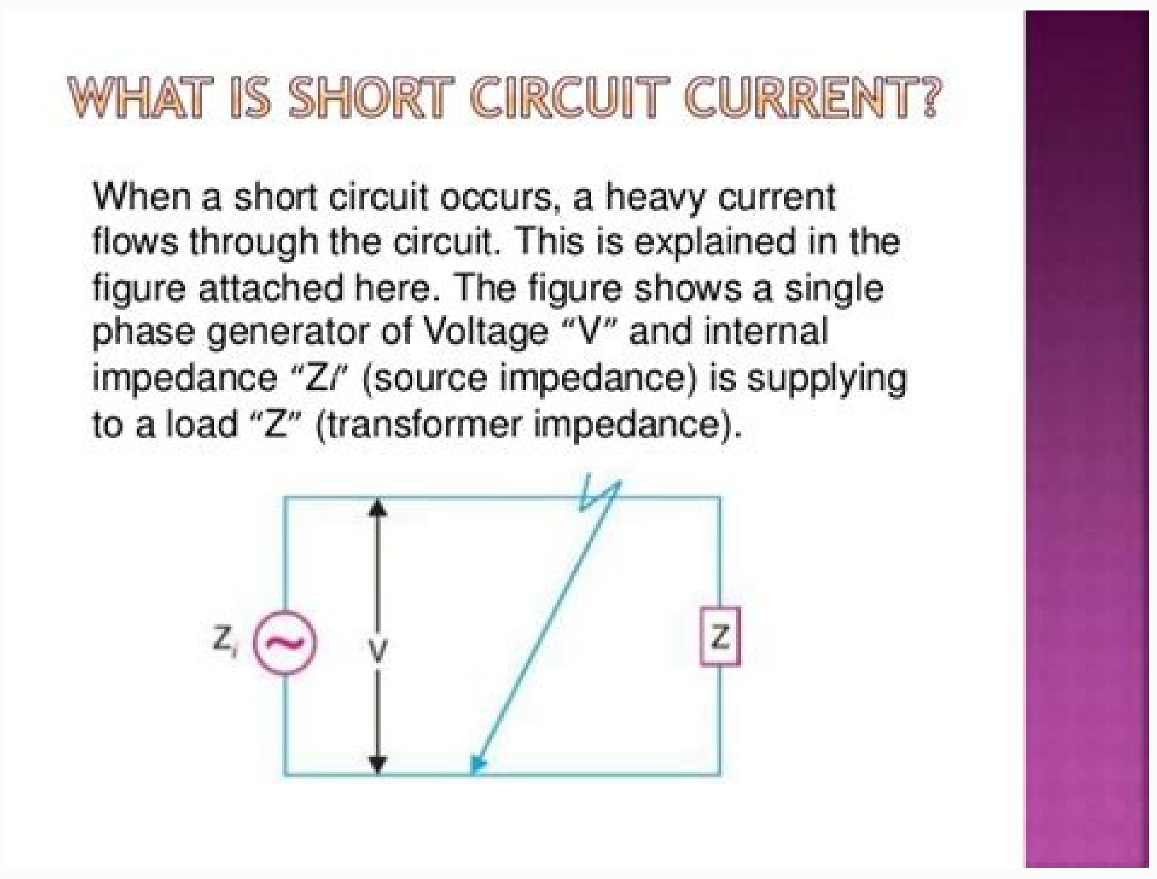
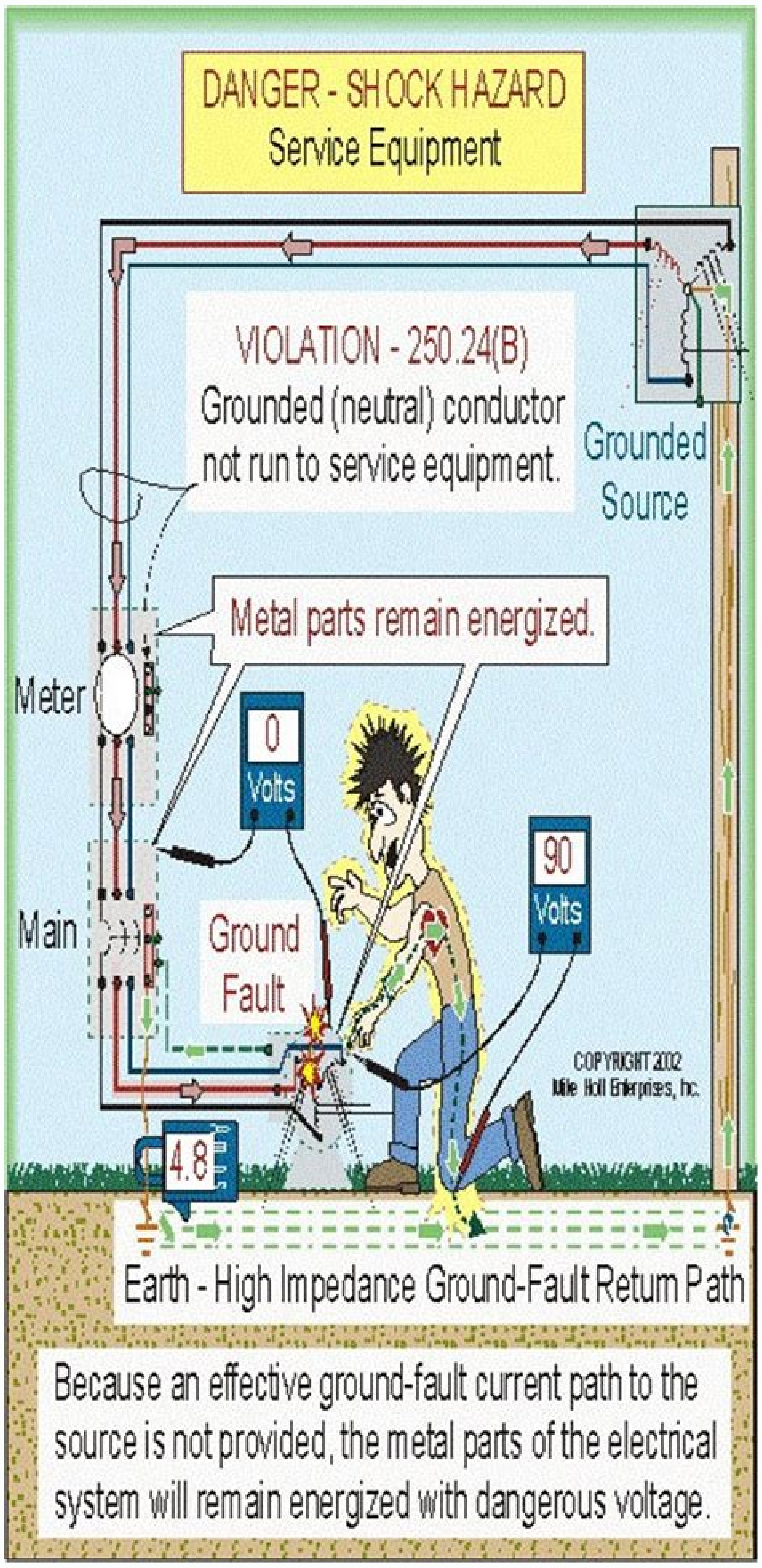
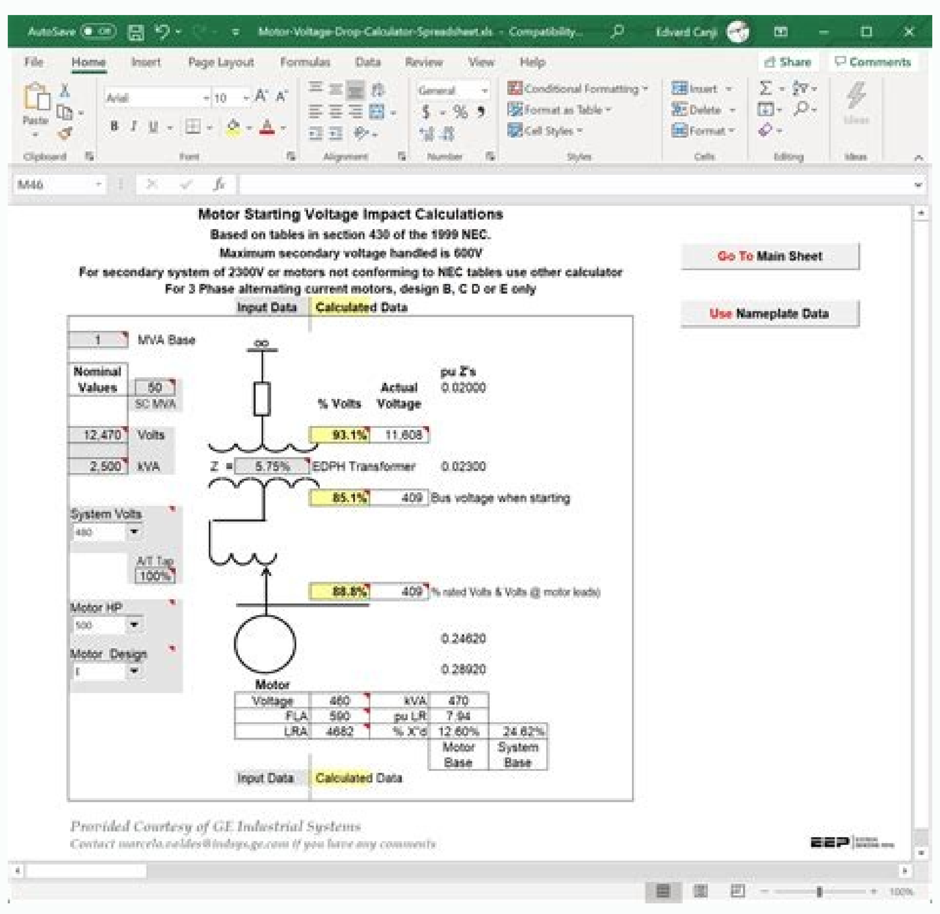
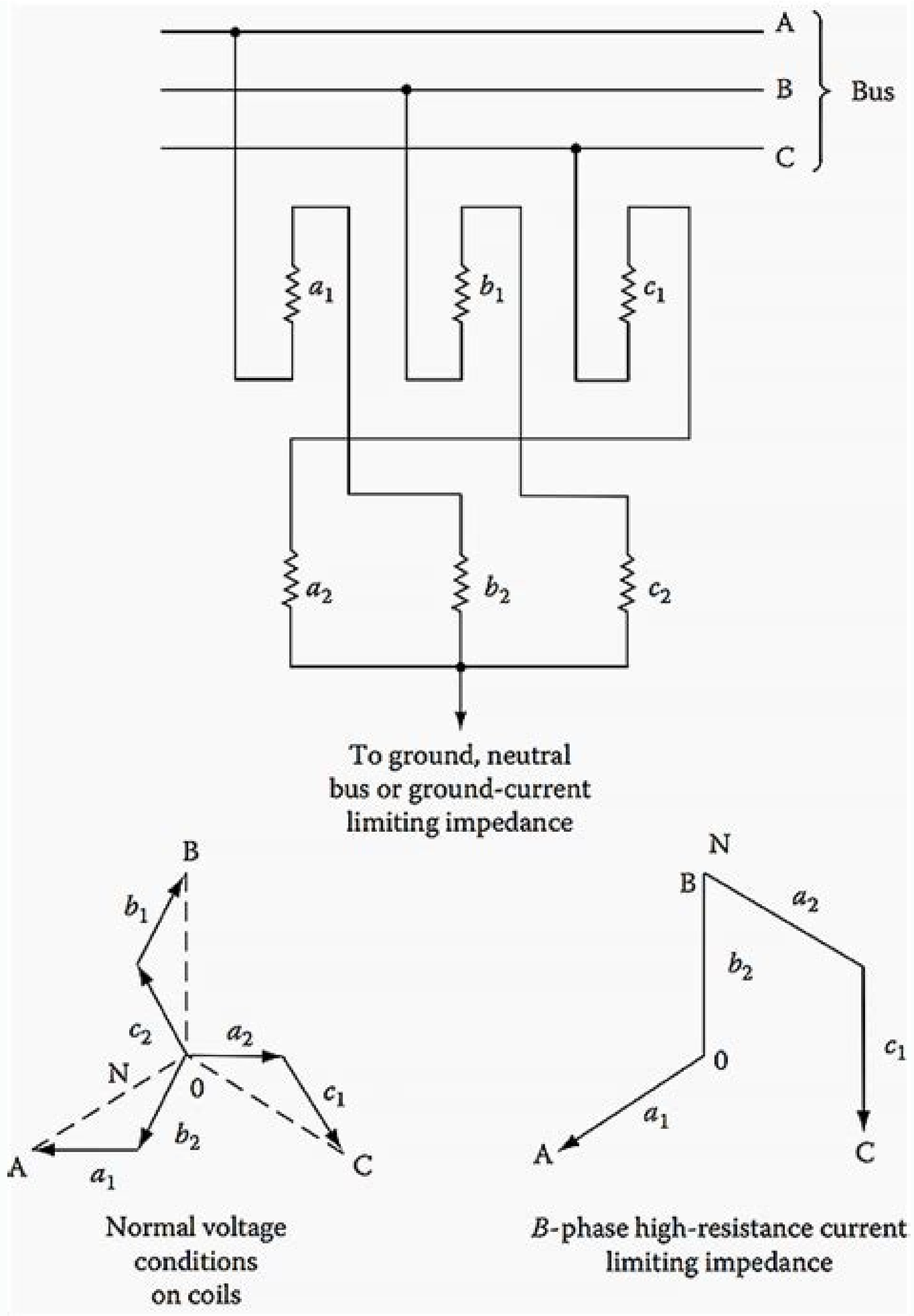
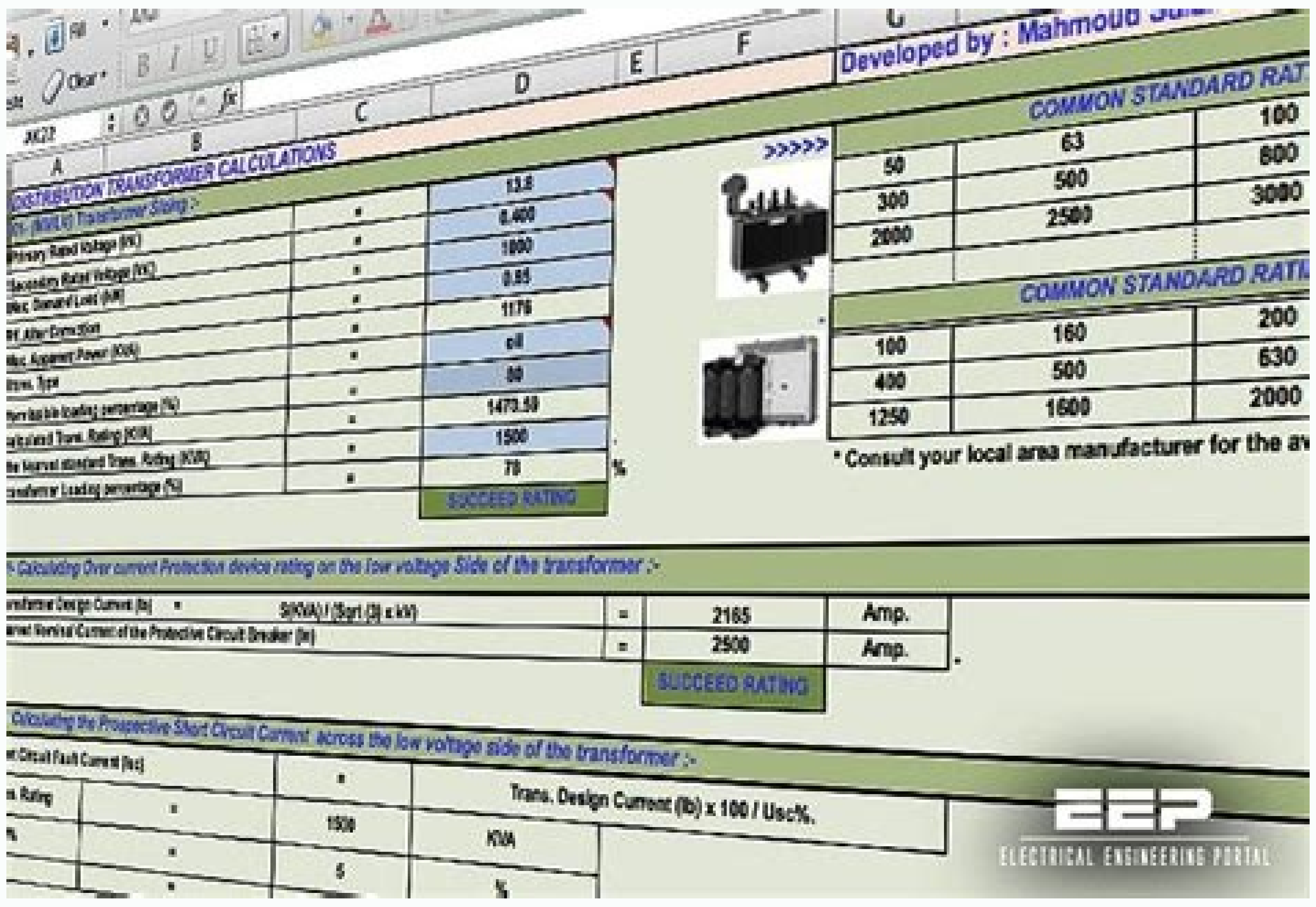
**Transformer voltage and current calculations**






Secondary voltage (Vs): The rated voltage of the secondary voltage. Assuming an ideal transformer, determine (a) the primary and secondary full-load currents, (b) the transformer turns ratio.a) V1 = 4000 V, V2 = 400 V,Transformer Rating = 50 kVA = V1 × I1 = V2 × I2Primary full-load current, I1 = (50 × 1000 / 4000) = 12.5 ASecondary full-load current, I2 = (50 × 1000 / 400) = 125 Ab) Turns Ratio = N1 / N2 = V1 / V2 = (4000 / 400) = 10You may also be interested in our Voltage Divider Calculator or Motor FLA Calculator Phase: Specify the phase arrangement. $n = \dfrac{11000}{420}$ $n = 26.2$ A transformer is essentially just two coils, primary and secondary, that are placed next to each other. If you're surprised that magnetic field can transfer energy, you might check the energy density of fields calculator. Solution: Secondary Voltage: 240V Load Current: 62.5A Transformer Rating = P = V x I Putting the values: P = 240V x 62.5A P = 15000 VA = 15 kVA Sizing a Three Phase Transformer Rating of a Three Phase Transformer: P = √3 x V x I Where: V = Primary or Secondary Voltage I = Primary or Secondary Current √3 = 1.732 P = Power of transformer in VA (Volt-Amps) Rating of a Three phase transformer in kVA kVA = (√3 x V x I) / 1000 Example: A 3-phase transformer having the primary voltage and current of 7200V and 4A