Click to verify

Choose the motor type, then enter the full load current of the motor. Then press the calculate button to motor get no-load current. Also, the motor rated below 3 HP the motor will take up to 40% to 60% of the full load current at the delta connection. Motor no-load current Calculations:Motor no-load current is nothing but a measuring the motor current without connecting any mechanical loads in short form shaft will be driven by hand freely. Also at no load, the power factor becomes very poor. Since motor draws high reactive current rather than the active current. Therefore, the normal current calculation formula will not help you.Let we find out the no-load calculation formulaLearn More: Rate of Work Calculator, Formula, J/s CalculationsStar Connected motor:It means the three-phase motor will be connected in star connection (one end short and another end supply). The motor will take 10% of the full load current. therefore,No load current at star connection = 0.1 x Motor Full load current.I(No-load) = 10% x I(FLA)Delta connected Motor:It means the motor will be connected as the delta. (all winding series-connected and the junction will be connected to the power supply).No load current at delta connection = 0.3 x Motor Full load current.I(No-load) = 30% x I(FLA)Look at the difference between star-connected motor and delta connected motor, do you know why this difference?If you connect the motor at star connection means, the applied voltage will be reduced, hence as the voltage is proportional to the speed of the motor. The motor will run at 60% of the full speed. While decreasing the speed along with the voltage, the motor current will be decreased and the motor draws the current to remain the same speed.Learn More: Attraction Force Calculator, Formula, AF CalculationIf you connect it in delta connection means, the winding will get full voltage, there is no speed drop. Hence the motor draws 30% of the current to maintain the full speed.For DC Motor:The DC motor no-load current will be 25% of the full load current at the full speed (not at the base speed). henceNo load current for DC motor = 0.25 x Motor Full load current.Benefits of Finding Motor No-load current:Testing the motor with low rated testing equipment. For example, you would like to run a 50HP motor at the no-load condition at the maintenance area, then you cannot shift entire starting equipment from the service area to the maintenance area. Instead of that by calculating no-load current of the 50HP motor (it will be 6 to 10 Amps), you can design low rated starting equipment (i.e starter, cables etc) to start the motor at the maintenance floor itself.The no-load current is used to improve the winding resistance (to improve the megger value).Learn More: Muzzle Energy Calculator, Formula, Muzzle Energy CalculationNote: All the above calculation is my personal experience. Note: All the above calculations are my personal experience. Published By: Calculator Academy Last Updated: July 26, 2023 Enter the full load current (amps) and the percentage of full load current (%) into the calculator to determine the No Load Current. The following formula is used to calculate the No Load Current. Where In-L is the No Load Current (amps) FLC is the full load current (amps) R is the percentage of full load current (%)star motor = 10% delta motor = 30% dc motor = 25% To calculate the no-load current, multiply the full load current by the percentage load factor over 100. The following two example problems outline how to calculate the No Load Current. Example Problem #1: First, determine the full load current (amps). In this example, the full load current (amps) is measured to be 450. Next, determine the percentage of full load current (%). For this problem, the percentage of full load current (%) is calculated to be 52. Finally, calculate the No Load Current using the formula above: In-L = FLC * R/100 Inserting the values from above and solving the equation with the imputed values gives: In-L =450* 52/100 = 234 (amps) Example Problem #2: Using the same process as example problem 1, we first define the variables outlined by the formula. In this case, the values are: full load current (amps) = 120 percentage of full load current (%) = 42 Entering these values into the formula above gives : In-L = 120* 42/100 = 50.4 (amps) Choose the motor type, then enter the full load current of the motor. Then press the calculate button to motor get no-load current. Also, the motor rated below 3 HP the motor will take up to 40% to 60% of the full load current at the delta connection. Motor no-load current Calculations:Motor no-load current is nothing but a measuring the motor current without connecting any mechanical loads in short form shaft will be driven by hand freely. Also at no load, the power factor becomes very poor. Since motor draws high reactive current rather than the active current. Therefore, the normal current calculation formula will not help you.Let we find out the no-load calculation formulaLearn More: Rate of Work Calculator, Formula, J/s CalculationsStar Connected motor:It means the three-phase motor will be connected in star connection (one end short and another end supply). The motor will take 10% of the full load current. therefore,No load current at star connection = 0.1 x Motor Full load current.I(No-load) = 10% x I(FLA)Delta