Purpose:

To clarify the interpretation of the specification for the Maximum Incoming Line Voltage for 3 phase power systems published in the SAC-S and SAC-D/DE Series AC Servodrive Installation and Operation Manuals (SAC-S01d and SAC-D01a).

*Failure to take the points listed below into account when designing your servodrive incoming AC power system may result in premature drive failure.*

SAC-DE Series Servodrives are designed for 115 VAC or 230 VAC single phase AC power. As a result many of the points listed below will not apply.

Description:

The above referenced manuals include the following specifications for 3 phase Incoming Line Voltage:

SAC-S and SAC-D Series - (3 phase power)

Incoming Line Voltage: 200-230 VAC
3 phase, 50/60 Hz

Minimum Incoming Line Voltage: 170 VAC
Absolute Maximum Incoming Line Voltage: 253 VAC

These specifications, which are all RMS voltages, are based on a perfectly symmetrical three phase AC supply with all line-to-line and line-to-neutral (ground) voltages being identical. The specification also assumes a perfectly sinusoidal waveform with the peak voltage being 1.414 times the RMS voltage.

Clarifications:

Incoming Line Voltage:

These values represent the nominal range of incoming line over which the servodrive is designed to operate and provide the rated outputs as described elsewhere in the
specifications. The servodrive will operate above and below these voltages but may not provide the full performance and reliability normally expected of the unit.

**Minimum Incoming Line Voltage:**

Below this voltage, the internal logic supplies may be inadequate for proper operation of the drive.

**Absolute Maximum Incoming Line Voltage:**

At voltages above this level, the internal DC bus voltage will be higher than the maximum safe value and the internal regenerative energy protection circuit will attempt to dissipate the excess voltage. Since this circuit is not designed for continuous operation, the servodrive will be damaged.

Operation at voltages above the nominal 230 VAC (or 115 VAC for certain SAC-DE single phase models) rating but below the Absolute Maximum rating may be possible however the amount of regenerative energy that can be absorbed by the drive may be reduced.

**Line-to-Neutral Voltage:**

In 3 phase systems, the line-to-neutral voltage should be the same for all three AC lines. In systems with a "stinger", the line having the highest line-to-neutral voltage should be connected to terminal "S" on the servodrive (See FSB 94008). The remaining two lines should have the same line-to-neutral voltage.

**Other Considerations:**

ORMEC's experience with these drives is that tolerance of incoming line voltages above 230 VAC (or 115 VAC for certain SAC-DE single phase models) rating depends on several factors. The safe absolute maximum incoming line voltage must be lower than the value shown in the specification if any of the following conditions exist:

1. The phases are asymmetrical, i.e. the line-to-line voltages are not identical.
2. The waveforms are not perfectly sinusoidal, i.e. the peak voltage is higher than 1.414 times the RMS voltage.
3. The line-to-neutral voltage on the R (r) and T (t) connections are not identical.
4. The AC lines have major voltage fluctuations or high energy spikes.

*If any of the above conditions exist, the built in soft-start circuit may not operate properly on power up. If the impedance of the circuit providing AC power is low, this may cause catastrophic failure on initial power up. Such failures usually become evident as soon as power is applied or when the servodrive is first enabled.*

*Servodrives that have been working properly for a period of time may malfunction due to an apparently unrelated or unnoticed change in the power distribution system.*

The following recommendations will help minimize the potential for premature servodrive failure.
Recommendations:

- SAC-S and SAC-D Series servodrives should not be operated at voltages lower than 170 VAC. You should ensure that the incoming line voltage does not occasionally "sag" below this level.
- If any of the conditions listed in "Other Considerations" exist, the servodrives should not be operated at incoming line voltages higher than 230 VAC.
- In applications that require the servodrive to handle large amounts of regenerative energy, the incoming line voltage should be no more than 230 VAC.
- For power systems with a "Stinger", refer to FSB 94008.

Questions:

If you have any questions about this bulletin, please contact ORMEC Service Department or your local Sales Representative.