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* INCH-POUND *

S-U-2833
April 29, 1994

SUPERSEDING
MIL-U-17691D
23 May 1988

FEDERAL SPECIFICATION

UNIT HEATER, AIR-CIRCULATING, STEAM - HOT WATER

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE

1.1 Scope. This specification covers unit air heaters using steam or hot water as the heating medium.

1.2 Classification. The unit heaters shall be of the following types and classes as specified (see 6.2).

Type I - Propeller fan
Type II - Centrifugal fan

Class I - Steam heater
Class II - Hot water heater

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent
*data which may be of use in improving this document should be addressed to: *
*Commanding Officer (Code 156), Naval Construction Battalion Center, *
*1000 23rd Avenue, Port Hueneme, CA 93043-4301, by using the Standardization *
*Document Improvement Proposal (DD Form 1426) appearing at the end of this *
*document or by letter. *

AMSC N/A FSC 4520

Federal Standard

FED-STD-123 - Marking for Shipment (Civil Agencies)

Military Specifications

MIL-P-116 - Preservation, Methods of
MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible
MIL-V-173 - Varnish, Moisture and Fungus Resistant (for Treatment of Communications, Electronics and Associated Equipment)

Military Standards

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129 - Marking for Shipment and Storage
MIL-STD-461 - Control of Electromagnetic Interference Emissions and Susceptibility, Requirements for the
MIL-STD-462 - Electromagnetic Interference Characteristics, Measurement of
MIL-STD-2073-1 - DoD Material Procedures for Development and Application of Packaging Requirements

(Unless otherwise indicated, copies of Federal and Military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents which are current on the date of the solicitation (see 6.2).

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)

Standard 33 - Methods of Testing Forced Circulation Air Cooling and Air Heating Coils

(Application for copies should be addressed to the American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1791 Tullie Circle, N.E., Atlanta, GA 30329.)

American Society of Mechanical Engineers (ASME)

B1.1 - Unified Inch Screw Threads (UN and UNR Thread Form)
B1.20.1 - Pipe Threads, General Purpose (Inch)
B1.20.3 - Dryseal Pipe Threads (Inch)

ASME Boiler and Pressure Vessel Code
Section VIII, Division 1 - Rules for Construction of Pressure Vessels

(Application for copies should be addressed to the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017.)

ASTM

ASTM D 3951 - Commercial Packaging

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103.)

National Electrical Manufacturers Association (NEMA)

NEMA ICS 1 - General Standards for Industrial Control and Systems
NEMA ICS 2 - Industrial Control Devices, Controllers and Assemblies
NEMA ICS 4 - Terminal Blocks for Industrial Use
NEMA ICS 6 - Enclosures for Industrial Control and Systems
NEMA MG 1 - Motors and Generators

(Application for copies should be addressed to the National Electrical Manufacturers Association, 2101 L Street, N.W., Washington, DC 20037.)

National Fire Protection Association (NFPA)

NFPA 70 - National Electrical Code

(Application for copies should be addressed to the National Fire Protection Association, One Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The unit heater shall be a self-contained, factory-assembled unit consisting of a heating element, a fan(s), electric motor, a housing, and outlet vanes or diffusers. The heater shall be ready for connection to a source of electricity and to steam or hot water piping. When specified (see 3.7.2, 6.1.1, and 6.2), the equipment shall include operating controls. The heater shall operate with minimum noise consistent with its capacity, velocity, and fan speed. Type I heaters shall be designed for horizontal or vertical air delivery, as specified (see 6.2). Type II heaters shall be designed for floor- or wall-mounting, or ceiling suspension, as specified (see 6.2).

3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.2.1 and 6.2).

3.3 Standard commercial product. The unit heater shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer's standard commercial product, shall be included in the unit heater being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model.

3.3.1 System of measurement. The dimensions used in this specification are not intended to preclude the use of the metric system of measurement in the fabrication and production of the material, individual parts, and the finished product, provided form, fit, and function requirements are satisfied.

3.4 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specified.

3.5 Design. The unit heater shall be designed to withstand strains, jars, vibrations and other conditions incidental to shipping, storage, and installation, and to permit easy accessibility for maintenance and service in the field. The design shall be such as to prevent conditions hazardous to personnel or deleterious to equipment. The unit heater shall be designed to meet or exceed the conditions indicated in table I as specified (see 6.2). Unless otherwise specified (see 6.1.2 and 6.2), the maximum design pressure shall be 150 pound-force per square inch gage (psig) (1034.21 kilopascals (kPa)) at 366 degrees Fahrenheit (oF) (185.56o Celsius (C)) for steam, and 150 psig (1034.21 kPa) at 250oF (121.11oC) for hot water. Screw threads shall conform to the requirements of ASME B1.1, B1.20.1, and B1.20.3, as applicable.