connected Motor:It means the motor will be connected as the delta. (all winding series-connected and the junction will be connected to the power supply).No load current at delta connection = 0.3 x Motor Full load current.I(No-load) = 30% x I(FLA)Look at the difference between star-connected motor and delta connected motor, do you know why this difference?If you connect the motor at star connection means, the applied voltage will be reduced, hence as the voltage is proportional to the speed of the motor. The motor will run at 60% of the full speed. While decreasing the speed along with the voltage, the motor current will be decreased and the motor draws the current to remain the same speed.Learn More: Attraction Force Calculator, Formula, AF CalculationIf you connect it in delta connection means, the winding will get full voltage, there is no speed drop. Hence the motor draws 30% of the current to maintain the full speed.For DC Motor:The DC motor no-load current will be 25% of the full load current at the full speed (not at the base speed). henceNo load current for DC motor = 0.25 x Motor Full load current.Benefits of Finding Motor No-load current:Testing the motor with low rated testing equipment. For example, you would like to run a 50HP motor at the no-load condition at the maintenance area, then you cannot shift entire starting equipment from the service area to the maintenance area. Instead of that by calculating no-load current of the 50HP motor (it will be 6 to 10 Amps), you can design low rated starting equipment (i.e starter, cables etc) to start the motor at the maintenance floor itself.The no-load current is used to improve the winding resistance (to improve the megger value).Learn More: Muzzle Energy Calculator, Formula, Muzzle Energy CalculationNote: All the above calculation is my personal experience. Note: All the above calculations are my personal experience. The current drawn by the induction motor when it is not coupled to the driven equipment is called the no-load current of the motor. The equivalent circuit of an induction motor at no load is given below.The no-load current produces the magnetic field in the motor. There are two parts of no-load current.Magnetizing component of the current(Im)Loss components(Hysteresis and eddy current loss)-IcThe no-load current(Io) is the vector sum of the magnetizing current(Im) and no-load loss components current(Iw).An induction motor draws the magnetizing current(Im) to set up the magnetic flux in the air gap. The magnetizing current is responsible for setting up air gap power in the induction motor. The loss component current(Iw) is drawn by the motor to meet the eddy current loss and hysteresis loss. The loss component current is independent of the load current, and thus, the loss component current(Iw) is constant for a particular motor. The no-load current(Io) is a fairly constant current and does not change with increased loading on the motor.If the magnetizing current of the induction motor is 5 amperes and the core loss current is 2 amperes, then no load current of the motor is ;The higher magnetizing current leads to the poor power factor of an induction motor.However, the higher magnetizing current leads to better overloading capacity of the motor. The magnetizing current of the motor increases with an increase in the number of poles of the motor. The no-load current has a prominent effect on the performance of the induction motor. Energy-efficient motors have lower no-load currents than conventional motors. The no-load current of the induction motor varies from 30 to 60 % of its full load current. Enter the values of full-load current, FLC(A) and load factor, R to determine the value of no-load current, In-L(A). No-Load Current Formula:No-load current is the electrical current that flows through an electric motor when it is running without any mechanical load attached to its shaft.This current is necessary to overcome internal losses within the motor, including friction and core losses. Although no mechanical work is being done, the motor still draws current to maintain its magnetic field and to power the internal components.Monitoring no-load current is important for assessing the health of a motor and ensuring efficient operation.Excessive no-load current can indicate issues such as bearing problems, winding short circuits, or improper motor alignment. No load current is the minimum current that flows when the device is powered but not engaged in actual work.In transformers and induction motors, the no load current primarily consists of magnetizing current needed to sustain the magnetic field in the iron core.The no-load current, In-L(A) in amperes is equal to the full-load current, FLC(A) in amperes multiplied by the load factor, R divided by 100.No-load current, In-L(A) = FLC(A) * R / 100In-L(A) = no-load current in amperes, A.FLC(A) = full-load current in amperes, A.R = load factor in percentage.No-Load Current Calculation:Calculate the no-load current for a motor with a full-load current of 10 amperes and a load factor of 5:Given: FLC(A) = 10A, R = 5.No-load current, In-L(A) = FLC(A) * R / 100In-L(A) = 10 * 5 / 100In-L(A) = 0.5A.Determine the full-load current, if the no-load current is 0.8 amperes and the load factor is 4:Given: In-L(A) = 0.8A, R = 4.No-load current, In-L(A) = FLC(A) * R / 100FLC(A) = In-L(A) * 100 / RFLC(A) = 0.8 * 100 / 4FLC(A) = 20A. Calculating no-load current is essential for understanding the efficiency and operational performance of various types of motors and electrical systems. This measurement can significantly impact energy consumption and the lifespan of electrical equipment.Historical BackgroundThe concept of no-load current is crucial in electrical engineering, providing insights into the behavior of motors and transformers when they operate without mechanical load. It reflects the current drawn by the machine solely to maintain its magnetic field, with no external work being done.Calculation FormulaThe formula to calculate the no-load current is given by:\[\text{In-L} = \frac{\text{FLC} \times R}{100}\]where:\(\text{In-L}\) is the No Load Current in amps,\(\text{FLC}\) is the Full Load Current in amps,\(R\) is the Percentage of Full Load Current.Example CalculationGiven a full load current of 450 amps and a percentage of full load current of 52%, the no-load current would be:\[\text{In-L} = \frac{450 \times 52}{100} = 234 \text{ amps}\]For a different scenario with a full load current of 120 amps and a percentage of full load current of 42%, the calculation yields:\[\text{In-L} = \frac{120 \times 42}{100} = 50.4 \text{ amps}\]Importance and Usage ScenariosNo-load current analysis is vital for designing and selecting motors and transformers to ensure they operate efficiently under various load conditions. It helps in assessing power losses, improving designs, and reducing operational costs.Common FAQsWhat is no-load current?No-load current is the current drawn by an electric motor or transformer when operating without any mechanical load. It is essential for maintaining the magnetic field in the device.How does no-load current affect efficiency?Higher no-load currents indicate inefficiencies, as more energy is consumed without performing any mechanical work. Reducing no-load current can significantly improve energy efficiency.Can no-load current be used to diagnose equipment issues?Yes, comparing actual no-load current measurements to expected values can help identify issues such as winding faults or magnetic core problems in electrical equipment.Understanding and calculating no-load current is crucial for optimizing electrical systems for better performance and efficiency. Rule of thumb is... no rules of thumb, or at least no particularly accurate ones. Doesn't sound outrageously high - don't forget that this is almost all reactive current at 90 to the voltage so it isn't doing any useful work. It is the magnetising current for the iron in the motor, plus a bit of in-phase current to provide the power consumed as windage and I2R losses. ---------- If we learn from our mistakes I'm getting a great education! That's good information. Write it down somewhere so you can find it later. Scotty's correct. Our motor shop used to do a no-load test on motors before they went out the door. but at "no load" the small increase in current caused by for instance, a bad bearing is going to be lost in the larger component of the magnetizing current. Still, having a no-load current record has strengthened my position a few times in the age-old "It's not my process equipment, it's YOUR electric motor" arguments.old field guy With a no load current of 233A power factor of 84.5 I would expect a no load current of over 120 Amps.With a no load current of 90 Amps and a full load current of 233 Amps I would expect a power factor of over 0.9Given that other motors are showing low current, have you checked your meter lately?How is the voltage at the motor, loaded and unloaded? Bill----------"Why not the best?"Jimmy Carter From my experience, I can say that no-load current for 4-pole motor 200 HP, 480 V, 60 Hz should be approximately 60-65 A, if the motor is intended for permanent work. I must say that there are no strict rules and that it varies with different manufacturers, usually at low power motors.The reason for the increased value of the no-load currents can be:1 - motor is provided by the manufacturer for a short overload and therefore must have increased value of no-load current or2 - if the motor was already on the repair, the cause may be some changes in the windings (turns, pitch, connections etc) or improperly motor-heating in the process of removing the old windings.Zlatkodo I have seen no-load cuurents as high as 80% of FLA's in ny repair shop. It doesn't seem that high in your case. However, if you are comparing the identical (similar doesn't cut it) motors from the same OEM, then it's a cause for concern. Is this an original winding or a rewind ? Muthu First approximation: We consider simple model neglecting leakage reactances. Then we have a magnetizing branch in parallel with a load branch. The current in the load branch is PF*FLA=197AThe current in the magnetizing branch is (1-PF^2)*FLA=66.6AUnder this model, no-load current would be 66.6A. What happens if you refined the model to include leakage reactance.... then the leakage reactance would consume vars at full load but not as much at no-load, so I think the no-load current would be even lower than predicted above. Something sounds out of whack to me. ==========Eng-tips forums: The best place on the web for engineering discussions. If we use FLA as a starting point, then magnetizing current is FLA*sqrt(1-PF^2), which is 233*.535 = 125 A. Then, a 480 V grid usually means a 460 V motor. That could change things, but not much (a few percents). Your 90 A no load seems OK, a little low, but not to worry about. As Bill says; checked your meters lately? Gunnar Englund----------100 % recycled posting: Electrons, ideas, finger-tips have been used over and over again... I was just coming back to add that sqrt which I left out in earlier calc. Gunnar beat me to it. ==========Eng-tips forums: The best place on the web for engineering discussions. Another thing I had mentioned before - this approach is based on a model neglecting leakage reactances. i.e. it assumes the vars remain the same at full load and no load, but there are actually some vars present at full load that are not present or reduced at no-load (rotor leakage reactance is present at full load and elimianted at no-load... stator leakage reactance VARS are reduced going from full load to no-load). Using typical values of leakage reactance maybe 0.08 - 2 pu on both rotor and stator, one could estimate no-load current. I suspect it won't bring the estimate down enogh to explain this reading, but might partial explain it (along with voltage... what was your voltage?). I might do that calculation later if I have a chance... gotta run now. ==========Eng-tips forums: The best place on the web for engineering discussions. The motor in question is a brand new origonal motor. So what I gather from this, is that a good aproximation for estimating no-load current (which is bascially all magnetizing current)is to calculate the magnetizing at full load current with the full load power factor, and use this vaule as the magnetising current for the full range of the motor ingoring any leakage reactance which will be minimal. Is measuing the no-load current a good tool in trying to decide weather weather a high current situation is a result of a load issue or a motor issue? Or will bearing problems and other problems with a motor not have a signifigant enough impact and to show an increased current in such cases as mentioned above?The one thing that I dont understand is that I have a similar 200hp motor with an almost identical effeciency, and p.f. and this motor datasheet shows a no-load current of only 60A. I am waiting to get my hands on the datasheet for the motor that I am referencing to see what it states, but in the mean time I am puzzled as to what would cause such a difference? The magnetizing component of the current is constant from no-load to full load. If it is a brand new motor, what does the test certificate say ? Muthu Here is an example of a hypothetical 200 HP motor to illustrate the difficulty of trying to check for bad bearings by monitoring no oad current.Suppose the magnetizing current is 100 amps. Suppose the windage and bearing load is about 8 or 9 HP. The real current component of this load will be about 10 amps.This 10 amps is acting at right angles to the magnetizing current. Pythagoras tells us that the resultant current will be the root of the sum of the squares, or 100.5 Amps. Most of this load will be windage but suppose that a bad bearing doubles the load. That implies about 8 or 9 HP being dissipated in a bad bearing. That is about 6 kW being wasted in a dragging bearing. A catastrophic ailure may occur in minutes. This is a far far worse case of bearing failure than the early stages of failure we want to detect to avoid an unplanned outage.But what will this do to our no load current?We will still have 100 Amps of magnetizing current but our real component of current has risen from 10 Amps to 20 Amps.The sum of the squares gives us 102 amps. 6 kW disipated in a bad bearing has caused an increase in the line current from 100.5 Amps to 102 Amps. A rise of only 1.5% in current. And a bearing would most likely fail long before the drag started wasting 6 kW.Forget current. Check bearing health with vibration trending and temperature trending. Bill----------"Why not the best?"Jimmy Carter Absolutely right. But, there is a simple way to check for active current, use a meter that shows kW instead of A. Gunnar Englund----------100 % recycled posting: Electrons, ideas, finger-tips have been used over and over again... I agree looking at no-load current is not a good way to find a problem with a bearing. So what I gather from this, is that a good aproximation for estimating no-load current (which is bascially all magnetizing current)is to calculate the magnetizing at full load current with the full load power factor, and use this vaule as the magnetising current for the full range of the motor ingoring any leakage reactance which will be minimal. I agree it is reasonably good. We also know the direction of the error (in calculating no-load current from full load current/power factor)...when we neglect leakage reactance the result will be higher than the actual no-load current predicted by the full equivalent circuit because there are vars "consumed" in the leakage reactance elements at full load that are reduced (stator leakage reactance) or eliminated (rotor leakage reactance) at no load. I will try to do solme example calc sometime this weekend to check how significant is the difference. ==========Eng-tips forums: The best place on the web for engineering discussions. Good point, Gunnar. Bill----------"Why not the best?"Jimmy Carter There really is no good