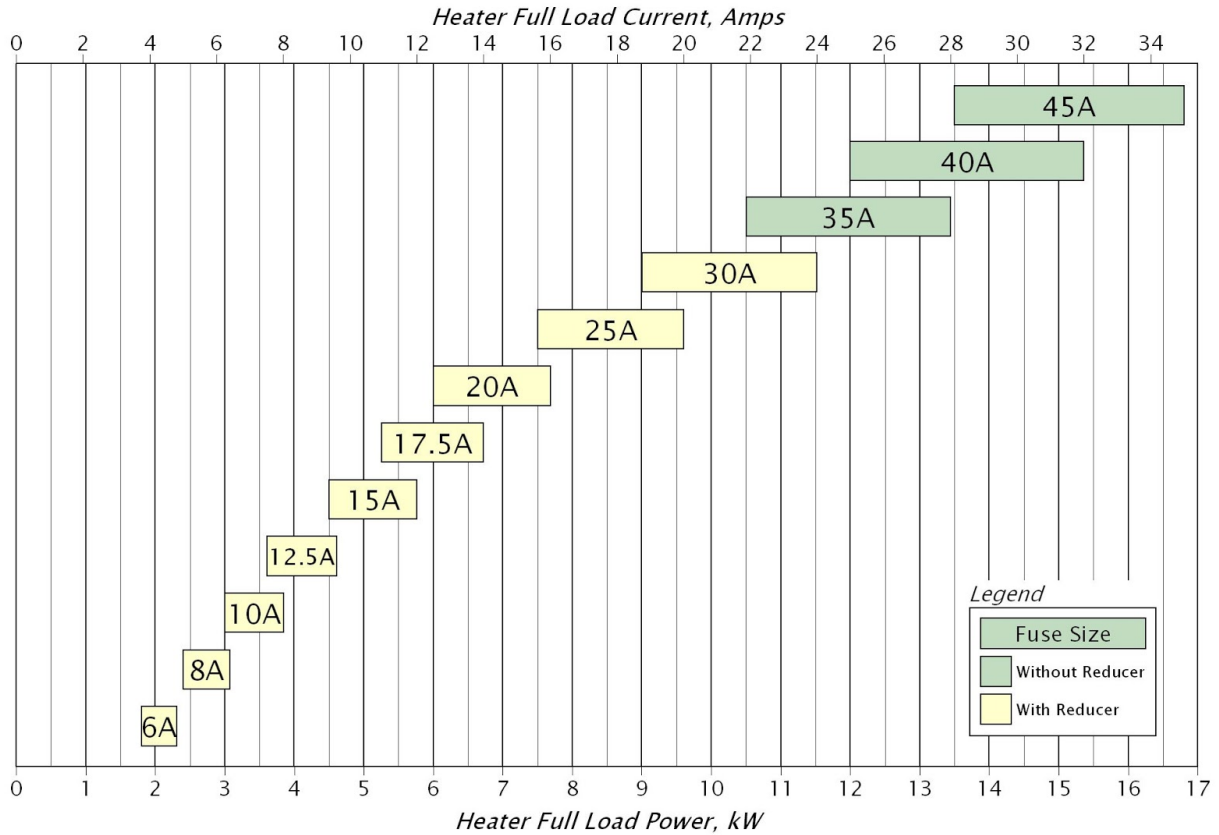


Table 5 Main Branch Fusing Table (IFPA-480-1P-35A)

		Fuse Size												
		Littlefuse® LRJ63 Fuse Reducers Required for 1-30A Fuses										No Fuse Reducers		
		5A	6A	8A	10A	12A	15A	17.5A	20A	25A	30A	35A	40A	45A
Power, kW	Min	1.50	1.80	2.40	3.00	3.60	4.50	5.25	6.00	7.50	9.00	10.5	12.0	13.5
	Max	1.92	2.30	3.07	3.84	4.61	5.76	6.72	7.68	9.60	11.5	13.4	15.4	16.8
FLA, Amps	Min	3.13	3.75	5.00	6.25	7.50	9.38	10.9	12.5	15.6	18.8	21.9	25.0	28.1
	Max	4.00	4.80	6.40	8.00	9.60	12.0	14.0	16.0	20.0	24.0	28.0	32.0	35.0



# Heater Fuse Sizing Tables

Figure 6 Main Branch Fusing Diagram (IFPA-208-1P-24A)