TABLE I. Design conditions.

Class 1 Steam heater	Class 2 Hot water heater
British thermal units per hour (Btu/h) (watts (W)	Btu/h (W)
Operating steam pressure (psig) actual (kPa (gage))	Operating water temperature oF (oC)
Entering air temperature oF (oC)	Operating water pressure psig (kPa (gage))
Air delivery cubic feet per minute (ft3/min) (cubic meters per second (m3/s)), at 70oF (21.11oC)	Water flow, gallons per minute (liters per minute)
Fan speed, in revolutions per minute (rpm)	Entering air temperature oF (oC)
Air discharge velocity, ft3/min (m3/s)	Air delivery, ft3/min at 70oF. (m3/s at 21.11oC). Fan speed in rpm
Final air temperature, oF	Final air temperature oF (oC)
Condensate, pounds per hour (kilograms per second (kg/s)	For type II heater, air pressure drop through heater, inches (mm) of water
For type II heater, air pressure drop through heater, inches (millimeters (mm)) of water	

3.5.1 Capacity. When steam or hot water, as specified herein, is used as the heating medium, and when the entering air is at the temperature specified in 3.6, the capacity of the unit heater in Btu/h (W) shall be not less than that specified (see 6.2).

3.6 Construction. The unit shall be so constructed as to be complete and ready for operation after it has been installed and connected to the specified steam or hot water piping (see 3.1), to the source of electricity (see 3.7.1), and when specified herein to the operating controls (see 3.1 and 3.7.2).

3.6.1 Housing. Housing for the unit heater shall be of steel or aluminum and shall support the unit heater with a minimum of vibration during the operation. When mounted as specified in 3.1, the type II unit heater shall have an easily removable panel conveniently located to provide access to the heater parts. Supporting members and braces shall be furnished as required to insure rigidity.

3.6.2 Deflectors, diffusers, and outlets.

3.6.2.1 Type I heaters. Unless otherwise specified (see 6.2), the horizontal heater shall be equipped with an adjustable louver-type deflector to direct heater air that covers an area subtended by a minimum angle of 45o. The louvers shall be steel, each individually adjustable, and shall not rattle during heater operation. Unless otherwise specified (see 6.2), the vertical heater shall be equipped with a cone discharge.

3.6.2.2 Type II heaters. Unless otherwise specified (see 6.2), heater outlets shall be provided with nozzles or louvers. Heater outlets shall have an air flow discharge direction as specified (see 6.2). When specified (see 6.2), the housing for the type II unit heater shall have a rigid flange for connection to an air intake duct.

3.6.3 Heating element. The heating element shall be a tube-and-fin type. Unless otherwise specified (see 6.1.2 and 6.2), tubes shall be copper, copper-alloy, or hot dipped galvanized steel. Fins for copper or copper-alloy tubes shall be aluminum, copper or copper-alloy. Fins for tubes of other compositions shall be made of the same material as the tubes. Fins shall be mechanically bonded, silver soldered, brazed, or welded to the tubes or the tubes hydraulically expanded into the fins or the entire tube and fin assembly may be hot dip galvanized to ensure tight, rigid metal-to-metal contact under the design conditions specified in 3.5. Headers shall be made of steel, malleable iron, copper, or copper-alloy. The heating element, while submerged in water under pneumatic pressure, shall withstand 1.25 times the maximum allowable operating pressure multiplied by the lowest ratio of the allowable stress value for the test temperature of the heater test material to the allowable stress value at the design temperature specified in 3.5, or 250 psig (1723.68 kPa), whichever is greater. The allowable stress values for the material used shall be as given in ASME Boiler and Pressure Vessel Code, Section VIII, Pressure Vessels.

3.7 Electrical system.

3.7.1 Electric motors. The fan motor shall be designed for satisfactory operation on an electrical current supply having characteristics as specified (see 6.2). The motor shall conform to the requirements of NEMA MG 1 and shall be single- or multi-speed with number of speeds as specified (see 6.2). The motor shall be insulated Class B per NEMA MG 1, and shall have the capacity to operate fan continuously in an ambient temperature from 50 to 100oF (10 to 37.78oC) without exceeding the allowable temperature rise. When specified (see 6.2), the motor shall be totally enclosed, fan cooled (TEFC).