respectively. The primary voltages or high voltages (HV) is 11000 V = 11kV. Now you know how to properly size a three phase and single phase transformer with suitable rating in VA or kVA for home appliances or any other load applications. The primary winding full load current Ip is calculated as: $I_{p}= \dfrac{S}{\sqrt{3} V_{p}}$ Where, S is the transformer rating. The transformer turns ratio n is calculated as: $n = \dfrac{ V_{p} }{ V_{s} }$, Where, Vp is the primary winding voltage. Primary voltage (Vp): The rated voltage of the primary winding. In simple words, Transformer rating in kVA = 100 kVA Primary Voltages = 11000 = 11kV Primary Current = 5.25 A Secondary Voltages = 415V Secondary Current = 139.1 Amperes. Below are the two simple formulas which can be used to find and calculate the rating of Single Phase and Three Phase Transformers. Sizing a Single Phase Transformer Rating of Single Phase Transformer: P = V x I Where: V = Primary or Secondary Voltage I = Primary or Secondary Current P = Power of transformer in VA (Volt-Amps) Rating of a single phase transformer in kVA kVA= (V x I) / 1000 Example: Suppose a 1-phase transformer having the secondary voltage and current of 240V and 62.5A respectively. 1 Phase AC or 3 phase AC. Vp is the primary winding voltage. The nameplate clearly shows the rating of transformer is 100 kVA. Related Posts: Now, look at the General nameplate rating of a 100kVA transformer. This is because the strength of the magnetic field depends on the number of windings in the primary coil. Now calculate for the rating of transformer