rule of thumb - you could estimate about 30% of FLA for a ballpark figure but motors can vary all over the place. I have seen small motors draw around 80% of FLA at no load and large motors draw > X1 and Xm>>X2. If you work through the thevinin equivalent circuit with any of the leakage impedances moved to either side of the equivalent circuit, and then simplify the results using Xm>>X2, you will always end up with the same thevinin circuit which has Voc ~ VsIsc ~ Vs/(X1+X2)Rth = Voc/Isc Since X1 and X2 appear only as a sum and not individually, it doesn't matter what their ratio is... only what their sum is.... we could lump all the total leakage reactance in either one (X1 or X2) and the thevinin circuit characteristics would not change much (based on the fact that Xm is so much larger than either one). This observation helps simplify the vector diagram for the Ossanna diagram, but also tells us the assumtion X2/X1 is not critical. X1/Xm is more of a critical assumption because it gets directly at the subject we have been talking about, and it has a dramatic effect on the computed no-load current in this problem. I noticed if you put the target at 0.1 or 0.2, the program still wants to drag it down to 0.05. If you put the target down below 0.5 the program drags the solution toward non-credible results. I think the ratio 0.05 is a credible ratio based on looking at similar size motors and certainly the design presented above is a very plausible equivalent circuit model of the motor from no load to full load (there may be others). Using the above equivalent circuit parameters, we can quickly calculate the no-load current as NLA = VLN / (Xm + X1) = 277 / (3.66270788 + 0.179466053) = 69.1 Ampsif you add in the R_NL portion, it is 69.5 amps... not an important detail. The bottom line, 70A would be my best prediction from the nameplate data you gave, and with a slightly different specified X1/XL it can easily change to 60A. I don't see any reason to suspect your measurement. This is just one approach to the problem of estimating no-load currents from nameplate data. It may seem like overkill, but it's easy once you get the hang of the spreadsheet (that can be used for many many different tasks besides this). A little bit of vector thinking will probably give more insight into the behavior along the lines of the diagram linked by Gunnar. ==========Eng-tips forums: The best place on the web for engineering discussions. Correction in bold:"X1/Xm is more of a critical assumption because it gets directly at the subject we have been talking about, and it has a dramatic effect on the computed no-load current in this problem. I noticed if you put the target at 0.1 or 0.2, the program still wants to drag it down to 0.05. If you put the target down below 0.05 the program drags the solution toward non-credible results" ==========Eng-tips forums: The best place on the web for engineering discussions. Choose the motor type, then enter the full load current of the motor. Then press the calculate button to motor get no-load current. Also, the motor rated below 3 HP the motor will take up to 40% to 60% of the full load current at the delta connection. Motor no-load current Calculations:Motor no-load current is nothing but a measuring the motor current without connecting any mechanical loads in short form shaft will be driven by hand freely. Also at no load, the power factor becomes very poor. Since motor draws high reactive current rather than the active current. Therefore, the normal current calculation formula will not help you.Let we find out the no-load calculation formulaLearn More: Rate of Work Calculator, Formula, J/s CalculationsStar Connected motor:It means the three-phase motor will be connected in star connection (one end short and another end supply). The motor will take 10% of the full load current. therefore,No load current at star connection = 0.1 x Motor Full load current.I(No-load) = 10% x I(FLA)Delta connected Motor:It means the motor will be connected as the delta. (all winding series-connected and the junction will be connected to the power supply).No load current at delta connection = 0.3 x Motor Full load current.I(No-load) = 30% x I(FLA)Look at the difference between star-connected motor and delta connected motor, do you know why this difference?If you connect the motor at star connection means, the applied voltage will be reduced, hence as the voltage is proportional to the speed of the motor. The motor will run at 60% of the full speed. While decreasing the speed along with the voltage, the motor current will be decreased and the motor draws the current to remain the same speed.Learn More: Attraction Force Calculator, Formula, AF CalculationIf you connect it in delta connection means, the winding will get full voltage, there is no speed drop. Hence the motor draws 30% of the current to maintain the full speed.For DC Motor:The DC motor no-load current will be 25% of the full load current at the full speed (not at the base speed). henceNo load current for DC motor = 0.25 x Motor Full load current.Benefits of Finding Motor No-load current:Testing the motor with low rated testing equipment. For example, you would like to run a 50HP motor at the no-load condition at the maintenance area, then you cannot shift entire starting equipment from the service area to the maintenance area. Instead of