

Wiring Information

Amperage Conversion Table

Watts	Volts Single Phase			Volts 3 Phase Balanced Load		Watts
	120	240	480	240	480	
100	0.83	0.42	0.21	0.24	0.12	100
150	1.3	0.63	0.31	0.36	0.18	150
200	1.7	0.83	0.42	0.48	0.24	200
250	2.1	1.0	0.52	0.60	0.30	250
300	2.5	1.3	0.63	0.72	0.36	300
350	2.9	1.5	0.73	0.84	0.42	350
400	3.3	1.7	0.83	1.0	0.48	400
450	3.8	1.9	0.94	1.1	0.54	450
500	4.2	2.1	1.0	1.2	0.60	500
600	5.0	2.5	1.3	1.4	0.72	600
700	5.8	2.9	1.5	1.7	0.84	700
750	6.3	3.1	1.6	1.8	0.90	750
800	6.7	3.3	1.7	1.9	1.0	800
900	7.5	3.8	1.9	2.2	1.1	900
1000	8.3	4.2	2.1	2.4	1.2	1000
1100	9.2	4.6	2.3	2.6	1.3	1100
1200	10.0	5.0	2.5	2.9	1.4	1200
1250	10.4	5.2	2.6	3.0	1.5	1250
1300	10.8	5.4	2.7	3.1	1.6	1300
1400	11.7	5.8	2.9	3.4	1.7	1400
1500	12.5	6.3	3.1	3.6	1.8	1500
1600	13.3	6.7	3.3	3.8	1.9	1600
1700	14.2	7.1	3.5	4.1	2.0	1700
1750	14.6	7.3	3.6	4.2	2.1	1750
1800	15.0	7.5	3.8	4.3	2.2	1800
1900	15.8	7.9	4.0	4.6	2.3	1900
2000	16.7	8.3	4.2	4.8	2.4	2000
2200	18.3	9.2	4.6	5.3	2.6	2200
2500	20.8	10.4	5.2	6.0	3.0	2500
2750	22.9	11.5	5.7	6.6	3.3	2750
3000	25.0	12.5	6.3	7.2	3.6	3000
3500	29.2	14.6	7.3	8.4	4.2	3500
4000	33.3	16.7	8.3	9.6	4.8	4000
4500	37.5	18.8	9.4	10.8	5.4	4500
5000	41.7	20.8	10.4	12.0	6.0	5000
6000	50.0	25.0	12.5	14.4	7.2	6000
7000	58.3	29.2	14.6	16.8	8.4	7000
8000	66.7	33.3	16.7	19.2	9.6	8000
9000	75.0	37.5	18.8	21.7	10.8	9000
10000	83.3	41.7	20.8	24.1	12.0	10000

Wiring Hints

1. Wire gauge, conductor material, and wire insulation choice depend upon current draw, electric service voltage and operating temperature. In high temperature environments, high temperature insulation and/or nickel coated copper or nickel conductors may be required.
2. Heater terminal connections should be tightened with maximum torque consistent with terminal strength. When possible, a wrench or pliers should be used to support the heater terminal to prevent it from twisting when tightening connections.
3. It is good wiring practice to run thermocouple circuit wiring in a separate conduit.
4. Thermostat capillary tubing must be kept away from heater terminals.
5. Safe operation of heaters equipped with NEMA 4 and NEMA 7 terminal housings depends on electrical wiring meeting the national electrical code for these locations and limiting maximum operation temperatures. Approved pressure and/or temperatures limiting controls must be used to assure safe operation in the event of system malfunctions.
6. An integral thermostat functions as a temperature control only and is not a fail-safe device. An approved pressure and/or temperature limit control should be used in the event of system malfunctions.
7. Never perform any type of service on heaters prior to disconnecting all electrical power.



All wiring should be done in accordance with the National Electrical Code and applicable local codes.

Selection of Hook-Up Lead Wire Gauge

Approximate Current Carrying Capacities of High Temperature insulated Nickel (Grade "A") and Nickel Plated Copper wire based on ambient temperature of 40°C (104°F).

