



INACTIVE DESIGN AFTER 31 JULY 2012
NATIONAL AEROSPACE STANDARD

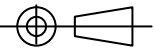
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FED. SUPPLY CLASS

INACTIVE FOR DESIGN AFTER 31 JULY 2012. NO SUPERSEDING STANDARD. FOR DESCRIPTION OF STATUS NOTES SEE NAS380.

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FORM 09-01	THIRD ANGLE PROJECTION 	CUSTODIAN ENGINEERING MANAGEMENT COMMITTEE	REVISION 4
	PROCUREMENT SPECIFICATION NONE	TITLE MANUAL GAS TUNGSTEN ARC (GTA) FUSION WELDING EQUIPMENT	CLASSIFICATION SPECIFICATION NAS961 SHEET 1 OF 14



1.0 SCOPE INACTIVE FOR DESIGN AFTER 31 JULY 2012

1.1 Purpose

This specification provides a standard for the manufacture, performance, inspection, reliability and procurement of a series of manual gas tungsten arc welding equipment. This standard lists minimum requirements and is not to limit design advances.

1.2 Classification

The machines shall be of the following types, sizes and classes.

1.2.1 Type

- I Direct Current
- II Alternating Current
- III Combination AC/DC
- IV Pulsed DC

1.2.2 Size

Power source and accessory size shall be rated in terms of current rating (amperes) at 60% duty cycle for each current type.

1.2.3 Class

Commercial Hardware - stock item
Modified Commercial Hardware
Custom Hardware

1.3 Intended Use

The welding system described in this specification is intended for use in the aerospace manufacturing industry and provides performance criteria for manual gas tungsten arc welding machines for welding of ferrous and non-ferrous alloys.

LIST OF CURRENT SHEETS

NO.	REV.	NO.	REV.	NO.	REV.	NO.	REV.
1	3	5	3	9	3	13	3
2	3	6	3	10	3		
3	2	7	3	11	3		
4	3	8	3	12	NEW		

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INACTIVE FOR DESIGN AFTER 31 JULY 2012

CUSTODIAN: MANUFACTURING COMMITTEE

PROCUREMENT SPECIFICATION	TITLE	CLASSIFICATION SPECIFICATION
NONE	MANUAL GAS TUNGSTEN ARC (GTA) FUSION WELDING EQUIPMENT	NAS 961 Documents

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INACTIVE FOR DESIGN AFTER 31 JULY 2012

2.0 APPLICABLE SPECIFICATIONS, CODES AND STANDARDS

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

- 2.1 The Joint Industrial Council (JIC) Electrical Standards for General Purpose Machine Tools, EGP.1.1967. (3.5)
- 2.2 National Electrical Code (NEC). (3.5)
- 2.3 Electronic Industries Association Standards for Electronic Wiring and Components RS 281.
- 2.4 Federal, State and Local regulations pertaining to radio interference.
- 2.5 National Aerospace Standard 972, Glossary of Manufacturing Equipment Terms.
- 2.6 Welder Qualification MIL-T-5021 (ASG).
- 2.7 American Welding Society's Standards A 3.0-69.
- 2.8 State and Local Safety and Electrical Codes.
- 2.9 Occupational Safety & Health Standard Part 1910 of Chapter XVII of Title 29 of the Code of Federal Regulations (Occupational Safety & Health Act (OSHA) - 1970). (3.8)

3.0 REQUIREMENTS

3.1 Design

The manufacturer has the choice of configuration and the functional operation of the machine, except where specifically stated in this specification or customer direction.

3.2 Types, Sizes, Class

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NAS 961

SHEET 2

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INACTIVE FOR DESIGN AFTER 31 JULY 2012

TABLE I

Type	I DC	II AC	III AC/DC	IV Pulsed DC
<u>Rated Output</u>				
At 60% duty	---Manufacturer shall specify---			
At 100% duty	---Manufacturer shall specify---			
<u>Output Current Range</u>	---Manufacturer shall specify---			
<u>Welding Current Regulation</u>				
Actual output repeats to the same dial setting within	2%	2%	2%	2%
<u>Ripple</u> in DC mode not to exceed	..5% or 1 amp, whichever is greater			
<u>Drift</u> not to exceed in 1 hour	...1% or 1 amp, whichever is greater			
<u>Response</u> Min to max current accomplished in less than	8	8	8	8 cycles
Max to min current accomplished in less than	8	8	8	8 cycles
<u>Unbalance</u> In balanced wave not to exceed	--	2%	2%	--
<u>Power Factor</u>	...not less than 75% at max rated output			
<u>Open Circuit Voltage</u> (minimum)	75	75	75	75 volts
<u>Output Voltage Values</u>				
At specified min current	6	6	6	6 volts
At specified max current	40	40	40	40 volts
<u>Current Level Change</u>				
Accomplished in less than	--	--	--	1 millisecc.

NOTE: Changes to any limits above will be specifically noted by the customer or by the manufacturer.

INACTIVE FOR DESIGN AFTER 31 JULY 2012

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Documents

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INACTIVE FOR DESIGN AFTER 31 JULY 2012

3.3 Machine Sub-Systems

3.3.1 Weld head or torch assemblies

- 3.3.1.1 Electrode holders may be classed as capable of 600, 300, or 150 amps AC and/or DC straight polarity service under continuous duty.
- 3.3.1.2 The torch body shall be adequately cooled. It shall not exceed 120° F when operating at maximum capacity with 75° F water.
- 3.3.1.3 The dielectric materials used in the torch body shall be capable of resisting, maintaining electrical insulation against, high frequency or capacitor start, open circuit and welding voltages and currents.
- 3.3.1.4 Power cables shall be of sufficient size to conduct the maximum current and have a temperature rise not greater than 12° C over ambient, under continuous operation.
- 3.3.1.5 Lines for inert gas shall be flexible and durable and made of material that will prevent contamination by the release of absorbed or transmitted contaminants such as moisture, lubricants, or solvents.

3.3.2 Machine Controls

The machine will be adjusted or operated from panel front switches, timers, knobs, or levers convenient to the operator and/or by remote control pendants or foot controls readily connected to outlets on the front of the panel.

3.3.3 Operator Controls

- 3.3.3.1 The power source shall have stepless current control current over the entire range of the power source. Stepless control in high and low switched ranges is a customer option.
- 3.3.3.2 Current controls shall be graduated from 0 to 100% in 1% increments.
- 3.3.3.3 A polarity switch shall be available for reversing polarity of welding leads under no load condition on DC welders (customer option).
- 3.3.3.4 Provisions shall be made (customer options, manufacturer shall specify) for high frequency arc starter or stabilizer. With this feature a switch will be provided for "on" (continuous) or "off" control or it may include a adjustable duration of hi frequency during start (customer option).
- 3.3.3.5 An arc booster or capacity start may be provided for starting (customer option).

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NAS 961

SHEET 4