

Information on Electronic Unit 101N0500

AC Voltage in Combination with 24V DC Power Supply Voltage

Danfoss would like to inform you about the behaviour of the AC/DC electronic unit when applying DC and AC voltage to the unit at the same time. The following applies only to 24V DC powered systems. 12V DC systems will never cause the behaviour as described below.

As stated in the instruction sheet of the 101N0500 electronic unit, the AC voltage will always have priority over the DC voltage. This is, however, not correct in all situations. In cases where AC voltage and DC voltage above 27V DC are applied to the controller, the DC power supply will take over the supply.

The speed of the BD compressor is proportional with the voltage of the compressor motor. The compressor motor is designed to run between 2000 and 3500 rpm.

In order to decrease power leakage, the current to the compressor is reduced by increasing the voltage applied to the compressor motor. For this purpose, there is a boost converter in the electronic unit that is able to step up the applied voltage to a voltage between 27 and 45V DC.

That means if 2000 rpm is requested, the voltage out of the boost converter is 27V DC and if 3500 rpm is requested, the voltage out of the boost converter is 45V DC.

The internal AC/DC converter will always deliver 27V DC to the boost converter for the motor voltage. We have chosen this voltage as it is the voltage which is requested for running the compressor with the minimum speed of 2000 rpm. The boost converter can only step the voltage up, but not down.

When a voltage of 27V DC is applied on the input of the boost converter, we will have an amplification of 1:1. If we had chosen to set this voltage from the AC/DC converter higher we would no longer have been able to run the compressor with the minimum speed of 2000 rpm and that would have decreased the functionality of the compressor.

This means for our customers that when applying higher voltage than 27V DC to the DC input of the controller the voltage from the DC will be higher than the output from the internal AC/DC converter. Consequently, the DC input will be recognized as active and therefore the controller will draw the power from the DC power source.

We do not see this behaviour as something that could cause problems in an application.

Please get in touch with your Danfoss contact if any further information is needed.

Please also visit our Web site: compressors.danfoss.com and have a look at our complete product range, news, and literature covering all your present and future applications.

