

[INCH-POUND]
A-A-59148
28 January 1998
SUPERSEDING
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December 18, 1985
MIL-W-80027D
December 26, 1984

COMMERCIAL ITEM DESCRIPTION

WELDING MACHINE, ARC, AC/DC INVERTER, CONSTANT CURRENT

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. SCOPE. This commercial item description (CID) covers constant alternating current /direct current (AC/DC) inverter arc welding machines. The welding machines covered by this CID are intended for manual welding use in operations that require the efficient and permanent joining of similar or dissimilar metal pieces. The machines are used to weld various metal alloys in environments such as construction sites, fabrication, and repair shops.

2. CLASSIFICATION. The welding machines shall be of the following sizes. The size to be furnished shall be as specified (see 7.2(b)).

Size 150 - 150 amperes
Size 200 - 200 amperes
Size 300 - 300 amperes
Size 400 - 400 amperes
Size 500 - 500 amperes

Beneficial comments, recommendations, additions, deletions, clarifications, etc., and any data which may improve this document should be sent to: Defense Supply Center Richmond, ATTN: DSCR-VBD, 8000 Jefferson Davis Highway, Richmond, VA 23297-5610.

AMSC N/A

FSC 3431

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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3. SALIENT CHARACTERISTICS

3.1 General requirements. The welding machine shall be new and one of the manufacturer's current models capable of operation in accordance with the requirements herein. All parts subject to wear, breakage, or distortion shall be accessible for adjustment, replacement, and repair. The machine shall be designed and manufactured in accordance with the American National Standards Institute/National Electrical Manufacturers Association (ANSI/NEMA) EW 1.

3.2 Components. The welding machine shall include, as a minimum, the following components:

3.2.1 Enclosure. The welding machine enclosure shall be fan cooled and manufactured to withstand the rough handling normally encountered in construction areas. Ventilation holes shall be covered with screens or small enough to prevent the entry of debris. The enclosure shall be fitted with handles, wheels, or lifting eyes as specified (see 7.2(c)). Electrical connection points and machine controls shall be clearly labeled.

3.2.2 Power source. The welding machine power source shall be the inverter type capable of delivering the required AC or DC current output and shall maintain constant current during the welding process. The power source shall have thermal overload protection and power factor correction. Unless otherwise specified (see 7.2(d)), power source duty cycle shall be not less than 40 percent for the size specified.

3.2.3 High-frequency generator. When specified (see 7.2(e)), the welding machine shall be equipped with a high-frequency (HF) generator for DC arc initiation and AC arc stabilization.

3.2.4 Controls. The welding machine controls shall, as a minimum, consist of an "on/off" switch, welding current control, and an "AC/DC" switch. The following controls shall be provided as specified (see 7.2(f)):

- a. Remote foot current control and arc initiation.
- b. DC electrode positive/negative switch.
- c. Adjustable current ramping control for blast prevention and crater filling.
- d. Adjustable wave balance for AC welding.

3.2.5 Gas shielding and cooling water. When specified (see 7.2(g)), the welding machine shall provide a means to dispense and adjust the flow of shielding gas and cooling water. When specified (see 7.2(h)), the shielding gas and cooling water controls and metering components shall be contained on the welding machine. The following features shall be provided as specified (see 7.2(i)):

- a. Gas and water fixed preflow duration and adjustable postflow duration.
- b. Heat exchanger or refrigeration unit for cooling water.

3.2.6 Electrical system. The welding machine shall operate from a 230/460-volt, 3-phase, 60-hertz circuit. Unless otherwise specified (see 7.2(j)), the welding machine shall be initially wired for 230-volt operation.

3.2.7 Optional components. Optional components shall be furnished as specified (see 7.2(k)).

3.3 Performance. Unless otherwise specified (see 7.2(l)), the welding machine shall meet the performance requirements of ISO 1708 when tested in accordance with sections 5.3 through 5.3.4.

3.4 Machine dimensions and weight. If required, the maximum machine dimensions (length, width, and height) and machine weight shall not exceed the restrictions specified (see 7.2(m)).

3.5 Safety and health requirements. The manufacturer shall ensure that the welding machine and all equipment and accessories used on the machine shall be in compliance with American Welding Society (ANSI/AWS) Z49.1 and Occupational Safety and Health Administration (OSHA) 29 CFR PART 1910. If a conflict arises between the ANSI/AWS and OSHA standards, the OSHA standards shall apply. Covers, guards, or other safety devices shall be provided for all parts of the system that present safety hazards. The manufacturer shall ensure that the machine is intended for manual use. A machine having a power source with an open circuit voltage greater than those listed in NEMA EW 1 section 5.3.2 shall not be provided as a manual system.

3.6 System of units. The U.S. Customary System of Units (US) or the International System of Units (SI) shall be used to graduate measuring and indicating devices. When only one system of graduation is acceptable, the particular graduation required shall be as specified (see 7.2(n)). Regardless of the measurement system used, all measuring and indicating devices on the machine shall be graduated in the same system. When specified (see 7.2(o)), measuring and indicating devices shall be graduated in both the US and SI system of measurements.

3.7 Nameplate. A nameplate shall be securely attached to the machine. Unless otherwise specified (see 7.2(p)), the nameplate shall contain the following information:

- a. Manufacturer's name.
- b. Machine model designation.
- c. Power input (volts, total amperes, phase, frequency).
- d. Rated load volts and amperes.
- e. Maximum open circuit voltage.
- f. Duty cycle at rated load.
- g. Contract number or order number.
- h. National stock number or plant equipment code.
- i. Date of manufacture.