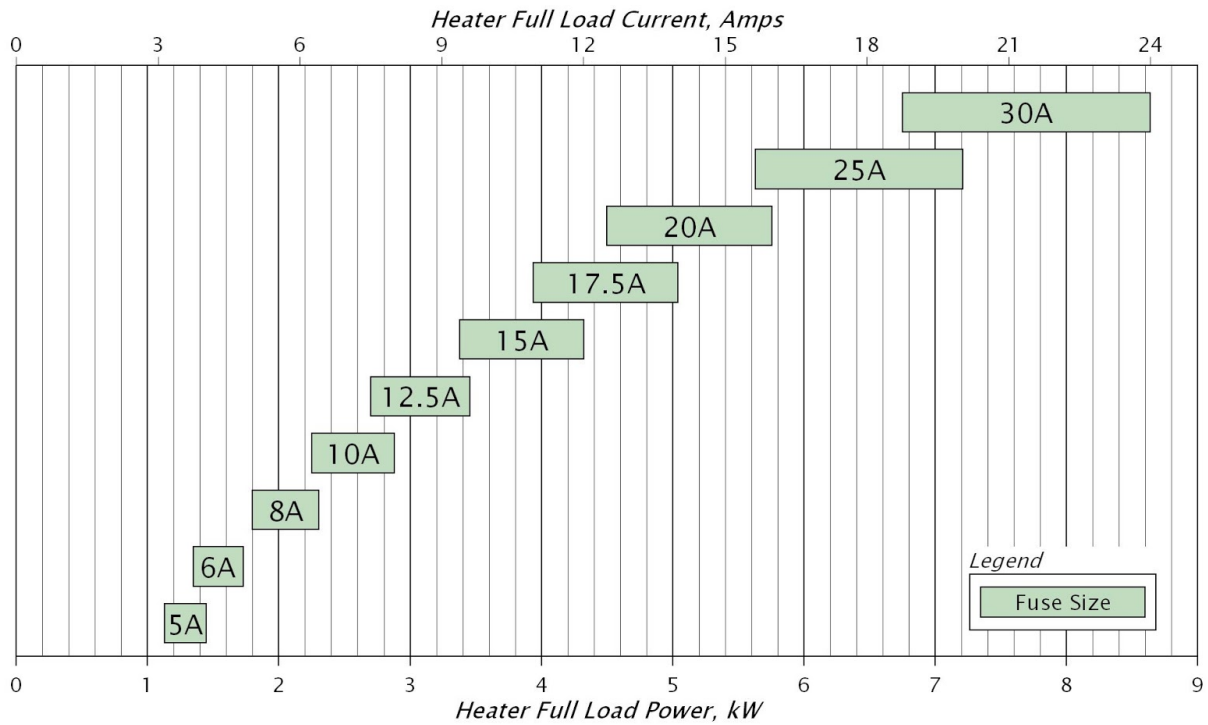


Table 6 Main Branch Fusing Table (IFPA-208-1P-24A)

		Fuse Size									
		5A	6A	8A	10A	12A	15A	17.5A	20A	25A	30A
Power, kW	Min	1.13	1.35	1.80	2.25	2.70	3.38	3.94	4.50	5.63	6.75
	Max	1.44	1.73	2.31	2.88	3.46	4.32	5.04	5.76	7.21	8.65
FLA, Amps	Min	3.13	3.75	5.00	6.25	7.50	9.38	10.9	12.5	15.6	18.8
	Max	4.00	4.80	6.40	8.00	9.60	12.0	14.0	16.0	20.0	24.0



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# Heater Fuse Sizing Tables

Figure 7 Main Branch Fusing Diagram (IFPA-480-3P-24A)