that by calculating no-load current of the 50HP motor (it will be 6 to 10 Amps), you can design low rated starting equipment (i.e starter, cables etc) to start the motor at the maintenance floor itself.The no-load current is used to improve the winding resistance (to improve the megger value).Learn More: Muzzle Energy Calculator, Formula, Muzzle Energy CalculationNote: All the above calculation is my personal experience. Note: All the above calculations are my personal experience. Ever wondered how much electricity a motor pulls when its just running but doing no real work? Thats called no-load current, and knowing it can save you time, energy, and even money. A No-Load Current Calculator helps you figure that out quickly and accurately.This simple tool is often used by electricians, technicians, engineers, and students to check how much current a motor uses when it's not connected to any load just spinning freely. READ ALSO : Voltage Imbalance Calculator What Is a No-Load Current Calculator?A No-Load Current Calculator helps estimate the current (in Amperes) drawn by an electric motor when its running without a load that is, not turning any machinery, fans, or wheels.Even when idle, motors consume some power just to overcome internal friction, magnetizing the core, or running bearings. This current is called no-load current, and its important because: It helps check if a motor is working normallyIt shows whether the motor is drawing too much or too little power when idleIt helps in energy audits and troubleshootingInstead of doing long manual calculations, this calculator gives you the answer in seconds.Basic Formula & Variables Formula:I = P / (3 V cos())This is the standard formula for 3-phase motors, where power, voltage, and power factor are known. Variables Explained Simply VariableExplanationINo-load current (in Amps)PPower input at no load (in Watts)VLine voltage supplied to the motorcos()Power factor of the motor (usually between 0.7 to 0.9)Example:If a motor consumes 600 W of power at no load, is supplied with 400 V, and has a power factor of 0.85, the no-load current would be:I = 600 / (3 400 0.85) 1.02 AWhere This Calculator Comes in HandyUsed in Electrical Motor TestingMotor testers and field engineers use this to compare actual vs expected no-load currentHelps detect internal faults, bearing issues, or abnormal energy lossUseful for verifying new installations or checking old motorsREAD ALSO : Tap Voltage CalculatorUsed in Power Saving and Efficiency ChecksNo-load current is part of energy auditingHelps industries check which motors are wasting energyIdentifies motors that are running too long without load and burning extra electricityUsed in Manufacturing and Repair WorkTechnicians use it after repairs to confirm the motor is healthyIt tells whether the motor is running too hot or drawing too much idle powerAlso used when setting up automated machinery for safety checksTips for Better Accuracy Make sure to measure voltage and power precisely Use the correct power factor (if unknown, check motor nameplate or manufacturer specs) Always run motor without any mechanical load connected Use the calculator before and after servicing for best resultsThings to Avoid Dont guess the power factor it affects results a lot Dont run the calculator while motor is loaded results will be wrong Dont forget to check for 1-phase vs 3-phase formulas differ Dont rely only on readings use tools like clamp meters for real-time validationREAD ALSO : Line Current CalculatorFAQs:1. What is no-load current?Its the current a motor draws when running without doing any mechanical work just spinning freely.2. Why is it important to calculate it?Because it tells you how efficient or healthy your motor is when idle. High no-load current could signal a problem.3. Whats a normal range for no-load current?Usually 2040% of full-load current, depending on motor size and type.4. Can this calculator be used for single-phase motors?Yes, but the formula changes slightly. This one is best for 3-phase motors.5. Does power factor matter a lot?Yes it directly affects the result. Always use a reliable value.6. Can I use this for other machines, like compressors or fans?If they have electric motors, yes but make sure they're running idle (no load).Conclusion:The No-Load Current Calculator is more than just a technical tool its a smart way to understand your motor's behavior when its doing nothing. Knowing how much current your motor draws when idle helps you detect early issues, improve energy use, and maintain equipment safely.Whether you're fixing a fan, testing a motor, or doing an energy audit, this calculator gives you a quick, clear answer no confusion, no guesswork. Danny This is a good indication that the motor is being overloaded. Ifthe motor load is belt driven, remove the belt and then check themotor amps. If it goes back to normal FLA then there is a problemwith the driven load. If the motor amperage stays high check themotor bearings for the problem. 