4. REGULATORY REQUIREMENTS

4.1 Recovered materials. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

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4.2 Environmental protection. The item shall meet all applicable Environmental Protection Agency (EPA) restrictions in effect on the date of the contract. These regulations apply to the emission of materials hazardous to the environment or the user's health and shall be adhered to during the manufacturing, service, transportation, storage, and operation/use of the item.

5. QUALITY ASSURANCE PROVISIONS

5.1 Product conformance. The products shall meet the salient characteristics of this commercial item description; conform to the manufacturer's own drawings, specifications, standards, and quality assurance practices; and be the same system offered for sale in the commercial market. The Government reserves the right to require proof of such conformance.

5.2 Inspection. The arc welding machine shall be inspected to determine compliance with all requirements specified in this CID.

5.3 Testing. Unless otherwise specified (see 7.2(q)), the welding machine shall be tested in accordance with sections 5.3.1 through 5.3.4.

5.3.1 Test setup and conditions. Unless otherwise specified (see 7.2(r)), the manufacturer shall be responsible for supplying all tooling and material(s) and shall conduct all tests required by the Government. The manufacturer shall provide test instruments and equipment with calibration traceable to National Institute of Standards and Technology (NIST) and shall provide certification of calibration as specified (see 7.2(s)).

5.3.2 Operational test. The arc welding machine shall be operated in accordance with the manufacturer's standard operating procedures. Proper operation of all controls and features shall be verified during the test period.

5.3.3 Performance tests. The performance tests shall be conducted in accordance with the following sections of NEMA EW 1:

- a. High-potential test - section 7 of NEMA EW 1.
- b. Drop test - section 3.8.2 of NEMA EW 1.
- c. Temperature rise test - section 6 of NEMA EW 1.
- d. High-frequency generator test - section 10 of NEMA EW 1.
- e. Output test - section 5 of NEMA EW 1.

5.3.4 Optional tests. Optional tests shall be conducted as specified (see 7.2(t)).

5.4 Acceptance. Unless otherwise specified (see 7.2(u)), preliminary and final acceptance tests shall be conducted at the manufacturer's site. Failure of the machine to meet the tests called out in section 5.3 through 5.3.4 shall be cause for rejection.

6. PACKAGING

6.1 Packaging requirements. Preservation, packing, and marking shall be as specified (7.2(v)).

7. NOTES

7.1 Sources of documents.

7.1.1 Government documents. Copies of Federal documents may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

7.1.2 Industry standards. Copies of industry standards referenced in this CID may be obtained from the following addresses:

American National Standards Institute (ANSI)

ANSI/AWS Z49.1 Safety in Welding, Cutting, and Allied Processes

Applications for copies should be sent to: American National Standards Institute, 11 West 42nd Street, New York, NY 10036.

National Electrical Manufacturers Association (NEMA)

NEMA EW 1 Electric Arc Welding Power Sources

Applications for copies should be sent to: National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.

Occupational Safety and Health Association (OSHA)

OSHA 1910 Occupational Safety and Health Standards for General Industry
(29 CFR Part 1910)

Applications for copies should be sent to: U.S. Department of Labor, 200 Constitution Avenue NW, Room 423, Washington, DC 20210.

7.2 Ordering data. Acquisition documents must specify the following:

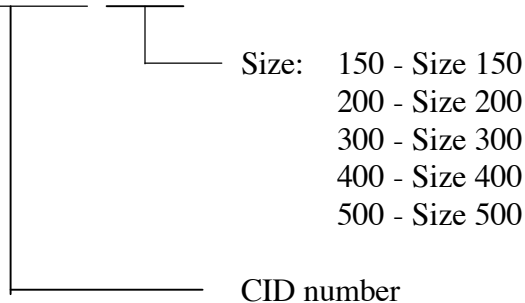
- a. Title, number, and date of this document.
- b. Type and size of arc welding system required (see 2.1).
- c. Enclosure lifting features - handles, wheels, lifting eyes, etc., as specified (see 3.2.1).
- d. Duty cycle, if different (see 3.2.2).
- e. High-frequency generator, if required (see 3.2.3).
- f. Optional control features, as specified (see 3.2.4).
- g. Shielding gas and cooling water, if required (see 3.2.5).

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- h. Shielding gas and cooling water controls location, if required (see 3.2.5).
- i. Shielding gas and cooling water optional features, as specified (see 3.2.5).
- j. Electrical system, if different (see 3.2.6).
- k. Optional components, as specified (see 3.2.7).
- l. Performance , if different (see 3.3).
- m. Machine dimensions and weight, as specified (see 3.4).
- n. System of units required (see 3.6).
- o. Dual system of units, if required (see 3.6).
- p. Nameplate, if different (see 3.7).
- q. Testing, if different (see 5.3).
- r. Test setup - tooling and material responsibility, if different (see 5.3.1).
- s. Calibration certification, if required (see 5.3.1).
- t. Optional tests, as specified (see 5.3.4).
- u. Acceptance, if different (see 5.4).
- v. Packaging requirements (see 6.1).

7.3 Part identification number (PIN). The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor.

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MILITARY INTERESTS:

Custodians

Air Force - 99

Army - AL

Navy - SH

PREPARING ACTIVITY

DLA - GS

(Project 3431-0230)