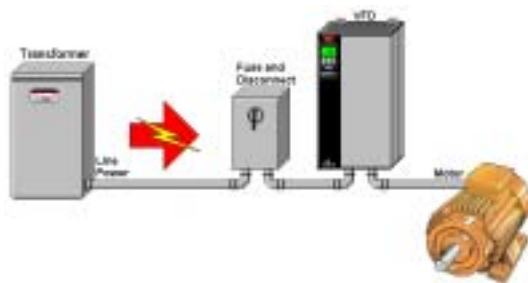


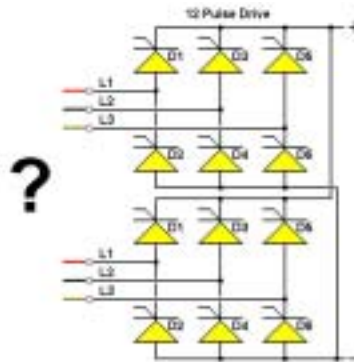
# Pre-Test



## Multiple Choice

1. Which of the following is NOT a major concern when protecting the VFD from the incoming power?
  - A. Voltage Surge
  - B. Spikes
  - C. Phase Loss
  - D. Harmonics
  - E. Voltage Sag
2. The power coming into the VFD should be limited in cycling to how many power-ups per minute?
  - A) A maximum of 1 power-up per minute
  - B) A maximum of 2 power-ups per minute
  - C) A maximum of 5 power-ups per minute
  - D) A maximum of 10 power-ups per minute
  - E) Unlimited – this is no potential problem with cycling power on the input.
3. Noise produced by the VFD going back into incoming power is defined as 2 types, Harmonics and Radio Frequency Interference (RFI). Which of the following is the best description for these 2 types of noise?
  - A) Harmonics = or < 3kHz and RFI = or > 450kHz.
  - B) Harmonics = or < 49kHz and RFI = or > 50kHz.
  - C) RFI = or < 3kHz and Harmonics = or > 450kHz.
  - D) RFI = or < 49kHz and Harmonics = or > 50kHz.
  - E) These 2 names are interchangeable meaning the same thing. RFI is most commonly used in Europe while Harmonics is commonly used in North America.

# Pre-Test



## Multiple Choice

4. To make a 12-pulse VFD work correctly, which of the following is required for the best operation?
- A) A 30° Phase Shift Transformer
  - B) 5% Input Line Reactor
  - C) Perfect balance between the 3 phases on the input.
  - D) Both A and C but not B
  - E) All 3 answers, A, B and C.

- 5) When ordering RFI filters for a VFD, 2 classes of RFI Filters are commonly identified, according to EN 55011. They are which of the following:
- A) Class 1 for residential and Class 2 for industrial.
  - B) Class 1.1 for industrial and Class 1.2 for residential.
  - C) Class X for residential and Class Y for industrial.
  - D) Class A for residential and Class B for industrial.
  - E) Class 1A for industrial and Class 1B for residential.



## ***How did you do?***

Answers:

1. D. Harmonics are not a concern when protecting the VFD
2. B. The VFD is limited to 2 power-ups per minute
3. A. Harmonics = or < 3kHz and RFI = or > 450kHz.
4. D. Both the 30° phase shift and perfect balance on the inputs are needed. The 5% input line reactor is NOT needed.
5. E. Class 1A for industrial and Class 1B for residential.

If you got 4 or 5 right – skip this lesson and go to lesson 6

If you got 3 or less right, please review this lesson.