

INCH-POUND

A-A-50543  
September 30, 1993  
SUPERSEDING  
MIL-H-18551C  
20 July 1983

## COMMERCIAL ITEM DESCRIPTION

## HEATERS, CONVECTION, STEAM OR HOT WATER

This Commercial Item Description (CID) is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. Abstract. This CID covers coil or cast finned-tube heaters (convectors) of the natural-air-circulation type, operated with steam or hot water to supply heated air in individual rooms of residences, offices, etc. Types, classes, styles, models and sizes are as follows:

Type I - Nonferrous heating element.  
Type II - Ferrous heating element.

Class 1 - Nonrecessed.  
Class 2 - Recessed.

Style A - Floor-mounted (free-standing).  
Style B - Wall-mounted.

Model F - Front air outlet.  
Model T - Top air outlet.  
Model S - Side, front, and top air outlet, perforated metal construction.

Size 14 - Overall height of 14 inches (355.60 millimeters (mm)).  
Size 16 - Overall height of 16 inches (406.40 mm).  
Size 18 - Overall height of 18 inches (457.20 mm).  
Size 20 - Overall height of 20 inches (508.00 mm).  
Size 22 - Overall height of 22 inches (558.50 mm).

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.
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Size 24 - Overall height of 24 inches (609.60 mm).  
Size 26 - Overall height of 26 inches (660.40 mm).  
Size 28 - Overall height of 28 inches (711.20 mm).  
Size 30 - Overall height of 30 inches (762.00 mm).  
Size 32 - Overall height of 32 inches (812.80 mm).

## 2. Salient characteristics.

2.1 Description. The heaters, convection, steam or hot water (referred to herein as "heaters") shall be a self-contained, factory-assembled unit, consisting of tubes, expanded surfaces (fins), headers, when required, and an enclosure. The enclosure shall be of either the cabinet or section type (see 2.3.5). The heating element shall have provisions for connections to steam or hot-water piping, as specified (see 6.1).

2.2 Capacity. The heater shall have a capacity in British thermal units per hour (Btu/hr) (watt) not less than that specified when operated with steam or hot water at the temperature and pressure specified (see 6.1). The capacity shall be based on an entering air temperature of 65 degrees Fahrenheit (degrees F) (18.35 degrees Celsius (degrees C)). Unless otherwise specified (see 6.1), the maximum surface temperature of the enclosure shall be 175 degrees F (79.44 degrees C).

2.3 Design and construction. The heaters shall be designed to withstand, without deformation, leakage, or damage, a minimum hydrostatic test pressure of 100 pounds per square inch gage (psig) (689.47 kilopascals (kPa) (gage)). The design shall be such as to prevent conditions which may be hazardous to personnel or deleterious to equipment. All necessary brackets and fasteners for mounting style B heaters shall be furnished. Unless otherwise specified (see 6.1), the heaters shall be tapped at opposite ends.

2.3.1 Heating element. The heating element shall consist of headers, when required, and of expanded-metal (finned) tubes.

2.3.2 Tubes and fins. Tubes and fins shall be suitable for the heating medium and conditions as specified herein. Tubes shall be considered a primary heating surface and shall be copper, brass, manganese, steel, or aluminum. Fins shall be considered a secondary heating surface and shall be copper, steel, or aluminum. The fins shall be continuously bonded to the tubes to insure a tight, rigid, metal-to-metal contact under specified operating conditions. The fins shall have a uniform pitch, be in a plane perpendicular to the centerline of the pipe, and have smooth surfaces, free from wrinkles or kinks, except that die-formed fins curved to increase turbulence will be acceptable. Orifices or baffle plates of proper size shall be provided when required to insure uniform distribution of the heating medium to each tube. Tubes shall be arranged to minimize expansion and contraction stresses.

