

FED. SUPPLY CLASS

34 GP

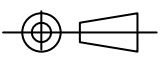
TABLE OF CONTENTS

1.	SCOPE	2
1.1	Purpose	2
1.2	Classification	2
1.3	Intended Use	2
2.	APPLICABLE DOCUMENTS	2
3.	REQUIREMENTS	3
3.1	Design	3
3.2	Class	3
3.3	Construction	3
3.4	Controls	3
3.5	Electrical Equipment	4
3.6	Lubrication	4
3.7	Safety	4
3.8	Interchangeability	4
3.9	Reliability	4
4.	INSPECTION ACCEPTANCE	5
4.1	Classification of Tests	5
4.2	Test Conditions	5
4.3	Test Details	6
4.4	Presentation of Inspection and Test Data	6
5.	OPERATING AND INSTALLATION DATA	6
6.	ORDERING DATA	8
6.1	Customer Options	8
6.2	Preservation and Packing	9
6.3	Shipping Instructions	9
7.	MANUFACTURER' S RESPONSIBILITY	9
8.	NOTES	9
8.1	Terminology and Definitions	9

TABLES

TABLE I – FAILURE RATE	5
TABLE II – SAMPLE COMPUTATION	5

② COMPLETELY REVISED

THIRD ANGLE PROJECTION		CUSTODIAN ENGINEERING MANAGEMENT COMMITTEE	REVISION 2
PROCUREMENT SPECIFICATION	TITLE NUMERICAL CONTROL SYSTEM	CLASSIFICATION SPECIFICATION	DAS953
NONE			SHEET 1 OF 11



Documents
SHEET 1 OF 11
Document Sharing Hub

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.
1000 WILSON BLVD.
ARLINGTON, VA 22209

THIS DRAWING SUPERSEDES ALL ANTECEDENT STANDARD DRAWINGS FOR THE SAME
PRODUCT AND SHALL BECOME EFFECTIVE NO LATER THAN SIX MONTHS FROM THE LAST
REVISION DATE:

FORM 12-01

REVISION DATE: FEBRUARY 28, 2013

ISSUE DATE: JUNE 1962

1. SCOPE

1.1 Purpose

This specification provides a standard for the manufacture, performance, reliability, inspection and procurement of Numerical Control Systems. This standard lists minimum requirements and is not intended to limit design advances.

1.2 Classification

Numerical control systems for AIA Class III for point to point and AIA Class IV for continuous path control.

1.3 Intended Use

The control systems described by this specification are intended for use in the aerospace manufacturing industry in conjunction with equipment procured in accordance with National Aerospace Standards. Such systems shall provide automatic control, by pre-recorded data, of manufacturing equipment and/or processes, including, but not limited to, milling, boring, drilling, and turning.

2. APPLICABLE DOCUMENTS

The latest revision of the following specifications, codes, and standards are included as a portion of this specification. Detail requirements of this specification shall preclude any contradictory portions of the following specifications, codes, and standards.

State and Local Safety Codes

TechAmerica

EIA-RS-281-B Electrical and Construction Standards for Numerical Machine Control

Copies can be obtained from TechAmerica, 601 Pennsylvania Avenue NW, North Building, Suite 600, Washington DC, 20004, www.techamerica.org.

Aerospace Industries Association

- NAS938 Machine Axis and Motion Nomenclature
- NAS943 Interchangeable Perforated Tape Standards, Variable Block Format for Positioning and Straight Cut Numerically Controlled Equipment
- NAS955 Interchangeable Perforated Tape Standards, Variable Block Format, Contouring and Contouring/Positioning Numerically Controlled Equipment
- NAS968 Interchangeable Digital Magnetic Tape Standards, Variable Block, Word Address Format, Contouring and Contouring/ positioning Equipment
- NAS969 Interchangeable Digital Magnetic Tape Cartridge-for Numerically Controlled Machines

Copies can be obtained from AIA, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209, www.aia-aerospace.org.

National Fire Protection Association

NFPA 79 Electrical Standard for Industrial Machinery

Copies can be obtained from NFPA, 1 Batterymarch Park, Quincy, MA 02169, www.nfpa.org.

Association of American Railroads

- AAR DPA21 Minimum Loading Standards for Machinery in Closed Cars
- AAR Open Top Loading Rules Manual

Copies can be obtained from AAR, 425 Third Street SW, Washington, DC 20024, www.aar.org.

