

[INCH-POUND]

A-A-60001

June 17, 1997

SUPERSEDING

WW-T-696E

May 21, 1984

## COMMERCIAL ITEM DESCRIPTION

### TRAPS, STEAM

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 traps for draining water and other condensate, for removing air and other gases from pipelines and equipment, and other applications (see 7.1).
2. **CLASSIFICATION.** Traps shall be of the following types, styles, classes and size as specified (see 7.3).

- Type I - Trap, bucket
  - Style A - Open bucket
  - Style B - Inverted bucket
- Type II - Trap, ball float
- Type III - Trap, disk, thermodynamic
- Type IV - Trap, orifice or impulse
- Type V - Trap, thermostatic
  - Style A - Bellows or membrane
  - Style B - Bimetallic element
- Type VI - Trap, combination float and thermostatic

- 2.1 **Class.** Traps shall be of the following classes based on maximum working pressure range and steam temperature range, as specified (see 7.3):

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: Commanding Officer (Code 15E2), 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.

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	Working pressure range Pounds-force per square inch (psig) (kilopascal (kPa))	Steam temperature range Degrees Fahrenheit ( °F) (Celsius ( °C))
Class 1	Vacuum to 15 psig (Vacuum to 103.4 kPa)	212 °F to 250 °F (100 °C to 121 °C)
Class 2	0 to 25 psig (0 to 172.4 kPa)	212 °F to 267 °F (100 °C to 131 °C)
Class 3	0 to 65 psig (0 to 448.2 kPa)	212 °F to 312 °F (100 °C to 156 °C)
Class 4	0 to 125 psig (0 to 861.8 kPa)	212 °F to 400 °F (100 °C to 204 °C)
Class 5	0 to 150 psig (0 to 1034.2 kPa)	212 °F to 400 °F (100 °C to 204 °C)
Class 6	0 to 200 psig (0 to 1379.0 kPa)	212 °F to 400 °F (100 °C to 204 °C)
Class 7	0 to 250 psig (0 to 1723.7 kPa)	212 °F to 450 °F (100 °C to 232 °C)
Class 8	0 to 300 psig (0 to 2068.4 kPa)	212 °F to 600 °F (100 °C to 316 °C)
Class 9	0 to 600 psig (0 to 4136.9 kPa)	212 °F to 750 °F (100 °C to 399 °C)

2.2 Size. The size of trap shall be the nominal pipe size (NPS) of the inlet as specified (see 7.3).

### 3. SALIENT CHARACTERISTICS.

3.1 Description. When used in steam lines and steam heated equipment, traps are intended to release condensate and air or gas and hold back live steam. Applications for the various types of traps covered by this CID include:

- a. Draining water from steam lines and steam heated equipment.
- b. Draining water from compressed air systems due to condensation in intercooler and line.
- c. Venting air from steam lines and steam heated equipment resulting from using fresh water in boiler and the vacuum formed when steam is off.
- d. Draining liquids of various specific gravities and viscosities from lines of gases.

3.2 Standard commercial product. The steam trap assembly shall, as a minimum, be in accordance with the requirements of this commercial item description and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this commercial item description but which are a part of the manufacturer's standard commercial product, shall be included in the steam trap being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market.

3.3 Design and construction. The design and construction of traps shall be fully compensated and suitable for operation over the entire pressure temperature range for the class and the capacity. For types I through VI, the design shall be either such that the valve and seat (replaceable type), linkage, screens, gaskets, and other components shall be capable of being removed and replaced in service without requiring special tools, skills, adjustments, or be nonrepairable permanently sealed units. Unless otherwise specified (see 7.3), type I through VI traps may fail either in the open or closed position at the manufacturers option. Unless otherwise specified (see 7.3), all traps, except type V class 1 through 5, shall be furnished with female threaded inlet and outlet connections of the same size.

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## 3.3.1 Type I traps.

3.3.1.1 Style A. Type I, style A traps shall consist of a body, cover, an upright bucket mechanism, and a replaceable head and seat. The bucket mechanism shall be capable of discharging condensate and retaining steam over the entire specified pressure designated for the class. Inlet and outlet connections shall be in the horizontal or vertical plane, as specified (see 7.3).

3.3.1.2 Style B. Type I, style B traps shall either be repairable units consisting of a body, a cover, an inverted bucket mechanism, and a replaceable head and seat or be nonrepairable permanently sealed units. The bucket mechanism shall be capable of discharging condensate and retaining steam over the entire specified pressure designated for the class. Traps shall be fitted with a vent hole capable of removing air during startup. When specified (see 7.3), traps shall be fitted with auxiliary air vents. Inlet and outlet connections shall be in the horizontal or vertical plane, as specified (see 7.3).