3.7.2 Operating controls. When operating controls are required in 3.1, the unit heater shall be controlled manually or automatically, as specified (see 6.2). Automatic controls shall be pneumatic or electrical powered devices as specified (see 6.2). In accordance with NEMA ICS 1, ICS 2, and ICS 4, electrical controls shall have the required capacities and electrical characteristics to operate the fan motor. Electrical control circuits shall not exceed 120 volts (V). Fan motor switch shall either be mounted as an integral part of the heater or furnished as a separate switch with the unit. The motor starter shall be manual or magnetic across-the-line type as specified (see 6.2). Both types shall include thermal-overload protection for the motor windings and each type shall be equipped with a manual reset push-button; the magnetic type shall also include under voltage protection. All controls with electrical components shall be listed in the UL Recognized Component Directory. Unless otherwise specified (see 6.2), electrical enclosures shall be NEMA type I in accordance with NEMA ICS 6. When the control voltage is other than line voltage, the necessary control transformer shall be furnished.

3.7.2.1 Manual. Manual control of the heater shall be by means of the motor-starter switch, which shall be furnished.

3.7.2.2 Automatic. The system for automatic control shall be of the modulating or on-off type, as specified (see 6.2). The modulating system, equipped with thermostat and control valve, shall automatically throttle the heating medium and provide means for continuous fan operation. The on-off system shall control the starts and stops of the fan-motor by a furnished

thermostat. The modulating or on-off system thermostat shall have the characteristics as specified (see 6.1.1 and 6.2). Both automatic systems shall be equipped with limit controllers to prevent fan operation when the supply line is below a predetermined temperature. A 3-position selector switch shall be furnished for use with both systems. This switch shall provide manual fan-motor operation without temperature control, provide an off-position, and accomplish automatic control.

3.7.3 Wiring. Wiring shall be in accordance with NFPA 70. Provisions shall be made to ground all electrical equipment.

3.8 Fungus resistance. When specified (see 6.2), electrical components and circuit elements, including terminal and circuit connections, shall be coated with varnish conforming to MIL-V-173, except that:

a. Components and elements inherently inert to fungi or in hermetically sealed enclosures need not be coated.
b. Current-carrying contact surfaces, such as relay contact points, shall not be coated.

3.9 Electromagnetic interference suppression. When specified (see 6.2), the equipment shall conform to the electromagnetic interference suppression requirements and test limits for class C3 equipment as specified in MIL-STD-461.

3.10 Lifting attachments. When specified for type II unit heaters (see 6.2), suitable lifting attachments shall be provided to enable the equipment to be lifted in its normal position as recommended by the manufacturer. Attachments shall withstand any handling conditions encountered, such as rapid lowering and braking of the load. When practicable, only one attachment shall be used. Where more than one is required, each attachment shall be of sufficient capacity to carry the total weight. Information as to the lifting capacity of each attachment shall be stenciled with a contrasting color enamel in a suitable location near the attachment.

3.11 Treatment and painting. Unless otherwise specified (see 6.2), the unit heater shall be treated and painted in accordance with the manufacturer’s standard practice. All surfaces of the unit heater other than corrosion-resisting steel shall be protected against corrosion and present a neat appearance.

3.12 Identification marking. Identification shall be permanently and legibly marked directly on the unit heater or on a corrosion-resisting metal plate securely attached to the unit heater at the source of manufacture. Identification shall include the manufacturer’s model and serial number, name and trademark to be readily identifiable to the manufacturer.

3.13 Workmanship. All parts of the unit heater, including stampings, machined surfaces, and welded parts shall be clean and free from dirt, scale, flux, and other harmful extraneous material. The covers shall be free from rough or cutting edges or sharp objects.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2.1).
b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. The first article inspection shall be performed on one unit heater when a first article is required (see 3.2 and 6.4). This inspection shall include the examination of 4.4 and the tests of 4.5. The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.4, the tests of 4.5.1, 4.5.3, and the packaging inspection of 4.7. This inspection shall be performed on the samples selected in accordance with 4.3.

4.3 Sampling. Sampling and inspection procedures shall be in accordance with MIL-STD-105. The unit of product shall be unit heaters. All unit heaters offered for delivery at one time shall be considered a lot for the purpose of inspection.

4.3.1 Sampling for examination. Examination shall be based on inspection level II and an Acceptable Quality Level (AQL) of 1.5 percent defective for major defects and 2.5 percent defective for minor defects.

4.3.2 Sampling for tests. Test shall be based on inspection level S-4 and AQL of 2.5 percent defective.

4.4 Examination. Each unit selected in accordance with 4.3.1 shall be examined to verify compliance with the requirements of this specification. Examination shall be conducted as specified in table II. Any unit heater in the sample containing one or more defects shall be rejected, and if the number of defective units in any sample exceeds the acceptance number for that sample, the lot represented by the sample shall be rejected. All defective units shall be replaced with non-defective units prior to testing.

