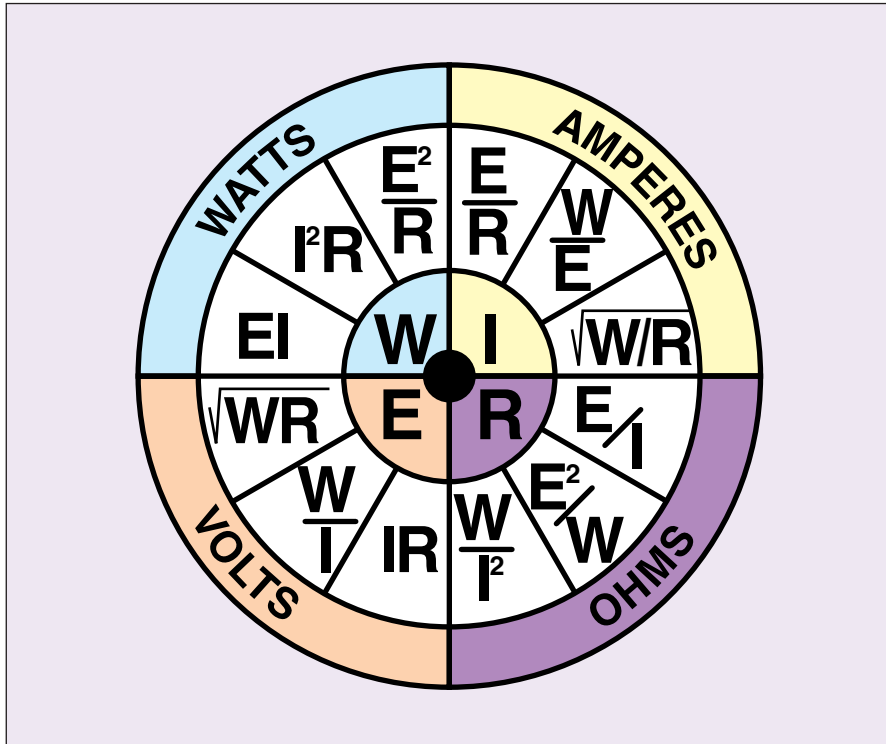


This article is provided as a reference for use as is. If you have further questions or comments about this article please contact us at <http://www.calservice.net> - [Click Here](#) to go to our Reference Materials.

## OHM'S LAW



### VARIATIONS OF OHM'S LAW

#### VOLTS

$$\text{VOLTS} = \sqrt{\text{WATTS} \times \text{OHMS}}$$

$$\text{VOLTS} = \frac{\text{WATTS}}{\text{AMPERES}}$$

$$\text{VOLTS} = \text{AMPERES} \times \text{OHMS}$$

#### OHMS

$$\text{OHMS} = \frac{\text{VOLTS}}{\text{AMPERES}}$$

$$\text{OHMS} = \frac{\text{VOLTS}^2}{\text{WATTS}}$$

$$\text{OHMS} = \frac{\text{WATTS}^2}{\text{AMPERES}^2}$$

#### AMPERES

$$\text{AMPERES} = \frac{\text{VOLTS}}{\text{OHMS}}$$

$$\text{AMPERES} = \frac{\text{WATTS}}{\text{VOLTS}}$$

$$\text{AMPERES} = \frac{\text{WATTS}}{\text{OHMS}}$$

#### WATTS

$$\text{WATTS} = \frac{\text{VOLTS}^2}{\text{OHMS}}$$

$$\text{WATTS} = \text{AMPERES}^2 \times \text{OHMS}$$

$$\text{WATTS} = \text{VOLTS} \times \text{AMPERES}$$

**Table 11 Currents for resistance heating loads**

kW	Single phase					Three phase balanced load			
	120V	208V	240V	440V	480V	208V	240V	440V	480V
1	8.4	4.8	4.2	2.3	2.1	2.8	2.5	1.4	1.3
2	16.7	9.7	8.4	4.6	4.2	5.6	4.9	2.7	2.5
3	25	14.5	12.5	6.9	6.3	8.4	7.3	4	3.7
4	33.4	19.3	16.7	9.1	8.4	11.2	9.7	5.3	4.9
5	41.7	24.1	20.9	11.4	10.5	13.9	12.1	6.6	6.1
6	50	28.9	25	13.7	12.5	16.7	14.5	7.9	7.3
7.5	62.5	36.1	31.3	17.1	15.7	20.9	18.1	9.9	9.1
10	83.4	48.1	41.7	22.8	20.9	27.8	24.1	13.2	12.1
12	100	57.7	50	27.3	25	33.4	29	15.8	14.5
15	125	72.2	62.5	34.1	31.2	41.7	36.2	19.7	18.1
20	167	96.2	83.4	45.5	41.7	55.6	48.2	26.3	24.1
25	209	121	105	56.9	52.1	69.5	60.3	32.9	30.1
30	250	145	125	68.2	62.5	83.4	72.3	39.4	36.2
50	417	241	209	114	105	139	121	65.7	60.3
75	625	361	313	171	157	209	181	98.6	90.4
100	834	481	417	228	209	278	241	132	121

**Percent of rated wattage for various applied voltages**

Applied Voltage	Rated Voltage														
	110	115	120	208	220	230	240	277	380	415	440	460	480	550	
110	100%	91%	84%	28%	25%	23%	21%	16%	8.4%	7%	6.2%	5.7%	5.2%	4%	
115	109%	100%	92%	31%	27%	25%	23%	17%	9.0%	7.6%	6.7%	6.2%	5.7%	4.3%	
120	119%	109%	100%	33%	30%	27%	25%	19%	10%	8.4%	7.4%	6.8%	6.3%	4.8%	
208			300%	100%	89%	82%	75%	56%	30%	25%	22%	20%	19%	14%	
220				112%	100%	91%	84%	63%	34%	28%	25%	23%	21%	16%	
230				122%	109%	100%	92%	69%	37%	31%	27%	25%	23%	17%	
240				133%	119%	109%	100%	75%	40%	33%	30%	27%	25%	19%	
277							133%	100%	53%	45%	40%	36%	33%	25%	
380								188%	100%	84%	74%	68%	63%	47%	
415									119%	100%	89%	81%	75%	57%	
440										112%	100%	91%	84%	64%	
460										123%	109%	100%	92%	70%	
480											119%	109%	100%	76%	
550												156%	143%	100%	

$$\text{Actual Wattage} = \text{Rated Wattage} \times \frac{\text{Applied Voltage}^2}{\text{Rated Voltage}^2}$$