according to P = V x I (Primary voltage x primary current) P = 11000V x 5.25A = 57,750 VA = 57.75kVA Or P = V x I (Secondary voltages x Secondary Current) P= 415V x 139.1A = 57,726 VA = 57.72kVA As you noticed, the rating of the transformer (on the nameplate) is 100 kVA but according to the calculation, the calculated value is 57kVA. Transformer rating (S): The tranformer rating in VA, kVA or MVA. Example 1: Calculate transformer full load current Calculate the secondary full load current of a a 200 kVA, 11 kV to 420 V, step down transformer. In any case, both the voltage and currents should be form an individual side either primary or secondary respectively ( e.g. Primary voltage x primary current or secondary voltage x secondary current). P = √3 x V x I P = √3 V x I (Primary voltage x primary current) P = √3 x 11000V x 5.25A = 1.732 x 11000V x 5.25A = 100,025 VA = 100kVA Or P = √3 x V x I (Secondary voltages x Secondary Current) P= √3 x 415V x 139.1A = 1.732 x 415V x 139.1A= 99,985 VA ≈ 100kVA Consider the (next) following example. We know that a transformer is always rated in kVA. In a step down transformer, this will be the higher voltage. How to calculate transformer secondary full load current? This magnetic field induces a voltage difference, an electromotive force, in the secondary coil. And the primary current on the high voltage (HV) side is 5.25 Amperes. Coming back to the transformer, essentially the magnetic field transfers the energy from one circuit to the other. Calculate the size of the three phase transformer. $I_{s}= \dfrac{200000}{\sqrt{3} \cdot 