

How to calculate generator load for your 30-minute monthly test

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NFPA 110, 2010 edition, chapter 8.4.2

All generators must be exercised every month for 30 minutes under load. That means all transfer switches have to be transferred to the generator.

Gas systems may be tested using whatever building load is available after you have transferred all transfer switches. You do not need to calculate 30% load for natural gas or LPG powered systems.

Diesel systems need to reach 30% of rated load.



Some control panels are capable of reading percentage of load. If that is the case it is easy.

Since generator control panels are not standardized, you will need to refer to your generator's owners' manual for specific instructions on how to read percentage of load.

Cummins provides a tutorial on YouTube at <https://youtu.be/fdVTRLMA7st>. You can copy the link from my notes below this video. This Cummins technician addresses operation of the control panel between 5:13 and 10 minutes on his video. Other control panel displays will be similar.

However, all generator control panels should be capable of displaying amperage.

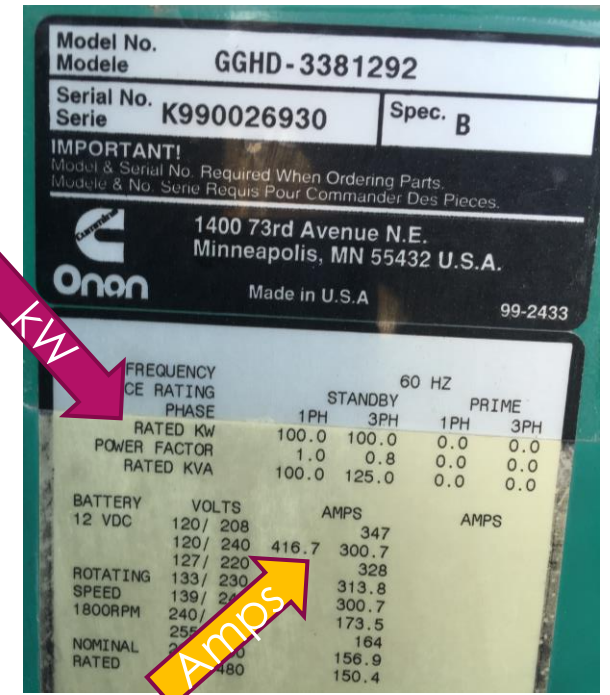
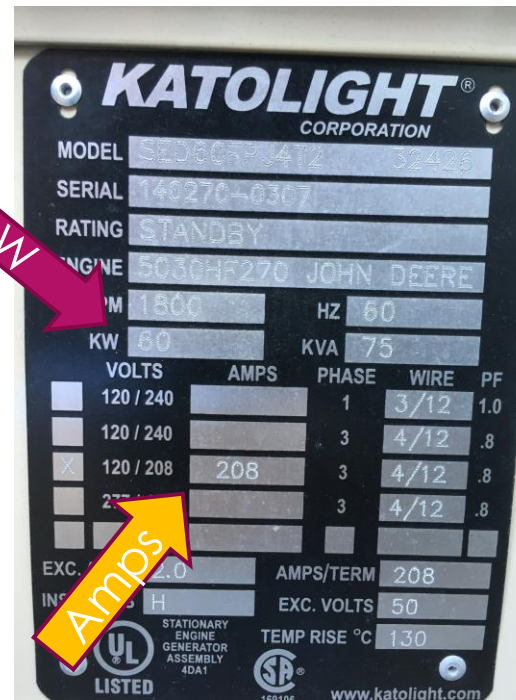
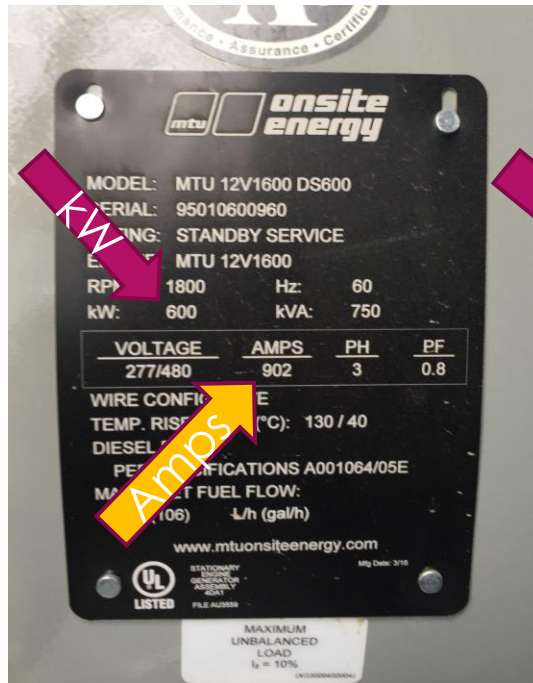
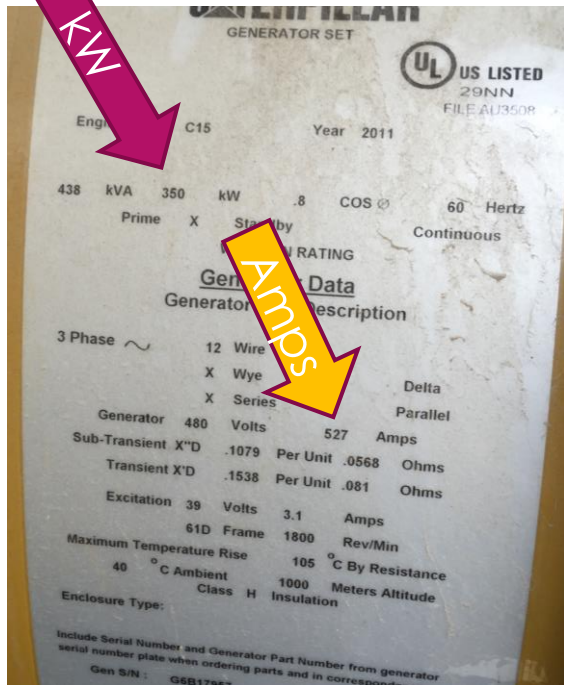


