

Yes and yes,

Many papers have been written on the subject of PWM drives and motor cable length considerations. This FAQ only summarizes Yaskawa's cable length recommendations as it applies to Yaskawa AC drive products.

Yaskawa guidelines:

Some protective actions should be considered. If the leads between the drive and the motor are greater than 50 meters, the high-frequency leakage current will increase, causing the drive output current to increase as well. This may affect peripheral devices. To prevent this, try adjusting the carrier frequency (as shown below). If adjusting the carrier frequency doesn't work, a load reactor may be required .

Motor Cable Length vs. Carrier Frequency

Motor Cable Length -----164ft. (50m) Maximum-----328ft. (100m) Maximum-----More than 328ft. (100m)

Carrier Frequency-----15kHz Maximum-----10kHz Maximum-----5kHz Maximum

See below for additional application data regarding motor cable length:

Application Data # AR.AFD.05

AC Drive/Motor Long Lead Issues

The benefits of using Variable Frequency Drives (VFDs) include increased energy savings in HVAC applications, improved motor torque and speed control capability and improved motor protection. VFDs have evolved from output schemes that incorporated Darlington pair transistors to today's industry standard of Insulated Gate Bipolar Transistors (IGBTs). The unique characteristics of IGBTs, including reduced energy losses during switching, have significantly increased VFD drive performance and made possible the smaller packaging designs seen today.