American National Standard

for Industrial Robots and Robot Systems – Path-Related and Dynamic Performance Characteristics – Evaluation

ANSI/RIA R15.05-2-1992

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American National Standard
for Industrial Robots and Robot Systems –

Path-Related and Dynamic Performance Characteristics – Evaluation

Secretariat

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Foreword (This foreword is not part of American National Standard ANSI/RIA R15.05-2-1992.)

The information contained in this foreword should not be considered part of the standard. It has been included for clarification and guidance purposes only.

This standard is intended to provide meaningful technical information to help robot users select the best robot for their specific applications. It defines the most important path-related performance criteria and a method for evaluating these criteria. These criteria are. relative path accuracy, absolute path accuracy, path repeatability, path speed characteristics and cornering deviations. These are felt to represent the best indication of the overall path-related performance of industrial robots.

In order to achieve this means of relative comparison of robots, standard test conditions and standard test paths are used. The results do have limitations and should be supplemented with additional engineering information when considering detailed systems specifications and designs

The concept of "Performance Classes" is also used in a similar manner as originally introduced in ANSI/RIA R15.05-1-1990. These Classes are used to determine the robot performance when used at rated capacity, to optimize maximum cyclic rate, to optimize path control or optimize other specific criteria important for certain applications

Additionally, in order to facilitate comparisons of like robots, standard test loads and load offsets are used in a like fashion similar to those originally introduced in the ANSI/RIA R15.05-1-1990 standard

This standard is not a safety standard and, therefore, does not directly address the safety issues related to robot performance and operation It is the responsibility of whomever uses this standard to consult and utilize appropriate safety standards and health practices

Care should be exercised in the interpretation of the results determined by this standard. Many of the parameters as measured using the guidelines described in this standard may change during the life of the robot The manufacturer should be consulted regarding performance warranties covering the life of the robot.

Use of industry standards, including this standard, is voluntary. The Robotic Industries Association makes no determination with respect to whether any robot, manufacturer, or user is in compliance with this standard

Suggestions for improvement of this standard are welcome They should be sent to Subcommittee R15.05 – Performance, Robotic Industries Association, P.O. Box 3724, Ann Arbor, MI 48106.

This standard was processed and approved for submittal to ANSI by the RIA standards Approval Committee, using the accredited organization method At the time the standard was approved, the RIA standards Approval Committee had the following members

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1 Scope, purpose, and exclusions

1.1 Scope

This standard is intended to facilitate understanding between manufacturers and users of industrial robots and industrial robotic systems. It defines the fundamental dynamic path-related performance characteristics and provides a method to quantify dynamic performance. Included in this method are performance classes, standard test paths and standard test loads Means of measuring these performance criteria are not described in this standard. Specific application testing is not addressed.

No attempt has been made to address orientation errors directly. The effects of such errors are indirectly measured through the use of axial and radial offsets Orientation errors will result in deviations in the position of the measurement point

This standard is not a safety standard and therefore does not directly address the safety issues related to robot performance and operation. It is the responsibility of whomever uses this standard to consult and utilize appropriate safety standards and health practices.

NOTES

1 For the purpose of the remaining clauses of this standard, the term robot will mean industrial robot or industrial robotic system

2 The use of ANSI/RIA R15.05-1-1990 in conjunction with this standard is recommended

1.2 Purpose

The purpose of this standard is to provide meaningful technical information that robot users can apply in the selection of the proper robot for their specific applications.

This standard has been developed to provide information which can facilitate the comparison of the performance of different robots.

1.3 Exclusions

This standard applies to the dynamic path-related performance of robots only and is not intended to apply to the following:

- Robot static performance;
- Specific application robot tests;
- Automatic guided vehicles and systems;
- Automatic conveyors and shuttle systems,
- Mobile robots,
- Tele-operators;
- Prosthetic and other aids for the handicapped,
- Automated storage and retrieval systems;
- Numerically controlled machine tools;
- Personal robots;
- Undersea and space robots,

This list is not intended to be all inclusive.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard At the time of publication, the editions indicated