420}$ $I_{s}= 275 \textrm{ A}$ Example 2: Calculate transformer turns ratio Calculate the secondary full load current of a a 200 kVA, 11 kV to 420 V, step down transformer. Then the only thing that matters is the ratio of the number of windings between the primary and secondary coil. The following table shows the dry transformer data of standard kVA rating, Voltage and Current rating for both single phase and three phase transformers. Well, The difference comes due to ignorance of the fact that we used a single phase formula instead of three phase formula. Just enter any two values and click on calculate to find the desired value. You can learn more about the inductance checking the solenoid inductance calculator. The AC current running through the primary coil creates a varying magnetic field. Wait a moment and try again. This transformer calculator helps you to quickly and easily calculate the primary and secondary full-load currents of the transformer. Voltage (Line to line) = 208 V. How to calculate transformer turns ratio? Solution: Primary Voltage: 7200V Primary Current: 4A Transformer Rating = P = √3 x V x I Putting the values: P = 1.732 x 7200V x 4A P = 49,881 VA ≈ 50 kVA Related Posts: Transformer Rating in kVA Calculator The following calculator will calculate the rating of the transformer in kVA, Primary or secondary voltage and current respectively. Current (Line Current) = 139 A Now rating of the three phase transformer P = √3 x V x I P = √3 x 208 x 139A = 1.732 x 208 x 139 P = 50077 VA ≈ 50kVA Related Posts: That's it. To property size a transformer