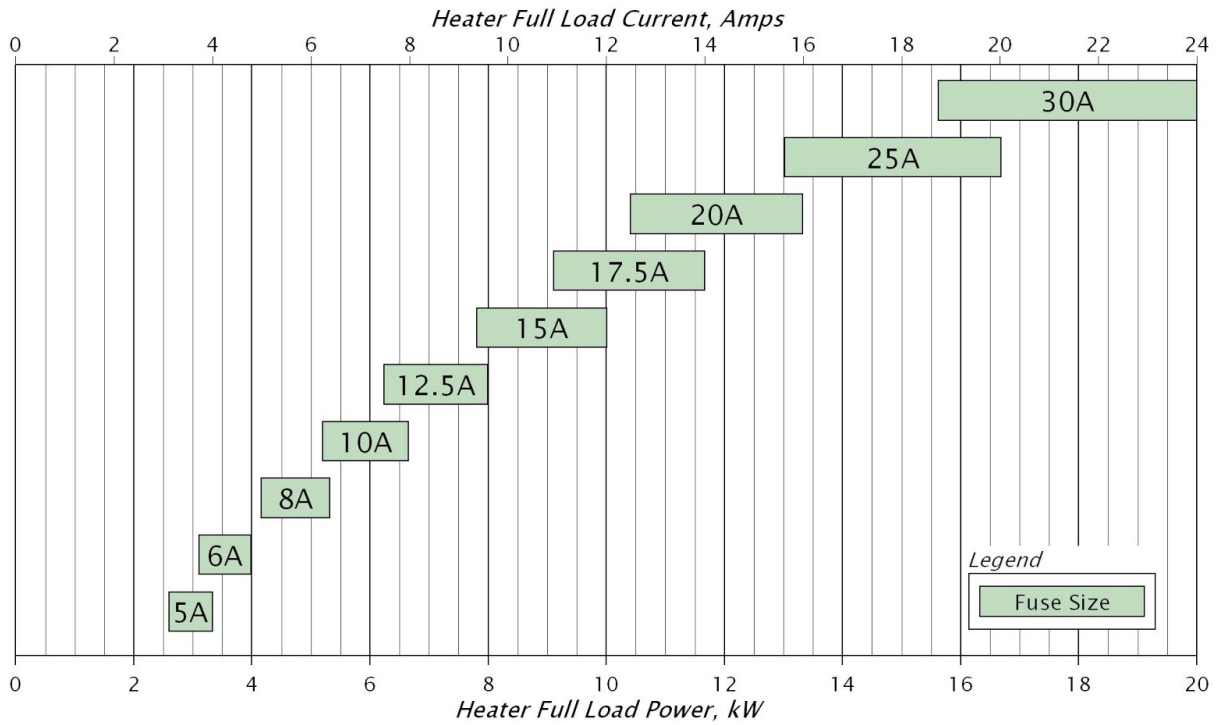


Table 7 Main Branch Fusing Table (IFPA-480-3P-24A)

		Fuse Size									
		5A	6A	8A	10A	12A	15A	17.5A	20A	25A	30A
Power, kW	Min	2.60	3.12	4.16	5.20	6.24	7.79	9.09	10.4	13.0	15.6
	Max	3.33	3.99	5.32	6.65	7.98	9.98	11.6	13.3	16.6	20.0
FLA, Amps	Min	3.13	3.75	5.00	6.25	7.50	9.38	10.9	12.5	15.6	18.8
	Max	4.00	4.80	6.40	8.00	9.60	12.0	14.0	16.0	20.0	24.0



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# Heater Fuse Sizing Tables

Figure 8 Main Branch Fusing Diagram (IFPA-208-3P-64A)

