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PowerHour FAQs

Understanding ISO 8528 Generator Set Ratings

One of the first steps when selecting the appropriate generator set for an application includes identifying the applicable generator set rating. This course will provide an overview of the industry standards that define generator set ratings, such as ISO 8528-1, while providing guidance and examples of how to select the rating most appropriate for a specific application. Ratings that extend beyond ISO 8528, such as ratings defined for data center usage, will also be explored.

To learn more about ISO 8528, please join the Cummins PowerHour webinar:

Following this PowerHour participants should be able to:

- Describe generator set ratings definitions per ISO 8528-1
- Identify appropriate usage of ISO 8528-1 for various applications
- Recognize non-ISO 8528 ratings and their appropriate usage

Do Cummins generator sets have Uptime Institute certification for data centers?

The Uptime Institute doesn't certify specific brands or models of generator sets as such. The Uptime Institute lists the criteria for each Tier rating; it's up to the manufacturer to demonstrate to their customer that the generator set meets Uptime's requirements. However, there are various generator set manufacturers who provide ratings that may be preapproved by Uptime or manufacturers that have worked with the Uptime Institute to develop those ratings.

The key factors for meeting Uptime's requirements are:

- Constant load
- No limitation on run hours
- No limitation on average load factor
- No requirement for reliable utility service

Please explain exactly what kWe means.

The term kWe is typically used to designate kilowatts electrical versus kilowatts mechanical. This term helps differentiate the engine power versus the actual electrical output of the generator set.

At what point does a change in altitude begin to affect fuel consumption?

The significant factor is the change in air density. As air density decreases, it is harder for the engine to produce full power. So, there's a certain point where the air density has decreased to the extent that the engine can't force enough air mass into the cylinders to maintain the power level. Therefore, air density affects fuel consumption. However, you are typically going to see a bigger impact on the output of the generator before that occurs.

What alterations are required to have a generator set fully rated for single-phased output?

Typically what we're seeing many generator set manufacturers do to achieve full output from a generator set in a single-phase configuration is oversizing the alternator to accommodate the single-phased loads.

Generator sets classified by ISO 8528 as ESP (emergency standby power) or PRP (prime power) are required to meet a 70% average load factor. Does this percentage vary by manufacturer or model?

ISO's expectation is that the minimum average load factor is 70%. So manufacturers can, in some cases, demonstrate higher average load factor ratings. And that's where it's important to understand that although ISO sets the standard, different manufacturers may go above and beyond. It's best to work closely with the

generator set manufacturers and suppliers who you're considering, to understand what it is specifically that they offer on their products, what they'll warranty and how that compares to the other generator sets on the market.

Are you expecting any changes in EPA emissions regulations? Are owners being less proactive about going to Tier 4 Final because they are anticipating regulatory relief?

I haven't heard any discussion about the possibility of regulatory relief in the near future. Today for compression ignition all non-emergency, non-emergency stationary, and non-road are Tier 4 certified.

There have been some changes in Tier 4 Final. One of the things that we did see recently was the addition of inducement mitigation in order to bypass inducement for emergency operations and emergency applications. However, as far as major changes in the regulations, I don't see that on the horizon.

How does a lower temperature rise alternator correlate with motor start capability?

A 150°C rated alternator will allow you to pull, say, 2500 kW. The same alternator at 80°C will only pull 1900 kW. If you need 2500 kW and the lower temperature rating, you can't use that alternator, you have to choose a bigger alternator. I wouldn't say there's a causal link between the alternator temperature rise and motor starting capability, but when you specify a lower temperature rise you may be inadvertently driving up the size of the alternator, which in turn may impact other factors such as motor starting capability. So generally speaking, a lower temperature rise will more than likely yield increased motor starting capability, but it's an indirect link.

Are the ISO ratings tested or theoretical?

It's important to work with the generator set manufacturer to understand how they perform testing. NFPA's encourages generator set manufacturers to do prototype testing. Most manufacturers will test the ratings to ensure that the generator will perform as expected in the field. So you should request a prototype test certificate or prototype test summary so you can understand exactly what has been tested. You need to know what the manufacturer has done to make sure the product is going to work for you.

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