3.3.1.3 Strainer, type I traps. When specified (see 7.3), type I traps shall be furnished with an integral strainer.

3.3.2 Type II traps. Type II traps shall either consist of a body, cover, replaceable head and seat, and an integral ball float mechanism capable of modulating the discharge of condensate over the specified pressure class or be a nonrepairable permanently sealed unit. When specified (see 7.3), the traps shall be fitted with drain plugs. To ensure a liquid seal, the design of type II traps shall be such that the liquid level is always over the valve orifice or seat. When specified (see 7.3), traps shall be provided with a female threaded connection to accept an equalizing line.

3.3.3 Type III traps. Type III traps shall consist of a body, cover, and hardened seat, and disk capable of removing condensate from a steam system ranging from 10 pounds per square inch (psi) (68.9 kilopascal (kPa)) through 600 psi (4136 kPa). The trap shall be capable of closing tight when subjected to steam.

3.3.3.1 Strainer, type III traps. When specified (see 7.3), type III traps shall be furnished with an integral strainer.

3.3.4 Type IV traps. Type IV traps shall consist of a body, cover, replaceable head and seat, and be capable of removing condensate and air from a steam system ranging from 10 psi (68.9 kPa) through the pressure class specified. The traps shall be so designed that the maximum steam loss shall not be greater than 20 pounds (lb) (9.0 kilograms (kg)) of steam per hour.

3.3.5 Type V traps. Type V traps, styles A and B shall be repairable units consisting of a body, cover, and a replaceable or renewable valve and seat. The valve shall be attached to a bellows, diaphragm, or bimetallic element capable of closing the valve to steam and opening to condensate and air throughout the pressure class. The diaphragm or bellows shall be sealed and shall be filled with a fluid that expands and contracts the element which, in turn, closes the valve to steam and opens it to air and condensate. Bellows and diaphragm types shall be limited to applications of

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not greater than 300 psi (2069 kPa), and 425 °F (218 °C). Unless otherwise specified (see 7.3), the inlet and outlet connections for classes 1 through 5 traps shall be of the same size and have a male union tailpiece on the inlet connection and female threaded on the outlet connection.

3.3.5.1 Strainer type V traps. When specified (see 7.3), type V traps shall be furnished with an integral strainer.

3.3.6 Type VI traps. Type VI traps shall consist of a body, cover, replaceable valve and seat, and either a ball float valve mechanism capable of modulating the condensate discharge or a bucket float mechanism capable of discharging condensate throughout the pressure class specified. A separate diaphragm, bellows, or mechanism shell be incorporated in the design to vent air throughout the pressure class specified. The valve shall shut tight to steam and open to condensate and air. The design shall be such that the condensate valve and seat are water-sealed at all times. When specified (see 7.3), the trap shall contain a drain plug at the lowest point to remove condensate when required.

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. 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 are allowed under this specification unless otherwise specified.

3.4.1 Composition of strainer screens. When specified (see 7.3), strainer screens shall be made either from brass conforming to ASTM B 36, nickel copper alloys conforming to ASTM B 127, or corrosion resisting steel (CRES), type 304 or 316 conforming to ASTM A 240.

3.4.2 Gaskets. Unless otherwise specified (see 7.3), gaskets for cover and flanges shall be the manufacturer's standard commercial product.

3.5 Inlet and outlet connections. Unless otherwise specified (see 7.3), inlet and outlet trap connections shall be NPS, and connections shall be supplied as specified in 3.3, 3.3.1.1, 3.3.1.2, and 3.3.5.

3.5.1 Threaded pipe connections. All threaded pipe connections shall conform to ANSI B 1.20.1.

3.5.2 Union connection. Traps with union connections shall be furnished complete with nuts and tailpieces.

3.5.3 Flange connections. Flanges shall be in accordance with ANSI B 16.5.

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3.5.4 Socket-welding connection. Welded connection shall be in accordance with ANSI B 16.11.

3.6 Valve seat facing. The seating surface of traps having removable seats shall be made of corrosion and erosion-resistant materials, and have a hardness of not less than 250 Brinell for classes 1 through 6, and 500 Brinell for classes 7 through 9.

3.7 Interchangeability. All traps of the same type, style, class, size, and manufacture furnished under a specific contract shall be identical to the extent necessary to ensure interchangeability of component parts, assemblies, accessories, and spare parts.