26 Jan 2024 Tags: Electrical Engineering Electrical Machines General No-Load and Blocked Rotor Test Calculations Popularity: This calculator provides the calculation of No-Load and Blocked Rotor Test for Electrical Engineering applications. Explanation Calculation Example: The No-Load and Blocked Rotor Tests are two important tests that are used to measure the performance of an electric motor. The No-Load Test is performed by running the motor at no load and measuring the current, voltage, and power factor. The Blocked Rotor Test is performed by blocking the rotor from rotating and measuring the current, voltage, and power factor. Q: What is the purpose of the No-Load Test? A: The No-Load Test is used to measure the no-load current, voltage, and power factor of an electric motor. This information can be used to determine the efficiency of the motor and to identify any problems with the motor. Q: What is the purpose of the Blocked Rotor Test? A: The Blocked Rotor Test is used to measure the locked rotor current, voltage, and power factor of an electric motor. This information can be used to determine the starting torque of the motor and to identify any problems with the motor. Variables | | - | - | Calculation Expression Apparent Power: Apparent power = V * I True Power: True power = V * I * PF Reactive Power: Reactive power = V * I * (1 - PF) Impedance: Impedance = V / I Power Factor Angle: Power factor = cos(?) Calculated values Considering these as variable values: R=44.0, V=220.0, PF=0.8, I=5.0, the calculated value(s) are given in table below | | - | Power Factor Angle Tan(?) Sensitivity Analysis Graphs Apparent Power: Apparent power = V * I Impact of Applied Voltage on Apparent Power V = [-1099778.405 TO 1100216.158] f(V)=V * I Impact of Measured Current on Apparent Power I = [-1099997.426 TO 1100000.888] f(I)=V * I Similar Calculators Explore Electrical Machines Power Systems Electrical Measurements Calculator Apps Gear Design in 3D & Learning Matching 3D parts for No-Load and Blocked Rotor Test Calculations calculation for Electrical Engineering App in action The video below shows the app in action. Choose the motor type, then enter the full load current of the motor. Then press the calculate button to motor get no-load current. Also, the motor rated below 3 HP the motor will take up to 40% to 60% of the full load current at the delta connection. Motor no-load current Calculations:Motor no-load current is nothing but a measuring the motor current without connecting any mechanical loads in short form shaft will be driven by hand freely. Also at no load, the power factor becomes very poor. Since motor draws high reactive current rather than the active current. Therefore, the normal current calculation formula will not help you.Let we find out the no-load calculation formulaLearn More: Rate of Work Calculator, Formula, J/s CalculationsStar Connected motor:It means the three-phase motor will be connected in star connection (one end short and another end supply). The motor will take 10% of the full load current. therefore,No load current at star connection = 0.1 x Motor Full load current.I(No-load) = 10% x I(FLA)Delta connected Motor:It means the motor will be connected as the delta. (all winding series-connected and the junction will be connected to the power supply).No load current at delta connection = 0.3 x Motor Full load current.I(No-load) = 30% x I(FLA)Look at the difference between star-connected motor and delta connected motor, do you know why this difference?If you connect the motor at star connection means, the applied voltage will be reduced, hence as the voltage is proportional to the speed of the motor. The motor will run at 60% of the full speed. While decreasing the speed along with the voltage, the motor current will be decreased and the motor draws the current to remain the same speed.Learn More: Attraction Force Calculator, Formula, AF CalculationIf you connect it in delta connection means, the winding will get full voltage, there is no speed drop. Hence the motor draws 30% of the current to maintain the full speed.For DC Motor:The DC motor no-load current will be 25% of the full load current at the full speed (not at the base speed). henceNo load current for DC motor = 0.25 x Motor Full load current.Benefits of Finding Motor No-load current:Testing the motor with low rated testing equipment. For example, you would like to run a 50HP motor at the no-load condition at the maintenance area, then you cannot shift entire starting equipment from the service area to the maintenance area. Instead of that by calculating no-load current of the 50HP motor (it will be 6 to 10 Amps), you can design low rated starting equipment (i.e starter, cables etc) to start the motor at the maintenance floor itself.The no-load current is used to improve the winding resistance (to improve the megger value).Learn More: Muzzle Energy Calculator, Formula, Muzzle Energy CalculationNote: All the above calculation is my personal experience. Note: All the above calculations are my personal experience. Choose the motor type, then enter the full load current of the motor. Then press the calculate button to motor get no-load current. Also, the motor rated below 3 HP the motor will take up to 40% to 60% of the full load current at the delta connection. Motor no-load current Calculations:Motor no-load current is nothing but a measuring the motor current without connecting any mechanical loads in short form shaft will be driven by hand freely. Also at no load, the power factor becomes very poor. Since motor draws high reactive current rather than the active current. Therefore, the normal current calculation formula will not help you.Let we find out the no-load calculation