This table should only be used as a starting point when establishing ratings for any given situation. It is recommended that design engineers desiring accurate ampacity data refer to the current National Electric Code Handbook, Article 310-15-310-84.

Current Carrying Capacity Table Ambient Temperature at 40°C (104°F)

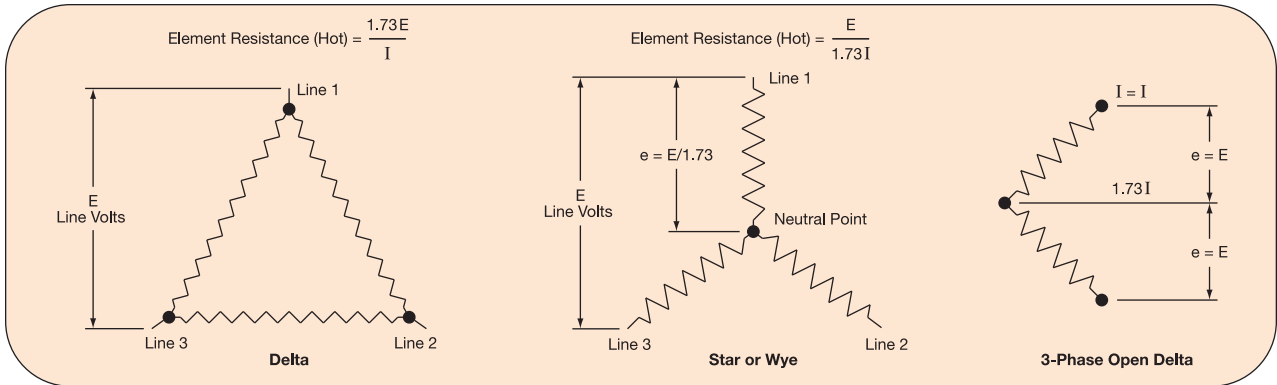
Conductor Size AWG	Conductor Type and Temperature Rating			
	250°C (482°F) "A" Nickel	250°C (482°F) NPC 2%-10%	450°C (842°F) "A" Nickel	450°C (842°F) NCC 27%
24	4	8	4.3	9
22	5	10.8	5.6	12
20	7	15	8	18
18	9.4	20	11	23
16	12	26	14	30
14	18	39	21	45
12	25	54	26	56
10	34	73	35	75

For ambient temperatures other than 40°C (104°F), multiply the ampacities shown above by the appropriate factor shown below.

Ambient Temperature Correction Factors

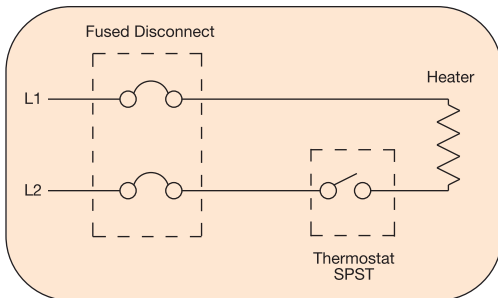
Ambient Temperature °C	Wire Temperature Rating		Ambient Temperature °F
	250°C (482°F)	450°C (842°F)	
41-50	0.98	0.99	106-122
51-60	0.95	0.99	124-140
61-70	0.93	0.96	142-158
71-80	0.9	0.95	160-176
81-90	0.87	0.93	177-194
91-100	0.85	0.92	195-212
101-120	0.79	0.89	213-248
121-140	0.71	0.86	249-284
141-160	0.65	0.84	285-320
161-180	0.58	0.81	321-356
181-200	0.49	0.78	357-392
201-225	0.35	0.74	393-437
226-250	—	0.69	439-482
251-275	—	0.65	483-527
276-300	—	0.6	528-572
301-325	—	0.55	573-617
326-350	—	0.49	618-662
351-375	—	0.42	663-707
376-400	—	0.34	708-752