3.8 Air cock. When specified (see 7.3), traps shall be fitted with an air cock for testing and venting of air from the trap.

3.9 Antifouling. Traps shall be designed to prevent fouling by accumulated sediment, scale, and nonvolatile, insoluble foreign matter such as oil and grease. When specified (see 7.3), traps shall be provided with drain plugs or cocks to facilitate flushing.

3.10 Identification marking. The manufacturer's name, trademarks or designating symbol, the direction of flow and the pipe size, as applicable, shall be legibly cast, stamped, or suitably affixed to the body or cover. The maximum working pressure for traps shall be stamped or marked legibly on the trap body or cap. Replacement components shall be similarly marked or tagged.

3.11 Performance requirements for traps.

3.11.1 Capacity of traps. The capacity of traps shall be as specified (see 7.3). The capacity shall be expressed in lb of condensate discharged continuously per hour under specified conditions of pressure differentials the inlet pressure minus the discharge pressure, and at the discharge temperature depression listed in table II. Unless otherwise specified (see 7.3), the condensate temperature depression for type V traps shall be 20 °F ( 11 °C) as specified in table II.

TABLE II. Condensate temperature depressions.

Type Trap	Maximum temperature depression <sup>1/</sup> °F (°C)
Type I	5 (2.8)
Type II	5 (2.8)
Type III	5 (2.8)
Type IV	30 (17)
Type V	20 (11)
Type VI	5 (2.8)

<sup>1/</sup> For purposes of this specification, temperature depression is defined as the  $\Delta$  °F (°C) below saturated steam temperature corresponding to the inlet pressure specified.

3.11.2 Operation of trap. The traps shall be capable of discharging condensate and closing to steam throughout the pressure class specified. The trap shall operate automatically and regularly at both maximum pressure and at 10 percent of the maximum pressure.

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3.11.3 Steam loss. Steam loss of traps shall be not greater than 2 lb. (0.9 kg) per hour except for type IV traps, which shall be not greater than 20 lb. (9.0 kg) per hour.

3.11.4 Hydrostatic pressure requirement. Traps shall be capable of withstanding a hydrostatic pressure of 150 percent of the maximum working pressure of the class for a duration of 5 minutes.

3.12 Exterior finish. Brass, bronze, or stainless steel bodies and covers or bonnets shall be furnished in natural finish or shall be electroplated when specified (see 7.3). Unless otherwise specified (see 7.3), iron and steel exteriors shall be treated and painted in accordance with the manufacturer's best standard practice.

3.13 Workmanship. The quality of workmanship shall be such as to produce traps that are in accordance with the requirements of this CID and ensure proper functioning of all parts of the unit.

3.13.1 Castings. All castings shall be sound and free from patching, misplaced coring, warping, or other defect which reduces the casting's ability to perform its intended function.

3.13.2 Welds. Welds shall be continuous, sound, smooth, and free from closely spaced in line surface porosity, cracks, incomplete fusion, or deformation of material.

3.13.3 Machined work. Machined surfaces shall conform to good commercial practice to ensure proper functioning, interchangeability, and long life. The surface roughness of flange gasket facings shall be not more than 125 micro-inches (3.2 micrometre) in accordance with ANSI B16.5.

#### 4. REGULATORY REQUIREMENTS.

4.1 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). Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this commercial item description 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. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products are allowed under this commercial item description.

4.2 Metric products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units, provided they fall within specified tolerances using conversion tables contained in the latest version of ASTM E 380, and all other requirements of this commercial item description including form, fit and function are met. If a product is manufactured to metric dimensions and those dimensions exceed the tolerances specified in the

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inch-pound units, a request should be made to the contracting officer to determine if the product is acceptable. The contracting officer has the option of accepting or rejecting the product.

## 5. QUALITY ASSURANCE PROVISIONS.

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

6. PACKAGING. The preservation, packing, and marking shall be as specified in the contract or order.

## 7. NOTES.

7.1 Trap limitations. When traps are selected, the following limitations on the various types of traps should be considered:

a. Type I, bucket trap.

- (1) Trap will not operate where a continuous water seal cannot be maintained.
- (2) Must be protected from freezing.
- (3) Air handling capacity not as great as type VI traps.

b. Type II, ball float trap.

- (1) Must be protected from freezing.
- (2) Operation of some models may be affected by water hammer.
- (3) Primary application is as a liquid drainer or air vent.

c. Type III, disk trap.