2.3.3 Headers. Headers, when required, shall be cast iron, cast brass, steel tubing, steel pipe, steel plate, or copper tubing. Finned tubes shall be mechanically bonded to cast iron, steel tube, or copper tube headers but may be brazed or welded to steel pipe or steel plate headers. When headers are used on hot water systems the water velocity shall be not less than 1 foot per second (0.30 meter per second) through the finned tubes.

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2.3.4 Air chamber and venting device. When the heating medium is not water, the highest point of the heating element shall be provided with an air chamber and with a manual venting device operable without removal of any part of the heater. When specified (see 6.1), an automatic venting device shall be furnished.

2.3.5 Enclosure. The heating element shall be completely enclosed in a sheet steel cabinet or section type enclosure. Proper rigidity shall be accomplished by configuration design, bracing, or reinforcing. Horizontal tubes shall have a pitch with respect to the enclosure for proper drainage. Trappings of condensate in steam systems or air in hot-water systems shall be avoided. Unless otherwise specified (see 6.1), dimensions other than the height (see 1) shall be at the manufacturer's option. When specified (see 6.1), the air-outlet opening shall be equipped with a readily adjustable damper.

2.3.5.1 Cabinet type. The cabinet type enclosure shall be sheet metal not less than 18 gage (0.0478-inch (1.21 mm) nominal thickness) for top and front and not less than 20 gage (0.0359-inch (0.91 mm) nominal thickness) for sides and back. When galvanized, the nominal thickness shall be 0.050-inch (12.70 mm) and 0.0375-inch (0.95 mm), respectively. The front panel shall be readily removable to allow access to the heating element.

2.3.5.2 Section type. The section type enclosure shall be metal having a thickness of not less than 20 gage (0.0359-inch (0.91 mm) nominal) and so formed as to increase the strength of the material. The section shall be bonded to the tube or primary surface and shaped to form a flue. The enclosure shall have proper configuration to prevent accumulation of dirt and other foreign matter. Inlet and outlet air grilles and fin spacing shall be designed for proper air velocity.

2.3.5.3 Model F, T, and S. Model F and model T shall be provided at the bottom of the enclosure with air inlet openings that need not be grilled, and with a grilled air outlet at or near the top. Model S enclosures shall be provided with a perforated metal housing covering the front, top, and sides.

2.4 Commercial manual. When specified (see 6.1), a commercial off-the-shelf manual with parts list shall be provided for each convection heater.

3. Regulatory requirements. The offerer/contractor is encouraged to use recovered materials in accordance with Public Law 94-580 to the maximum extent practical.

4. Quality assurance.

4.1 Contractor certification. The contractor shall certify and maintain substantiating evidence that the product offered meets the salient characteristics of this CID and that the product conforms to the producer's own drawings, specifications, standards, and quality assurance practices. The Government reserves the right to require proof of such conformance prior to first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

4.2 Metric Products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units,

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provided they fall within tolerances specified using conversion tables contained in the latest revision of FED-STD-376, and all other requirements of this document are met. If a product is manufactured to metric dimensions and those dimensions exceed the tolerances specified in the inch-pound units, a request should be made to the specification preparing activity for changes to this document.

5. Packaging. Unless otherwise specified in the contract or order (see 6.1), the preservation, packing, and marking shall be in accordance with ASTM D3951.