In order to determine 30 percent of load you need to know the maximum rating of your generator.

To see what the maximum rating is, go to the generator's nameplate. This will tell you what the generator's capacity is in amperes and kW. Ignore KVA.

See examples below. You will need to know your generator output voltage.

The NFPA 110, 2010 edition, chapter 8.4.2.3, specifically says "... nameplate kW rating..."



Amperage is a measurement of the work the generator is doing. Because of this, the generator must be running, and all transfer switches transferred in order to get a reading.

With some systems, the load is too low for the ammeter to measure. As a result, even with all transfer switches transferred, the load may be below the minimum threshold for the meter to read.

In order to determine the 30% load target you need to reach with diesel generators, simply multiply the amperage taken from the nameplate times .3

For example:

If you have a 100kW generator producing 240 volts 3 phase (see the nameplate on the far right from the last slide) the rated amperage is **300.7 amps**. That value times .3 equals 90.21 amps.

So, if you reach at least 90.21 amps on your ammeter, you have achieved your 30% minimum.



Of course there is always one other thing.

Read each leg individually and record the value. Then average.

Say your 30% target is 90.21 amps and, when you switch the selector switch, you read L1--120 amps, L2--85 amps, and L3--70 amps (examples). Add them up. 120 plus 85 plus 70 equals 275 amps. Then divide by 3 to get 91.66 amps average for that test. Your average is over the minimum 90.21 amps. You have achieved the minimum 30% load.



All three legs do not have to be over the 30% target so long as the average reading meets or exceeds 30%.



I have taken a couple of exceptions here.

But, like I said, I'm expressing my opinion.

- It is easier to express the percentage of load in **amperage** because all generators will give you an amperage reading, even though the code says kW.
NFPA 110, 2010 edition, chapter 8.4.2 (2)

Many generators do not express load in kW.

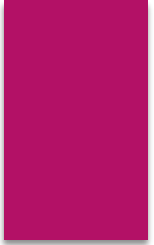
Most surveyors will accept percentage load expressed in amperage.

- In addition, the code does not specifically allow you to average your readings, but it does not specifically prohibit it.

In any case, always follow your surveyor's direction.

If you need further help, you can e-mail questions to me at my address noted below this video.





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