- (1) Not suitable for pressures below 10 psi (68.9 kPa).
- (2) Not recommended for back pressures greater than 50 percent of inlet pressure.

d. Type IV, impulse or orifice trap.

- (1) Not recommended for systems having back pressure greater than 50 percent of the inlet pressure.
- (2) Not recommended where subcooling temperature is 30° F (17° C) below the saturated steam pressure.
- (3) Should not be used where efficiency is a factor.

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- e. Type V, thermostatic trap.
  - (1) Limited to applications in which condensate can be held back and subcooled before being discharged.
  - (2) Operation of some models may be affected by water hammer.
  - (3) Diaphragm and bellows types are limited to applications of 300 psi (2068.4 kPa) and 425° F (218.3° C) maximum.
  
- f. Type VI combination trap.
  - (1) Cannot be used on superheated steam systems.
  - (2) Must be protected from freezing.
  - (3) Operation of some models may be affected by water hammer.

7.2 Source of documents.

7.2.1 The Federal Acquisition Regulation (FAR) and Code of Federal Regulations (CFR) may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

7.2.2 ASTM Standards are available from American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

7.2.3 ANSI Standards are available from American National Standards Institute, 11 West 42nd Street, New York, NY 10036.

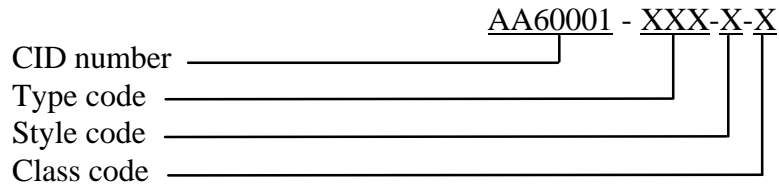
7.3 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this CID.
- b. Type, style, class, and size required (see 2., 2.1 and 2.2).
- c. If traps required to fail at other than the manufacturers option (see 3.3).
- d. Size and plane of inlet, outlet, and other connections required (see 3.3, 3.3.1.1, 3.3.1.2 and 3.3.5).
- e. When auxiliary air vents are required (see 3.3.1.2).
- f. If integral strainer is required on type I, type III and type V traps (see 3.3.1.3, 3.3.3.1 and 3.3.5.1).
- g. When drain plugs or cocks are required (see 3.3.2, 3.3.6 and 3.9).
- h. Material and composition of strainer screens (see 3.4.1).
- i. If special gaskets are required (see 3.4.2).
- j. If end connections are different (see 3.5).
- k. If an air cock is required (see 3.8).
- l. Capacity of trap required and if a greater than 20 °F (11 °C ) temperature depression is desired for type V traps (see 3.11.1).
- m. If special exterior finish of treatment or paint is required (see 3.12).
- n. When equalizing connectors are required (see 3.3.2).



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7.4 Part Identification Number (PIN). The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor. The PIN to be used for items acquired to this description are created as follows:

7.4.1 Example of PIN.

Example 1. Inverted bucket steam trap, 0-150 psig (0 to 1 034.2 kPa),  
212 °F to 400 °F (100 °C to 204 °C)  
PIN designation: AA60001-I B 5

Example 2. Disk steam trap, 0-25 psig (0 to 172.4 kPa), 212 °F to 267 °F  
(100 °C to 131 °C)  
PIN designation: AA60001-III 2

MILITARY INTERESTS:Custodians:

Army - CE  
Navy - YD1  
Air Force - 99

Review Activities:

Navy - SH  
DLA - CS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

Preparing Activity:

Navy - YD1

(Project 4730-0676)

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

### I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER  
A-A-60001

2. DOCUMENT DATE (YYMMDD)  
970617

3. DOCUMENT TITLE TRAPS, STEAM

### 5. REASON FOR RECOMMENDATION

### 6. SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)  
(1) Commercial  
(2) AUTOVON  
(if applicable)

7. DATE SUBMITTED  
(YYMMDD)

### 8. PREPARING ACTIVITY

a. NAME

Russell Reynolds

b. TELEPHONE (Include Area Code)

(1) Commercial  
(805) 982-5846

(2) AUTOVON  
551-5846

c. ADDRESS (Include Zip Code)

COMMANDING OFFICER, NCBC, CODE 15E2C  
1000 23<sup>RD</sup> AVENUE  
PORT HUENEME, CA 93043-4301

**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:**

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5203 Leesburg Pike, Suite 1403, Falls Church, VA 22401-3466  
Telephone (703) 756-2340 AUTOVON 289-2340