for a required home appliance, you should select the supply voltage and secondary load current in amperes. In a tep down transformer, this will be the lower voltage. The number of windings in the secondary coil determines the strength of the electromotive force. Single Phase Transformer Three Phase Transformer KVA Rating Amperes KVA Rating Amperes 120V 240V 600V 120V 240V 480V 600V 0.75 6.25 3.13 1.25 3 8.33 7.22 3.61 2.89 1 8.33 4.17 1.67 9 25 21.7 10.8 8.66 1.5 12.5 6.25 2.5 15 41.6 36.1 18 14.4 2 16.7 8.33 3.33 20 55.5 48.1 24.1 19.2 3 25 12.5 5 25 69.4 60.1 30.1 24.1 5 41.6 20.8 8.33 30 83.3 72.2 36.1 28.9 7.5 62.5 31.3 12.5 37.5 104 90.2 45.1 36.1 10 83.3 41.7 16.7 45 125 108 54.1 43.3 15 125 62.5 25 75 208 180 90.2 72.2 25 208 104 41.7 100 278 241 120 96.2 37.5 313 156 62.5 112.5 312 271 135 108 50 417 208 83.3 150 416 361 180 144 75 625 313 125 225 625 541 271 217 100 833 417 167 300 833 722 361 289 167 1392 696 278 500 1388 1203 601 481 250 2083 1042 417 750 2082 1804 902 722 Here is the table in the image format if you need to download as a reference. Also secondary voltage or low voltages (LV) is 415 Volts And secondary current (load current on low voltages (LV) side) is 139.1 Amperes. It also determines the turns ratio and type of transformer.User Instructions:Select the number of phases from the drop-down menuEnter the transformer rating and select the appropriate unitEnter the primary and secondary transformer voltagesClick on the "Calculate" button to obtain the results.ResultsPrimary Full-Load Current:Secondary Full-Load Current:Turns Ratio:Transformer