TECHNICAL BULLETIN

Franklin Electric

EN English

Lighting Interference (Flickering or Glowing Lights)

Problem:

In some applications, Electromagnetic Interference (EMI) from an operating Variable Frequency Drive (VFD), such as a SubDrive or MonoDrive, can produce unexpected effects on advanced, electronically controlled (smart) lighting systems. Specifically, some light fixtures (both incandescent and LED) may flicker or flash when set at lower light levels. In addition, some LED fixtures may appear to glow even when switched OFF.

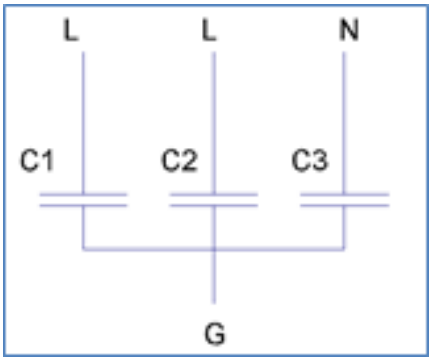
These effects occur most frequently when either the lighting system or the drive is powered from a Sub Panel with a significant distance (greater than 100 feet) from the Service Entrance Panel. The likely cause in these instances is the development of line voltage disturbances resulting from increased impedances related to sub panel wiring in combination with corresponding load currents associated with branch circuit devices connected to the sub panel. These sub panels are typically powered from the service entrance using four separate wires for L1, L2, neutral, and ground and do not have the neutral and ground terminal strips bonded.

Solutions:

1. Make sure the drive is installed and wired following all recommendations in the Installation Manual.
2. Some lighting manufacturers recommend powering their systems using a dedicated branch circuit from the Service Entrance Panel. Verify that the installation follows the manufacturer's instructions if possible.
3. If the problem still exists after both first steps have been completed, another potential solution is to add a Surge Capacitor in the Sub Panel to reduce line voltage disturbances to devices powered from the sub panel.

   For applications with 230 V single-phase input to the VFD, Surge Capacitor Filter Kit, P/N 225199902, can be directly mounted to the panel through an available knock-out. It includes four leads to be connected as follows:

   - Connect the two black leads to each AC line through a double pole breaker
   - Connect the white wire to the neutral strip
   - Connect the green wire to the ground strip.

   Applications with 230 V or 460 V three-phase input to the VFD can use Surge Capacitor Filter Kit, P/N 225199903. This device is installed similarly to the single-phase capacitor with the addition of a third black lead for connection to the third power phase.

   Either of these kits can also be installed at the Service Entrance Panel if the panel is far from the utility transformer(s) or if voltage disturbances are suspected here. When installed at the service entrance, the capacitor white lead should not be used since neutral and ground are already bonded in the panel. Be sure to insulate the lead end with an appropriately sized wire nut.

4. SubDrive/MonoDrive Utility products do not include internal EMI filtering and may require an additional step to fully mitigate LED lighting interference. If the above three steps have not resolved the issue, Input AMR Filter, P/N 226030901, should be installed in addition to the Capacitor kit.