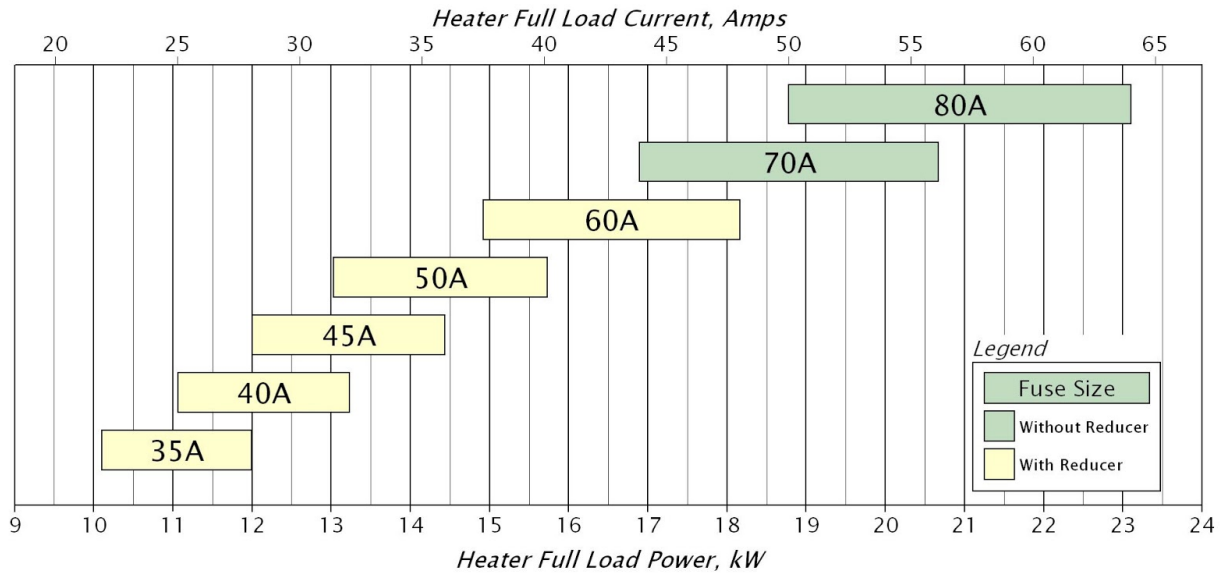


Table 8 Main Branch Fusing Table (IFPA-208-3P-64A)

		Fuse Size						
		Littlefuse® LRUJ16 Fuse Reducers Required for 35-60A Fuses					No Fuse Reducers	
		35A	40A	45A	50A	60A	70A	80A
Power, kW	Min	7.88	9.01	10.1	11.3	13.5	15.8	18.0
	Max	10.1	11.5	13.0	14.4	17.3	20.2	23.1
FLA, Amps	Min	21.9	25.0	28.1	31.3	37.5	43.8	50.0
	Max	28.0	32.0	36.0	40.0	48.0	56.0	64.0



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# Heater Fuse Sizing Tables

Figure 9 Main Branch Fusing Diagram (IFPA-480-3P-64A)

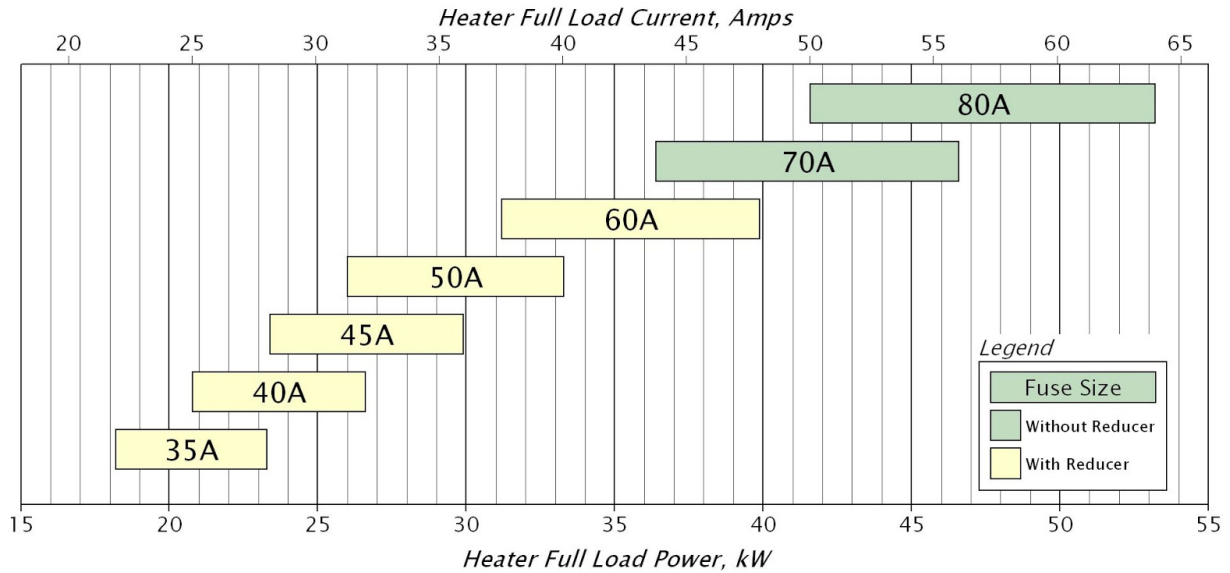


Table 9 Main Branch Fusing Table (IFPA-480-3P-64A)

		Fuse Size						
		Littlefuse® LRUJ16 Fuse Reducers Required for 35-60A Fuses					No Fuse Reducers	
		35A	40A	45A	50A	60A	70A	80A
Power, kW	Min	18.2	20.8	23.4	26.0	31.2	36.4	41.6
	Max	23.3	26.6	29.9	33.3	39.9	46.6	53.2
FLA, Amps	Min	21.9	25.0	28.1	31.3	37.5	43.8	50.0
	Max	28.0	32.0	36.0	40.0	48.0	56.0	64.0