TABLE II. Classification of defects.

Categories		Defects	Requirement Paragraph
Critical:		None defined.	
Major:			
	101	Unit heater not type or class specified.	1.2
	102	Operating controls not included as specified.	3.1
	103	Air delivery of type I heater not as specified.	3.1
	104	Type II heater mounting not as specified.	3.1
	105	Heater design not as specified.	3.5
	106	Housing not as specified.	3.6.1
	107	Deflectors, diffusers, and outlets not as specified.	3.6.2
	108	Rigid flange connection not furnished as specified.	3.6.2.2
	109	Heating element not as specified.	3.6.3
	110	Electric motors not as specified.	3.7.1
	111	Electric current supply characteristics other than specified.	3.7.1
	112	Electric controls not as specified.	3.7.2
	113	Control circuits operate at supply voltages exceeding 120V.	3.7.2
	114	Provisions not made to ground all electrical equipment.	3.7.3
	115	Lifting attachments not as specified.	3.10
	116	Workmanship not as specified.	3.13
Minor:			
	201	Fungus resistance not as specified.	3.8
	202	Treatment and painting not as specified.	3.11
	203	Identification marking not as specified.	3.12

4.5 Tests. The first article, when a first article is required, and each sample selected in accordance with 4.3.2, shall be tested. Any unit failing to pass the following tests shall be rejected, and if the number of defective units in any sample exceeds the acceptance number for that sample, the lot represented by the sample shall be rejected. Tests shall be conducted as outlined in the referenced documents as herein specified.

4.5.1 Pressure test. Each heating element, while submerged in water, shall be tested by being subjected to the pneumatic pressure specified in 3.6.3 or 300

psig (2068.43 kPa), whichever is greater. The test temperature shall be 70oF +/-10oF (21.11oC +/-5.56oC). The test pressure shall be applied for a period of not less than manufacturer's normal time. Failure of any pressure-containing part, permanent deformation, or leakage shall be cause for rejection of the heating element.

4.5.2 Performance tests. The unit shall be subjected to a performance test to verify compliance with the capacity requirements specified in 3.5.1. The test shall be conducted and reported in accordance with ASHRAE Standard 33. The test apparatus and instruments shall be of the types and accuracy, including the test methodology, specified in the above standards. Failure of the unit heater to meet the minimum capacity requirements shall be cause for rejection.

4.5.3 Operation test. The unit heater shall be connected to the specified electrical power source and operated for 15 minutes. The propeller (fan wheel), motor, controls, when applicable, and accessories, shall be inspected during the test. Any excessive vibration, overheating, or loose parts shall be cause for rejection of the unit.

4.6 Measurement of electromagnetic suppression. To determine conformance to the electromagnetic interference suppression of 3.9, electromagnetic radiation shall be measured in accordance with MIL-STD-462 UM05.

4.7 Preparation for delivery inspection. The preservation, packaging, packing, and marking of the units shall be inspected to verify compliance with the requirements of section 5 of this specification.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or commercial as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Methods of preservation. Cleaning processes, drying procedures, preservatives, and methods of preservation specified in the following paragraphs are listed in MIL-P-116 and shall conform to the requirements of MIL-P-116 and any applicable specifications.

5.1.1.2 Cleaning and drying. Prior to the application of preservative compounds or paint, surfaces shall be cleaned by process C-1 and dried by any applicable procedure of MIL-P-116.

5.1.1.3 Unprotected surfaces. Unpainted ferrous metal surfaces, including threaded surfaces, shall be coated with type P-21 preservative in accordance with MIL-P-116. Care should be taken not to coat fins, coils, or other areas that would impair the heat transfer capabilities of the equipment.

5.1.1.4 Accessories. Accessories shall be preserved and packaged method I or III as applicable in accordance with MIL-P-116.

5.1.1.5 Heating element. The heating element supply and return connections shall be sealed with type I, grade A, barrier material conforming to MIL-B-121 and secured with pressure-sensitive tape.

5.1.2 Commercial. The heaters shall be preserved and packaged in accordance with ASTM D 3951.

5.2 Packing. Packing shall be level A, B, or commercial as specified (see 6.2).

5.2.1 Levels A and B. Packing shall be in accordance with MIL-STD-2073-1. Containers shall be selected from Appendix C, Table VII for the appropriate level.