6. Notes.

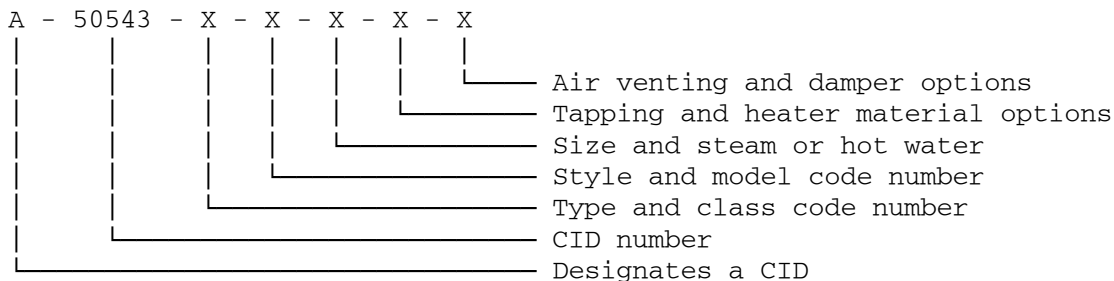
6.1 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this CID.
- b. Type, class, style, model, and size of heater required (see 1).
- c. Whether a steam or hot water system shall be used (see 2.1).
- d. Capacity in Btu/hr (watt) and values of steam pressure (psig) (kPa (gage)), or entering water temperature (OF) (OC) and water pressure (psig) (kPa (gage)), as applicable; and enclosure surface temperature, if other than as specified (see 2.2).
- e. When tapping location is other than as specified (see 2.3).
- f. When an automatic venting device is required (see 2.3.4).
- g. Maximum enclosure dimensions and adjustable damper, when required (see 2.3.5).
- h. When commercial manual shall be provided (see 2.4).
- i. When preservation, packaging, packing, and marking is to be other than as specified (see 5).

6.2 Source of documents. Copies of Federal and military documents are available from Standardization Documents order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

6.3 Source for non-Government association documents. ASTM D3951 is available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

6.4 CID-based-part identification numbers. The following part identification numbering procedure is for Government purposes and does not constitute a requirement for the contractor.



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6.4.1 Type and class. The type and class of heater units are identified by a single number (see table I).

TABLE I. Type and class.

Type	Class	
	Class I Nonrecessed	Class 2 Recessed
Type I - Nonferrous heating element	1	2
Type II - Ferrous heating element	3	4

6.4.2 Style and model. The style and model of heater units are identified by a single number (see Table II).

TABLE II. Style and model.

Model	Model	
	Style A Floor-mounted	Style B Wall-mounted
Model F - Front air outlet	1	2
Model T - Top air outlet	3	4
Model S - Side, front, and top outlet (perforated metal construction)	5	6

6.4.3 Size and steam or hot water. The size and heating medium option of heater units are identified by a single letter (see table III).

TABLE III. Size and heating medium.

Size	Heating Medium	
	Steam	Hot Water
Size 14 overall height of 14 inches (355.60 mm)	A	L
Size 16 overall height of 16 inches (406.40 mm)	B	M
Size 18 overall height of 18 inches (457.20 mm)	C	N
Size 20 overall height of 20 inches (508.00 mm)	D	P
Size 22 overall height of 22 inches (558.80 mm)	E	R
Size 24 overall height of 24 inches (609.60 mm)	F	S
Size 26 overall height of 26 inches (660.40 mm)	G	T
Size 28 overall height of 28 inches (711.20 mm)	H	U
Size 30 overall height of 30 inches (762.00 mm)	J	V
Size 32 overall height of 32 inches (812.80 mm)	K	X

6.4.4 Tapping and header material. The tapping location and header material of heater units are identified by a single letter (see table IV).

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TABLE IV. Tapping and header material.

Header Material	Tapping Location		
	Both right	Both left	Opposite ends
Cast Iron	A	G	N
Cast Brass	B	H	P
Steel Tubing	C	J	R
Steel Pipe	D	K	S
Steel Plate	E	L	T
Copper Tubing	F	M	U

6.4.5 Air venting and damper option. The air venting and damper option of heater units are identified by a single number (see table V).

TABLE V. Air venting and damper.

Air Venting	Damper	
	With damper	Without damper
Manual Air venting	1	2
Automatic air venting	3	4

6.4.6 Supersession data. This CID replaces military specification MIL-H-18551C dated 20 July 1983.

6.5 Classification cross reference. Classifications used in this CID (see 1) are identical to those found in the superseded military specification, MIL-H-18551C.

## MILITARY INTERESTS:

Custodians

Navy - YD1

Air Force - 99

Review Activities

Army - CE

Navy - MC

DIA - CS

## CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

## PREPARING ACTIVITY:

Navy - YD1

(Project 4520-0340)