② COMPLETELY REVISED

REVISION
2

3. REQUIREMENTS

3.1 Design

The general shape and arrangement of the control cabinets, control equipment, and associated components shall combine necessary functions with accessibility, neatness, and minimum space consistent with good engineering practice. The manufacturer has the choice of configuration and the functional operation of the system, except where specifically stated in this specification.

3.2 Class

3.2.1 System Class III for positioning and straight cut machines as further defined in NAS943, Appendix A.

3.2.2 System Class IV for contouring and contouring/positioning machines as further defined in NAS955, Appendix A.

3.3 Construction

The system shall be constructed to comply with the requirements of this specification and others as noted.

3.3.1 The system shall be designed and constructed to operate continuously in a normal factory environment defined as follows:

Room ambient temperature – from 60 °F to 120 °F
Room ambient relative humidity – from 10% to 95%
Line voltage fluctuation – $\pm 10\%$ of rated voltage

3.3.2 Components sensitive to vibration shall be protected.

3.3.3 The system shall be equipped with self-contained protection against dust present in a non-air-conditioned factory environment. Filtration, if used, shall be sized for unattended 3-months service periods.

3.3.4 Input data reader shall be protected from environmental contaminants, visible, and accessible.

3.3.5 Program position on control medium shall be indicated at all times by means of a block counter, footage indicator, sequence number readout, or similar device, as specified by customer.

3.3.6 Provisions for detecting excess servo error shall shut down the machine when such excess error occurs.

3.3.7 The system shall be such that "stops" can be programmed as desired for such purposes as inspection, speed change, etc. Resumption of automatic operation shall not cause any loss of position accuracy.

3.3.8 System axis designation shall conform to NAS938.

3.3.9 System construction details shall conform to EIA-RS-281-B.

3.4 Controls

All primary operator's control buttons, switches, levers, gages, and regulating devices shall be grouped and mounted in a location affording the operator (when in his normal, established work position) maximum visibility of the machine, tooling, and work.

② COMPLETELY REVISED

REVISION
2

- 3.4.1 The system shall be capable of controlling machine movements individually and/or simultaneously in such combinations as specified by customer.
- 3.4.2 Emergency stop buttons shall be readily available to operator at operator's remote control panel and pendant station or at control station mounted on machine.
- 3.4.3 Readily accessible reversing switches for changing direction of each linear motion shall be provided.
- 3.5 Electrical Equipment
- All electrical equipment and its installation shall conform to ~~NMTBA Machine Tool Electrical Standards~~ NFPA 79. All systems shall be equipped to operate from a primary supply of 220/440 volt, 3 phase, 60 cycle current unless otherwise specified.
- 3.5.1 Electronic components shall be arranged into convenient plug-in or quick disconnect module type units. The units shall be standardized and interchangeable whenever practical. Identification shall be permanently marked on each module.
- 3.5.2 Where practical, testing circuits shall be incorporated to facilitate system maintenance.
- 3.5.3 Reasonable care shall be exercised to protect the system from electrical damage caused by power surges, transients, failures, overload, and signals in the air, such as from radio transmitters, welders, and X-ray machines.
- 3.5.4 Identification of all replaceable parts shall be permanently marked with the original manufacturer's part number. Tubes shall be marked adjacent to each socket. Transistors, diodes, resistors, capacitors and other components shall be marked per EIA-RS-281-B.
- 3.5.5 Terminal strips and wires shall be permanently marked.
- 3.6 Lubrication
- Lubrication shall be adequate for the purpose but not excessive. Points requiring lubrication shall have provisions for such lubrication with the type of lubrication permanently indicated adjacent.
- 3.7 Safety
- Control system shall be furnished with adequate safety devices of the latest approved type. Moving parts which are hazardous to personnel shall be suitably guarded. All equipment and components shall conform to the safety requirements of the state where equipment is to be installed.
- 3.7.1 Warning light(s) shall be provided to indicate the actuation of safety devices.
- 3.8 Interchangeability
- All replaceable parts shall be manufactured to definite standards of tolerance, clearance, and workmanship in order that any such part of a particular type or model may be replaced or installed without modification.
- 3.9 Reliability
- The numerical control system builder shall design the system to provide a failure rate not exceeding that calculated from Table I for each 2000 hours of machine operation. (Note: See Paragraph 8.1.8 for definition of a "failure".) This failure rate performance shall be considered applicable after a shake-down period equivalent to the sum of the hours allotted to the complexity features of the system per last column of Table I.

REVISION
2

② COMPLETELY REVISED



NAS953
SHEET 4

Document Sharing Hub