formulaLearn More: Rate of Work Calculator, Formula, J/s CalculationsStar Connected motor:It means the three-phase motor will be connected in star connection (one end short and another end supply). The motor will take 10% of the full load current. therefore,No load current at star connection = 0.1 x Motor Full load current.I(No-load) = 10% x I(FLA)Delta connected Motor:It means the motor will be connected as the delta. (all winding series-connected and the junction will be connected to the power supply).No load current at delta connection = 0.3 x Motor Full load current.I(No-load) = 30% x I(FLA)Look at the difference between star-connected motor and delta connected motor, do you know why this difference?If you connect the motor at star connection means, the applied voltage will be reduced, hence as the voltage is proportional to the speed of the motor. The motor will run at 60% of the full speed. While decreasing the speed along with the voltage, the motor current will be decreased and the motor draws the current to remain the same speed.Learn More: Attraction Force Calculator, Formula, AF CalculationIf you connect it in delta connection means, the winding will get full voltage, there is no speed drop. Hence the motor draws 30% of the current to maintain the full speed.For DC Motor:The DC motor no-load current will be 25% of the full load current at the full speed (not at the base speed). henceNo load current for DC motor = 0.25 x Motor Full load current.Benefits of Finding Motor No-load current:Testing the motor with low rated testing equipment. For example, you would like to run a 50HP motor at the no-load condition at the maintenance area, then you cannot shift entire starting equipment from the service area to the maintenance area. Instead of that by calculating no-load current of the 50HP motor (it will be 6 to 10 Amps), you can design low rated starting equipment (i.e starter, cables etc) to start the motor at the maintenance floor itself.The no-load current is used to improve the winding resistance (to improve the megger value).Learn More: Muzzle Energy Calculator, Formula, Muzzle Energy CalculationNote: All the above calculation is my personal experience. Note: All the above calculations are my personal experience. Choose the motor type, then enter the full load current of the motor. Then press the calculate button to motor get no-load current. Also, the motor rated below 3 HP the motor will take up to 40% to 60% of the full load current at the delta connection. Motor no-load current Calculations:Motor no-load current is nothing but a measuring the motor current without connecting any mechanical loads in short form shaft will be driven by hand freely. Also at no load, the power factor becomes very poor. Since motor draws high reactive current rather than the active current. Therefore, the normal current calculation formula will not help you.Let we find out the no-load calculation formulaLearn More: Rate of Work Calculator, Formula, J/s CalculationsStar Connected motor:It means the three-phase motor will be connected in star connection (one end short and another end supply). The motor will take 10% of the full load current. therefore,No load current at star connection = 0.1 x Motor Full load current.I(No-load) = 10% x I(FLA)Delta connected Motor:It means the motor will be connected as the delta. (all winding series-connected and the junction will be connected to the power supply).No load current at delta connection = 0.3 x Motor Full load current.I(No-load) = 30% x I(FLA)Look at the difference between star-connected motor and delta connected motor, do you know why this difference?If you connect the motor at star connection means, the applied voltage will be reduced, hence as the voltage is proportional to the speed of the motor. The motor will run at 60% of the full speed. While decreasing the speed along with the voltage, the motor current will be decreased and the motor draws the current to remain the same speed.Learn More: Attraction Force Calculator, Formula, AF CalculationIf you connect it in delta connection means, the winding will get full voltage, there is no speed drop. Hence the motor draws 30% of the current to maintain the full speed.For DC Motor:The DC motor no-load current will be 25% of the full load current at the full speed (not at the base speed). henceNo load current for DC motor = 0.25 x Motor Full load current.Benefits of Finding Motor No-load current:Testing the motor with low rated testing equipment. For example, you would like to run a 50HP motor at the no-load condition at the maintenance area, then you cannot shift entire starting equipment from the service area to the maintenance area. Instead of that by calculating no-load current of the 50HP motor (it will be 6 to 10 Amps), you can design low rated starting equipment (i.e starter, cables etc) to start the motor at the maintenance floor itself.The no-load current is used to improve the winding resistance (to improve the megger value).Learn More: Muzzle Energy Calculator, Formula, Muzzle Energy CalculationNote: All the above calculation is my personal experience. Note: All the above calculations are my personal experience.

Motor no load current calculation formula. What is no load current of motor. Motor no load current chart. No load current of induction motor. 3 phase motor no load current calculation.