Wiring Diagrams

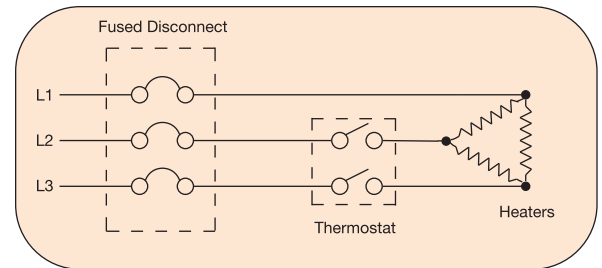


For current in 3 phase circuits: $I = \frac{W}{1.73E}$

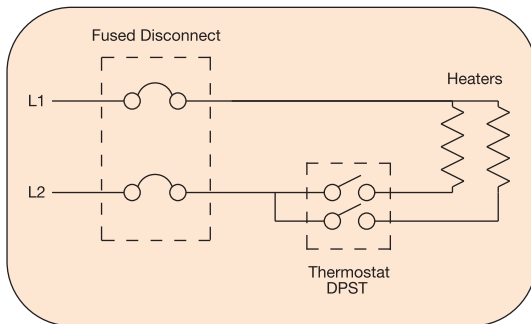
Note: If elements are designed for 3-phase delta connection wattage output may be reduced to 1/3 by rewiring to 3-phase WYE.



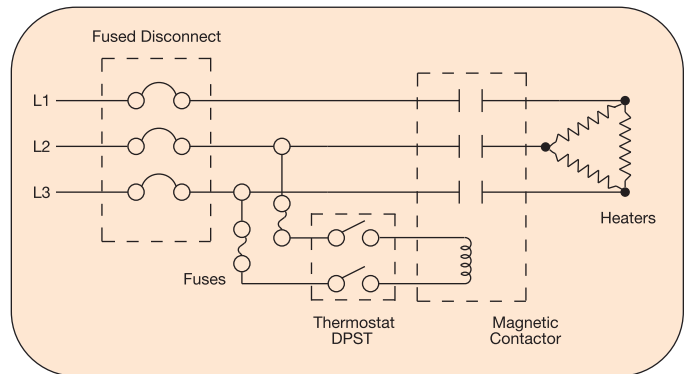
Single-phase circuit with SPST thermostat.



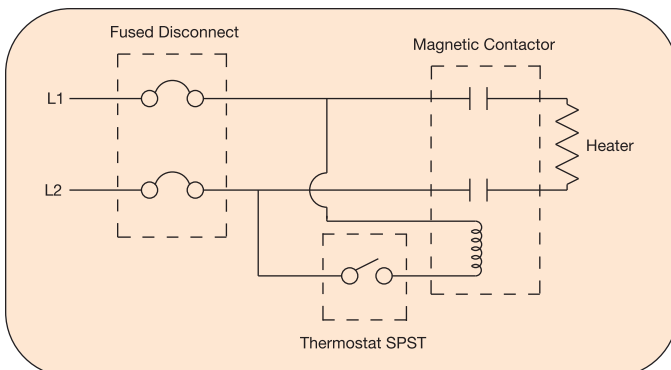
Three-phase circuit with DPST thermostat.



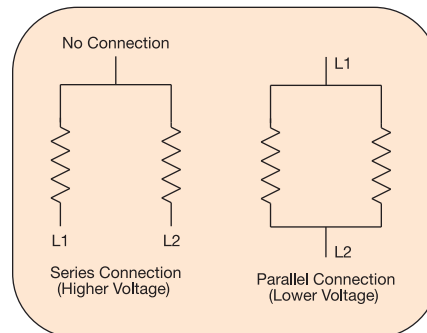
Single-phase circuit with thermostat connected for half current load across each contact.



Three-phase circuit when line current exceeds thermostat rating.



Single-phase circuit when line current exceeds thermostat rating.



Dual Voltage

Example: Two 120V heaters wired in parallel for 120V operation or wired in series for 240V operation.

NOTE: To reduce wattage in a system, two heaters rated at 240 volts wired in series to a 240 volt power supply will generate 1/4 of their rated wattage.