Compressor Speed Control - Q&A

What is it; do I need it; and what are the options?

Q: What is compressor speed control?

A: The Danfoss compressors that Frigoboat uses in their refrigeration systems have variable speed capability.

> ***Fact 1:*** *The longer and slower the compressor runs, the more efficient it is, and the faster the compressor runs the more cooling power it has.*

So ideally, we want to run the compressor at the fastest speed initially to cool the box down and then run it as slow as possible to maintain temperatures. Then there should be provision for the speed to be adjusted manually or automatically when warm goods are put in the box and/or when external conditions change.

> ***Fact 2:*** *The highest loading on the electronics, and therefore the highest risk of failure, happens during the first few minutes of start-up with a warm box and with the compressor running at maximum speed.*

As a safeguard against electronic failure from overloading, we should therefore start the compressor in a slower speed, where there is less strain on the electronics, and then gradually increase it to maximum.

Q: Do I need it?

A: No, you don't *need* it, but it makes the system far more efficient as well as providing much-needed protection for the electronics.

> ***NOTE:*** *Pumped-water cooled systems and those using holding plates should be set to run only at maximum speed.*

Q: What are the options?

(1) ***Fixed speed***: Speed set at lowest speed (2000 RPM). Non-adjustable. Standard on Frigoboat's smallest capacity system.

(2) ***Variable speed board, manually adjusted***: User-adjustable speed selection from 2000 RPM to 3500 RPM. Standard on most Frigoboat systems.

(3) ***Merlin II Smart speed controller***: Speed adjusted automatically to achieve roughly 30 minute compressor run time. Ramp-start from mid-speed on start-up for electronic protection. No remote panel, but instead is a speed board mounted on compressor. Option on all Frigoboat Systems.