Type: Single Phase Step Up TransformerThe transformer calculator uses the following formulas:Single Phase Transformer Full-Load Current (Amps)= kVA × 1000 / VThree Phase Transformer Full-Load Current (Amps) = kVA × 1000 / (1.732 × V)Where:kVA = transformer rating (kilovolt-amperes),V = voltage (volts).Turns Ratio = N1 / N2 = V1 / V2 = I2 / I1Where:N1 = number of turns on the primary,N2 = number of turns on the secondary,V1 = primary voltage,V2 = secondary voltage,I1 = primary current,I2 = secondary current.Example: A 50 kVA single-phase transformer has a 4000 V primary, and a 400 V secondary. In an idealized picture, we disregard all potential losses and assume that all the magnetic field from the primary coil passes through the secondary coil. Something went wrong. Calculate the size of the single-phase transformer. The secondary winding full load current Is is calculated as: $I_{s}= \dfrac{S}{\sqrt{3} V_{s}}$ Where, S is the transformer rating. It means it is a three phase transformer and we will use the associated formula for it. Let's clear it using the three phase transformer rating formula. Vs is the secondary winding voltage.

Let us assume, I (Primary) = Primary current in Amps. I (secondary) = Secondary current in Amps. V (primary) = Primary Voltage in Volts. V (secondary) = Secondary Voltage in Volts. Transformer current calculations: Transformer turns ratio, V (primary) * I (Primary) = V (secondary) * I (secondary). The primary voltage is equal to the product of the secondary voltage and primary … The Current Transformer ( C.T. ), is a type of "instrument transformer" that is designed to produce an alternating current in its secondary winding which is proportional to the current being measured in its primary.Current transformers reduce high voltage currents to a much lower value and provide a convenient way of safely monitoring the actual electrical current flowing in an AC … For Transformer, we should choose two types of cable such as the primary side and secondary side. The rating of the cable should be 150% of the full load current. i.e if your transformer's primary current is 450 Amps means, you should choose 450 *150% = … 24.03.2021 · • An example of cable voltage drop calculation. 4 runs of 120 mm2 3-core 6/10 (12) kV XLPE insulated cable 200 m in length feeds a 3kV 4000kW Medium Voltage Switchboard that has a full-load current of 855 amps, power factor is 0.9 lagging. In the power systems analysis field of electrical engineering, a per-unit system is the expression of system quantities as fractions of a defined base unit quantity. Calculations are simplified because quantities expressed as per-unit do not change when they are referred from one side of a transformer to the other. 11.08.2021 · I am JE of Nagbhir sub station of 132/25 kv newly electrified section and testing started of current transformer when test CT ratio by injecting current in primary bushing of old CT which was 20 years old CT installed in circuit,after testing values not found according to ratio,100 amps inject and found in secondary terminal 3.9 amps please send me solution.

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