Continuing Education Course #361
Motor Control Part 1
The Basics of Protection and Control

1. What determines the rated speed of an AC induction motor?
- ○ a. voltage
- ○ b. current
- ○ c. frequency
- ○ d. number of poles
- ○ e. voltage and frequency
- ○ f. frequency and number of poles
- ○ g. voltage and current

2. What is the purpose of a motor starter?
- ○ a. control flow of electricity and overload protection for a motor
- ○ b. start and stop a motor
- ○ c. control flow of electricity to a motor and overload and short circuit protection
- ○ d. protect the motor from overloads and short circuits

3. What components are included in a motor starter?
- ○ a. contactor
- ○ b. disconnect and overload relay
- ○ c. contactor and overload relay
- ○ d. motor starter protector, contactor and overload relay
- ○ e. short circuit protector, contactor and overload relay

4. What is the main difference between a manual motor starter and a magnetic motor starter?
- ○ a. manual motor starters use manual push buttons to operate, magnetic motor starters use magnetic switches
- ○ b. manual motor starters are for small motors, magnetic motor starters are for large motors
- ○ c. manual motor starters have a mechanical connection to operate the contactor, magnetic motor starters use magnetic fields to operate the contactor
- ○ d. there is no difference between manual motor starters and magnetic motor starters

5. In a magnetic starter, what are the two types of circuits in a motor starter?
- ○ a. integrated circuit and control circuit
- ○ b. power circuit and control circuit
- ○ c. magnetic circuit and control circuit
- ○ d. magnetic circuit and power circuit

6. What makes motor contactors different from general purpose relays?
- ○ a. motor contactors have special labels
- ○ b. there is no difference

○ c. general purpose contactors can carry high motor starting currents as well as continuous current
○ d. motor contactors must carry high starting currents as well as continuous rated current

7. When selecting IEC contactors, which ratings should be used for motor applications?
○ a. AC1
○ b. AC3
○ c. AC4
○ d. AC1 and AC3
○ e. AC3 and AC4

8. What is the impact on a contactor when it is used for jogging, rapid start/stop?
○ a. there is no impact
○ b. contactor life is extended because the motor is not running as long
○ c. contactor life is reduced
○ d. there is no impact as long as there is adequate overload protection

9. What type of control circuit can use a momentary push button for starting?
○ a. two-wire control
○ b. three-wire control
○ c. two-wire control and three-wire control
○ d. momentary push buttons cannot be used for starting motors

10. What type of control wiring causes a motor to restart automatically after power is restored after a power interruption?
○ a. Two-wire control
○ b. Three-wire control
○ c. Two-wire and Three-wire control

11. What is the function of an overload relay?
○ a. protect the motor against overload conditions
○ b. to start and stop a motor
○ c. protect the motor against overloads and short circuits
○ d. protect the motor against high starting currents

12. If a 7.5HP motor rated for 460V and 9.5amps and has a class 20 overload relay, what amount of current will cause the overload to trip in 20 seconds?
○ a. 9.5 amps
○ b. 7.5 amps
○ c. 57 amps
○ d. 190 amps

13. What type of overload relay can have the motor current adjusted without replacing parts?
○ a. melting alloy
○ b. bimetallic
○ c. electronic
○ d. melting alloy and bimetallic
○ e. bimetallic and electronic

14. What type of overload relay has a switch selectable trip class?
○ a. Melting alloy overload
○ b. Bimetallic overload

- ○ c. Electronic overload
- ○ d. Bimetallic and Electronic
- ○ e. None of the above

15. What agency requires having a disconnect within sight of a motor starter?
- ○ a. NEMA - National Electrical Manufacturers Association
- ○ b. IEC - International Electrotechnical Commission
- ○ c. NEC - National Electric Code
- ○ d. All of the above

16. For a premium efficiency design B induction motor rated at 10 HP, 460 VAC, 1800 RPM, 13 amps, if a 30 A MCP is used and the FLA dial is set at 14 amps, using Figure 6, what is the maximum setting for the instantaneous dial?
- ○ a. 8x FLA
- ○ b. 9x FLA
- ○ c. 10x FLA
- ○ d. 11x FLA
- ○ e. 13x FLA