

Certification Test

CT.SigmaTracII. 01.eLM.CertificationTest



Student Name: _____

Company Name: _____

Address: _____

Phone: _____

Email: _____

Test Date: _____

Answers:

1	_____	_____	_____	_____
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Taking the Test

- The purpose of this test is to validate the learning experience corresponding to the applicable eLearning Module. It is recommended to preview the questions before viewing the module, and answer them as the module progresses.
- The test is open book. You may use any website, manuals, software, demo, etc. The test must be taken individually; you may not contact another person for help.
- Each question has only one correct answer unless otherwise noted. Please clearly record all answers on the answer sheet. All questions are equally weighted. A passing score is 90%.

Returning the Test

- Please return **only the first page** of the test (the answer sheet) with completed answers and contact information.

Option 1: Fax the answer sheet to **Yaskawa Technical Training Services** at **(847) 887-7185**.

Option 2: e-mail a scan, photo, or edited pdf of the answer sheet with all answers and contact information to training@yaskawa.com.

Receiving Your Score

You may review your answers only if a passing score is received. You will receive a system-generated email with your score. Please allow up to 5 business days.

Linear Servo Actuators

1. Which mechanism is preferred for applications that require fast speed, long travel, high precision and repeatability?
 - A. Linear motor such as Sigma Trac II
 - B. Ballscrew actuator
 - C. Ballscrew actuator with closed loop encoder feedback
 - D. Belt actuator with full closed loop encoder feedback
2. Which order (best to worst) best ranks the possible **position settling time** of each mechanism?
 - A. Linear Motor, Ballscrew, Belt
 - B. Rack & Pinion, Linear Motor, Belt
 - C. Belt, Rack & Pinion, Ballscrew
3. Which order (best to worst) best ranks the possible combination of **speed and acceleration** of each mechanism for a light load?
 - A. Linear Motor, Ballscrew, Belt
 - B. Rack & Pinion, Linear Motor, Belt
 - C. Ballscrew, Belt, Rack & Pinion
 - D. Linear Motor, Belt, Rack & Pinion
4. Which order (best to worst) best ranks the typical **rigidity** of each mechanism?
 - A. Linear Motor, Ballscrew, Belt
 - B. Rack & Pinion, Linear Motor, Belt
 - C. Belt, Rack & Pinion, Ballscrew
5. Which order (best to worst) best ranks the typical **backlash** of each mechanism?
 - A. Linear Motor, Ballscrew, Belt
 - B. Rack & Pinion, Linear Motor, Belt
 - C. Belt, Rack & Pinion, Ballscrew

6. Which mechanism(s) generally experience a **performance** decrease as **length** increases?
 - A. Linear Motor
 - B. Ballscrew
 - C. Belt
 - D. Rack & Pinion
 - E. All of the above
 - F. A and B
 - G. B and C
 - H. B, C, and D
 - I. A and D
7. Which mechanism **cost** increases the most with an increase in **length**?
 - A. Linear Motor
 - B. Ballscrew
 - C. Belt
 - D. Rack & Pinion
 - E. All of the above
 - F. B and C
 - G. B, C, and D
8. Which mechanisms are most suitable for **vertical** loads?
 - A. Linear Motor
 - B. Ballscrew
 - C. Belt
 - D. Rack & Pinion
 - E. All of the above
 - F. B and C
 - G. B, C, and D
9. Which mechanism is best suited for **clean room** environments?
 - A. Linear Motor
 - B. Ballscrew
 - C. Belt
 - D. Rack & Pinion
 - E. All of the above
 - F. B and C
 - G. B, C, and D

10. Which mechanisms generally experience **performance** decrease due to **wear** of the power transmission components?
- A. Linear Motor
 - B. Ballscrew
 - C. Belt
 - D. Rack & Pinion
 - E. All of the above
 - F. B and C
 - G. B, C, and D
11. An assembly application requires a small part to be positioned at each of 5 stations, 200[mm] apart. The assembly operation takes 250[ms], and the part must be fully stopped before the assembly operation can begin. Accuracy is not critical, but the parts must be positioned consistently at each station. Which mechanism is likely to give the shortest cycle time over the life of the machine?
- A. Linear Motor
 - B. Ballscrew
 - C. Belt
 - D. Rack & Pinion
12. Which of the following are strengths of linear motor technology
- A. Zero Backlash
 - B. High Stiffness
 - C. Vertical Loads
 - D. All of the above
 - E. A and B only
 - F. B and C only
 - G. A and C only
 - H. None of the above

Sigma Trac II and Custom Linear Motors

13. What is the design life (distance moved) of a Sigma Trac II operating with maximum load?
- A. 10,000,000 double-strokes
 - B. 100,000 double-strokes
 - C. 100,000,000 double-strokes
 - D. 10,000,000 single-strokes
 - E. 100,000 single-strokes
 - F. 100,000,000 single-strokes
14. What peripheral devices are required for Sigma Trac II?
- A. Serial Converter
 - B. Hall Sensor
 - C. All of the above
 - D. None of the above
15. What tool used in the assembly process verifies that the assembled Sigma Trac II stage remains in tolerance as it moves to different positions?
- A. Alignment Jigs
 - B. Granite Assembly Tables
 - C. CMM Test Stand
16. A machine designer operates a facility capable of precision machining and intends to use a high volume of linear motor stages. Which Yaskawa linear motor solution should be considered?
- A. Sigma Trac II
 - B. Linear motor components with custom designed linear slide
 - C. All of the above
 - D. None of the above
17. A machine designer requires a linear motor with stroke of 2.0 meters. Which Yaskawa linear motor solution should be considered?
- A. Sigma Trac II
 - B. Linear motor components with custom designed linear slide
 - C. All of the above
 - D. None of the above