

**84.18 - Refrigerators, freezers and other refrigerating or freezing equipment, electric or other; heat pumps other than air conditioning machines of heading 84.15.**

- 8418.10 - Combined refrigerator-freezers, fitted with separate external doors
  - Refrigerators, household type :
- 8418.21 -- Compression-type
- 8418.29 -- Other
- 8418.30 - Freezers of the chest type, not exceeding 800 l capacity
- 8418.40 - Freezers of the upright type, not exceeding 900 l capacity
- 8418.50 - Other furniture (chests, cabinets, display counters, show-cases and the like) for storage and display, incorporating refrigerating or freezing equipment
  - Other refrigerating or freezing equipment; heat pumps :
- 8418.61 -- Heat pumps other than air conditioning machines of heading 84.15
- 8418.69 -- Other
  - Parts :
- 8418.91 -- Furniture designed to receive refrigerating or freezing equipment
- 8418.99 -- Other

**(I) REFRIGERATORS, FREEZERS AND OTHER REFRIGERATING OR FREEZING EQUIPMENT**

The refrigerators and refrigerating equipment of this heading are in the main machines or assemblies of apparatus for the production, in a continuous cycle of operations, of low temperatures (in the region of 0 °C or less) at the active cooling element, by the absorption of the latent heat of evaporation of liquefied gases (e.g., ammonia, halogenated hydrocarbons), of volatile liquids or, in the case of certain marine types, of water.

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The heading therefore **excludes** :

- (a) Freezing-salt type freezers (**heading 82.10 or 84.19**).
- (b) Water-flow coolers of the simple heat-exchange type (see the Explanatory Note to **heading 84.19**).
- (c) Ice-chests, insulated cabinets, etc., not designed for fitting with refrigerating units (generally **heading 94.03**).

The refrigerators of this heading are of two main types :

### (A) COMPRESSION TYPE REFRIGERATORS

Their essential elements are :

- (1) **The compressor** which receives expanded gas from the evaporator and delivers it under pressure to
- (2) **The condenser** or liquefier where the gas is cooled and liquefied, and
- (3) **The evaporator**, the active cooling element, consisting of a tubular system in which the condensed refrigerant, released through an expansion valve, evaporates rapidly with the absorption of heat from the surrounding air or, in the case of large cooling installations, from brine or a solution of calcium chloride kept in circulation around the evaporator coils.

In the marine type there is no compressor and condenser in the refrigerant (water or brine) circuit, but the evaporation is induced by a vacuum produced by an ejector pump working with a steam condenser. The latter condenses and disposes of the vapours produced, which are not returned to the system.

### (B) ABSORPTION TYPE REFRIGERATORS

In these the compressor is replaced by a "generator" in which a strong aqueous solution of ammonia is heated (by gas, oil or electric element), the gas being driven off and accumulating under pressure in the condenser. The cycle of condensation followed by expansion and cooling in the evaporator continues as in the compressor type, the expanded gas being re-dissolved in the weakened solution, either in a separate absorber which feeds the generator by simple pressure effect or through a pump, or in the generator itself which, in certain types, functions as the absorber on cooling during periods when the heat is withdrawn.

In certain dry types the ammonia gas is absorbed by a solid (e.g., calcium chloride or silica-gel) instead of being in solution.

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Apparatus of the foregoing kinds are classified in this heading if in the following forms :

- (1) Units comprising a compressor (with or without motor) and condenser mounted on a common base, whether or not complete with evaporator; or self-contained absorption units. (These units are commonly fitted into domestic-type refrigerators or other refrigerating cabinets.) Certain compression type machines, known as "liquid-cooling units", combine on a common base (with or without condensers), compressors and a heat exchanger containing an evaporator and tubing carrying the liquid to be cooled. These latter machines include those known as "chillers", which are used in air conditioning systems.
- (2) Cabinets or other furniture or appliances incorporating a complete refrigerating unit or an evaporator of a refrigerating unit, whether or not equipped with ancillary devices such as agitators, mixers, moulds. These appliances include domestic refrigerators, refrigerated show cases and counters, ice-cream or frozen food storage containers, refrigerated water or beverage fountains, milk cooling vats, beer coolers, ice-cream makers, etc.
- (3) Refrigerating installations of larger type consisting of components which are not mounted on a common base or as self-contained units but are designed to operate together, either by direct expansion (an evaporator then being incorporated in the "cold-using" appliance), or by means of a refrigerating medium (brine) which is cooled by a refrigerating unit and piped into the "cold-using" appliances (indirect cooling). Such installations are used, for example, in cold storage plants and for manufacturing operations (manufacture of block ice, quick-freezing of food products, rapid chilling in chocolate manufacture, separating paraffin wax in petroleum refining, in chemical industries, etc.).