5.2.2 Commercial. The heaters shall be packed in accordance with ASTM D 3951.

5.3 Marking.

5.3.1 Military agencies. Shipments to military agencies shall be marked in accordance with MIL-STD-129.

5.3.2 Civil agencies. Shipments to civil agencies shall be marked in accordance with FED-STD-123.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Unit heaters are intended for the heating of air to balance heat losses in rooms or buildings. Compared with other types of heating systems, unit heaters (a) are usually lower in first cost; (b) are more easily controlled, either manually or thermostatically; (c) provide air circulation without heating during summer months.

6.1.1 Operating controls. Normally, operating controls are obtained separately from the basic unit in order to be procured at lower cost (see 3.1 and 6.2). Characteristics of thermostats include such items as electric voltage, pneumatic pressure range, on-off control, proportional control, heating and ventilation, heating only, temperature range, night set-back.

6.1.2 Heating element. When an extremely saline atmosphere exists, manufacturers should be consulted for the availability of suitable corrosion-resistant material (see 3.6.3 and 6.2). Cast iron elements are available that resist external corrosion and are rated at 250 psig pressure.

6.2 Ordering data. Acquisition documents should specify the following:

a. Title, number, and date of this specification
b. Type and class of unit heater required (see 1.2 and 3.6.1)
c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2)
d. When operating controls shall be included (see 3.1)
e. Direction for air delivery on type I heater (see 3.1)
f. Style of mounting required for type II heater (see 3.1)
g. When first article is required for inspection and approval (see 3.2)

h. The specific design conditions and capacity listed in table I (see 3.5)
i. When maximum design pressure shall be other than 150 psig (1034.21 kPa) (see 3.5)
j. Capacity of heater in Btu/h (W) (see 3.5.1)
k. Deflectors for type I heater, if different (see 3.6.2.1)
l. When vertical heater discharge is different (see 3.6.2.1)
m. When nozzles or louvers need not be furnished on type II heater (see 3.6.2.2)
n. Specific air flow discharge direction required for outlets (see 3.6.2.2)
o. When housing for type II heater is required to have a rigid flange for connection to an air intake duct (see 3.6.2.2)
p. When material for heating element tubes is different (see 3.6.3 and 6.1.2)
q. Electrical supply volts, phase, frequency (see 3.7.1)
r. When motor is to be single speed or multi-speed, with number of speeds (see 3.7.1)
s. When motor is to be totally enclosed fan cooled type (see 3.7.1)
t. Whether manual or automatic control is required, and if automatic, whether modulating or on-off control is required (see 3.7.2 and 3.7.2.2)
u. Whether automatic control is to be pneumatic powered or electrical powered (see 3.7.2)
v. Whether manual or magnetic starter is required (see 3.7.2)
w. Electrical enclosures, if different (see 3.7.2)
x. Supply thermostat characteristics (see 3.7.2.2 and 6.1.1)
y. When fungus-resistance is required (see 3.8)
z. When electromagnetic interference suppression is required (see 3.9)
aa. When lifting attachments are required (see 3.10)
bb. Treatment and painting and color of finish coat, if different (see 3.11)
cc. Level of preservation and packing required (see 5.1 and 5.2)

6.3 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (DD Form 1423) incorporated into the contract. When the provisions of DoD Federal Acquisition Regulations (FAR) Supplement, Part 27, Sub-Part 227.405-70 are invoked and the DD Form 1423 is not used, the data should be delivered by the contractor in accordance with the contract or purchase order requirements.

6.4 First article. When a first article inspection is required, the item will be tested and should be a first article sample or it may be a standard production item from the contractor’s current inventory as specified in 4.2.1. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.5 Part or identification number (PIN). A PIN has been established for use to identify the classified item for acquisition (see 1.2). The PIN consists of the document identifier (SU2833) and a PIN code number (see 6.5.1) for the different options for acquisition.

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SU2833 -   XX
  *         *
  *         *--------------------  Type and class code number (see 6.5.1)
  *
  *------------------------------  Document identifier
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6.5.1 Type and class. The type and class of the unit heater (see 1.2) are identified by a two-digit code number (see table III).

TABLE III. Code number to type and class.

Type and class	Code number
Type I Class 1	11
Type I Class 2	12
Type II Class 1	21
Type II Class 2	22

6.6 Subject term (key word) listing.

Electric-motor-driven

6.7 Supersession data. This specification replaces military specification MIL-U-17691D, dated 23 May 1988.

6.8 Classification cross-reference. Classifications used in this specification (see 1.2) are identical to those found in the superseded military specification, MIL-U-17691D.

MILITARY INTERESTS:

Custodians

Navy - YD1
Air Force - 99

Review Activities

Air Force - 84
DLA - CS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

PREPARING ACTIVITY:

Navy - YD1

(Project 4520-0362)