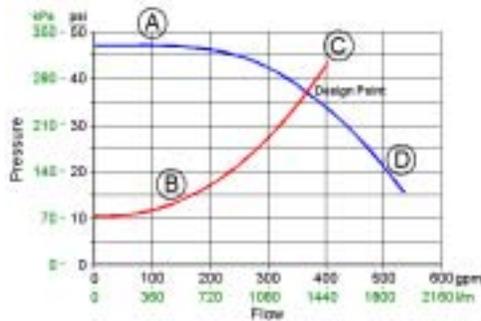


Post-Test



1) If a VFD is used to control the flow of a pump to a third of the maximum flow, which letter, ABC or D displays the VFD effects on the system curve?

2) If a throttling valve is used to limit flow in the example above, which letter, ABC or D displays the effects on the pump curve.

- 3) A VFD correctly operates which of the follow AC motors?
- A. Single-phase motor
 - B. 2-phase motor
 - C. 3-phase motor
 - D. Answers A and C are correct but not B.
 - E. All phase types of motors, A, B and C work with VFDs
- 4) Which of the following is NOT an equivalent name for a VFD?
- A. Frequency Converter
 - B. Adjustable Frequency Drive
 - C. Variable Speed Drive
 - D. Inverter
 - E. Motor Control
- 5) Looking at the nameplate of an AC motor it shows a speed of 1750rpm using 60Hz. This motor must be a _____ pole motor?
- A. 12-pole
 - B. 8-pole
 - C. 6-pole
 - D. 4-pole
 - E. 2-pole

Post-Test



Frame	Type	Design	Identification No.	
325T	P	B	1234567890	
HP20	Volts 230/460		Hz 60	Phase 3
RPM 1770	Amps 50.29	S.F. 1.15		Code F
Amb. 40°C	Duty Cont.	Encl. TEFC		Ins. Class F
		Low Volts	High Volts	
NEMA Nom. Eff. 90.2				

Motor Plate

- 6) Please review the motor nameplate and answer the following question. Which of the following statements is true?
- A. This is a synchronous motor.
 - B. This motor can run on single-phase, 2-phase and 3-phase supply.
 - C. This motor has a fan attached to the shaft.
 - D. This motor requires both 230 and 460 VAC in order to run.
 - E. The maximum amps needed for this motor is 50.29 amps.
- 7) The magnetic field inside a motor travels at 1800 rpm, but the actual shaft of the motor travels at 1750 rpm, a difference of 50 rpm. That 50 rpm is known as which of the following:
- A. Reference Point
 - B. Speed Range
 - C. Differentia
 - D. Offset
 - E. Slip
- 8) An AC motor is comprised of 2 main parts. Which of the following is the best description?
- A. The stator is on the outside and the rotor, which has the pole pairs, is on the inside.
 - B. The rotor is on the outside and the stator, which has the pole pairs, is on the inside.
 - C. The stator is on the inside and the rotor, which has the pole pairs, is on the outside.
 - D. The rotor is on the inside and the stator, which has the pole pairs, is on the outside.

Post-Test



- 9) When using a VFD on a centrifugal water pump application, what is the horsepower needed at 50% of the pump's speed? Assume no power lost because of friction.
- A. 100%HP Because Constant Torque requires it.
 - B. 50%HP It is directly related to speed.
 - C. 25%HP It is directly related to the square root of the motor speed.
 - D. 12.5%HP It is directly related to the cube root of the motor speed.
 - E. 5%HP Because motor efficiency is 95% efficient.

- 10) You just received a European motor, which was mounted on one of your pumps. It uses 50 Hz. What is the synchronous speed for a 2-pole AC induction motor using 50Hz?
- A. 3000 rpm
 - B. 2000 rpm
 - C. 1500 rpm
 - D. 1000 rpm
 - E. 500 rpm

Review - Answers



- 1) B VFD causes the pump to ride down the system curve.
- 2) A Valve causes it to ride up the pump curve.
- 3) C 3-phase motor
- 4) E Motor Control
- 5) D 4-pole motor
- 6) C motor has a fan attached to shaft
- 7) E slip
- 8) D rotor inside; stator w pole pairs outside
- 9) D 12.5%HP- related to the cube root
- 10) A 3000rpm

Objective: Student is able to:

- 1) Explain how a VFD saves energy in a pumping application.
- 2) Identify 4 other equivalent names for a VFD.
- 3) Identify the terms used with a pump application, such as pump curve, system curve and design point.
- 4) Explain the effects that a throttling valve and a VFD have on the pump curve.
- 5) Identify the 2 main parts of an AC motor.
- 6) Describe the AC motor terms such as synchronous, asynchronous, slip, and base speed.
- 7) State the expected rpm of a 2, 4 and 6-pole motor.
- 8) Identify the main reasons 3-phase are used on AC motors.
- 9) Identify the information found on the motor nameplate.

For more information, please contact the MCU Training Team.