

## 20. What information is required to properly apply the LINEATOR™ AUHF?

Review of the following questions prior to the use of a LINEATOR AUHF on a VFD application will assist in ensuring a trouble-free installation.

1. What is the system voltage and frequency?

The LINEATOR™ is available in both 50Hz and 60Hz and all nominal voltages up to 690V.

2. What is the HP rating of the VFD and motor?

For ease of application, VFD's are typically rated to motor shaft HP. To match this convention, the LINEATOR™ has also been rated to motor shaft HP. Therefore, a 100 HP application would normally call for a 100 HP VFD and a matching 100 HP LINEATOR™. The VFD is designed to handle motor losses as well as motor shaft power while the LINEATOR™ is designed for both motor losses and VFD losses in addition to motor shaft HP. LINEATOR™ performance is guaranteed to be <8% ITHD at full load and <8% ITDD over the full operating range of the VFD. Occasionally, an application will call for a VFD that has been oversized relative to the motor shaft HP (ie. motor is expected to be replaced with a larger one at a later date). The LINEATOR™ should be sized to match this higher rated VFD but there will be a slight compromise in performance since the full load rating of the LINEATOR™ will not be reached when the motor is undersized.

3. What type of load is the motor driving, i.e. fan, pump etc.?

High inertia fan loads may cause some VFD's to have DC Bus voltage stability problems on weak sources such as generators, small high impedance transformers or the LINEATOR™. In some instances, VFD parameter adjustments may need to be made prior to the application of the LINEATOR™ to prevent this condition from occurring.

4. What is the VFD model number and manufacturers name?

Basic information on the type of VFD will help ensure that the appropriate LINEATOR™ model is chosen. For a list of compatible VFD's and application recommendations, please consult the factory.

5. Is there an AC input line or DC link reactor built into the VFD?

If we are not familiar with the VFD model or manufacturer this question must be asked. If internal reactors cannot be shorted or removed, the LINEATOR™ model should be selected as follows:

DO – No AC line or DC link reactor or AC line reactor < 2%

DL – AC line reactor 2% or greater

DD – DC link reactor

6. What is the KVA rating and %Z of the transformer or generator feeding the VFD?

If we can collect this type of information along with a single line diagram we can do a quick prediction of the level of harmonics with and without the LINEATOR™ installed to demonstrate its ability to meet IEEE Std 519 limits.

7. Does the VFD have a bypass circuit arrangement?

If the VFD has a bypass circuit the LINEATOR™ must be connected to the VFD such that it can be bypassed along with the VFD. The LINEATOR™ must be installed just ahead of the VFD itself, with the bypass circuit around both (see Figure 16-1). The reason for this is that with the VFD bypassed, the LINEATOR™ will present a high impedance to the AC induction motor leading to a significant voltage drop and under excitation of the motor. This will increase the motor amps and reduce the motors torque output.

8. Will the LINEATOR™ be used on multiple VFD's or have loads connected downstream that are not VFD's?

A single LINEATOR™ can be used to supply multiple VFD's but in such an application all downstream loads must be VFD's. The trapezoidal output voltage of the LINEATOR™, although ideal for a VFD application, is not suitable for fixed speed motors or other linear loads.