Ancillary apparatus essential to the application of the low temperature produced in such installations are classified in this heading **provided** they are presented together with the other components of these installations. Such apparatus include, for example, sectional or tunnel-type quick freezers, cold tables for confectionery or chocolate, etc.

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This heading also includes refrigerating equipment operating by vaporisation of liquefied gas in an enclosed space and consisting generally of one or more liquefied-gas tanks, a thermostat, an electro-magnetic valve, a control box and electric switches and a perforated spreader tube. These components are classified here **if presented together**.

## (II) HEAT PUMPS

A heat pump is a device which draws heat from a suitable heat source (principally underground or surface water, the soil or the air) and converts it with the assistance of a supplementary energy source (e.g., gas or electricity) into a source of more intense heat.

A heat-transfer fluid is generally used to transfer the heat from the source to the heat pump and from the heat pump to the medium to be treated.

There are two types of heat pumps : the **compression type** and the **absorption type**.

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Compression heat pumps consist essentially of the following elements :

- (1) an evaporator which extracts energy from the environment and transmits it to the heat-transfer fluid;
- (2) a compressor which, by mechanical means, draws off the vaporised fluid from the evaporator and transfers it at increased pressure to the condenser;
- (3) a condenser, which is a heat exchanger in which the vapour liquefies, giving up heat to the medium to be treated;

In absorption heat pumps, the compressor is replaced by a boiler containing water and a refrigerant and incorporating a burner.

Heat pumps are usually designated by the association of two factors, the first being the initial source of the heat and the second the medium whose temperature is to be modified. Among the principal types of apparatus are :

- (i) Air/water or air/air heat pumps, which draw ambient heat from the atmosphere and restore it in the form of warm water or warm air.
- (ii) Water/water or water/air heat pumps, which obtain heat from an underground source or from a mass of surface water.
- (iii) Earth/water or earth/air heat pumps : in these, heat is obtained by means of a system of tubes buried in the earth.

Heat pumps may be presented as a single item of apparatus, the various elements of the circuit forming a unit. Such a unit is referred to as a monobloc type. They may also be presented as several separate items. Certain heat pumps may be presented without an evaporator when they are intended for installation in plant already containing one. They are, in such cases, to be considered as incomplete articles having the essential character of the complete articles and remain classified here.

Heat pumps are used essentially to heat buildings or provide domestic hot water. Non-reversible heat pumps are generally used for these purposes.

However, the heading **excludes** reversible heat pumps comprising a motor-driven fan and elements for changing both the temperature and the humidity. These are regarded as air conditioning machines of heading 84.15.

### PARTS

**Subject** to the general provisions regarding the classification of parts (see the General Explanatory Note to Section XVI), parts of the goods of this heading, whether for domestic or industrial uses, are also classified here, e.g., condensers, absorbers, evaporators, generators, cabinets, counters and other refrigerating furniture, of the kind referred to in paragraph (2) above, not yet fitted with a complete refrigerating unit or with an evaporator but clearly designed to receive such equipment.

Compressors fall to be classified as such in heading 84.14, even when specially designed for use in refrigerators. Non-specialised parts (e.g., tubes and tanks) are classified in their own appropriate headings.

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This heading also **excludes** :

- (a) Air conditioning machines incorporating a refrigerator unit or a refrigerator unit evaporator (heading 84.15).
- (b) Gas liquefaction apparatus (e.g., Linde apparatus) (heading 84.19).