84.14 - Air or vacuum pumps, air or other gas compressors and fans; ventilating or recycling hoods incorporating a fan, whether or not fitted with filters.

8414.10 - Vacuum pumps

8414.20 - Hand- or foot-operated air pumps

8414.30 - Compressors of a kind used in refrigerating equipment

8414.40 - Air compressors mounted on a wheeled chassis for towing

- Fans :

8414.51 - - Table, floor, wall, window, ceiling or roof fans, with a self-contained electric motor of an output not exceeding 125 W

8414.59 - - Other

8414.60 - Hoods having a maximum horizontal side not exceeding 120 cm

8414.80 - Other

8414.90 - Parts

This heading covers machines and appliances, hand-operated or power driven, for the compression of air or other gases, or for creating a vacuum, and also machines for circulating air or other gases.

(A) PUMPS AND COMPRESSORS

In general, air pumps, vacuum pumps and compressors function on the same principles as and are broadly of similar construction to the liquid pumps (piston, rotary, centrifugal or ejector pumps) described under the preceding heading.

In addition, however, there are certain special types, particularly for producing high vacua, such as diffusion pumps (the pump fluid being oil or mercury), molecular pumps and entrapment pumps (getter pumps, cryopumps). Diffusion pumps, however, are sometimes made of glass, in which case they are **excluded** (**Chapter 70**).

Air and vacuum pumps serve many purposes : for facilitating boiling, distilling or evaporating at reduced pressure; for evacuating electric lamps or tubes, vacuum flasks, etc. Air pumps serve for pumping air at pressure (e.g., for inflating pneumatic tyres).

Unlike liquid pumps, air or other gas compressors (other than low pressure or intermittent working compressors) are water-cooled or have fins or other means for air cooling (surface cooling) to dissipate the considerable heat of compression which is generated.

There are several types of compressors, for example, reciprocating piston, centrifugal, axial and rotary compressors. A special type of compressor is the exhaust-gas turbocharger used in internal-combustion piston engines to increase power output.

Compressors are widely used : for compressing gases into gas cylinders; in chemical processes; for refrigerators, etc. and for compressing air or other gases in reservoirs to be used to force feed machines or apparatus such as compressed air engines, pneumatic picks, winches, brakes, pneumatic conveyor tubes, submarine ballast tanks, etc.

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The heading also includes free-piston generators for gas turbines, consisting of two horizontally-opposed driving pistons sliding in a common cylinder which is extended and enlarged at each end to form compression cylinders in which slide two other pistons, connected to the driving pistons, forming a pneumatic recoil. The driving pistons are forced apart by the explosion of an ignited gas, thus displacing the compression pistons. The return stroke of the compression pistons compresses air admitted into the compression cylinders, and forces it through exhaust valves together with the exhaust gases. The high pressure of the hot gases enables them to be applied directly to the rotors of gas turbines, the generator thus replacing the usual combustion chamber and compressor of the gas turbine.

As in the case of the pumps of **heading 84.13**, the air pumps and compressors of this group may be built with integral motors or turbines, the latter being most often employed for high pressure compressors operating on the principle of the multi-stage gas turbine in reverse.

(B) **FANS**

These machines, which may or may not be fitted with integral motors, are designed either for delivering large volumes of air or other gases at relatively low pressure or merely for creating a movement of the surrounding air.

Those of the first kind may act as air extractors or as blowers (e.g., industrial blowers used in wind tunnels). They consist of a propeller or blade-type impeller revolving in a casing or conduit, and function on the principle of rotary or centrifugal compressors.

The second type are of more simple construction, and consist merely of a driven fan rotating in free air.

Fans are used, *inter alia*, for ventilating mines and premises of all kinds, silos, ships; for extracting by suction dust, steam, smoke, hot gases, etc.; for drying many materials (leather, paper, textiles, paint, etc.); in mechanical draught apparatus for furnaces.

This group also includes **room fans**, whether or not with a tilting or oscillating device. These include ceiling fans, table fans, wall bracket fans, ring mounted fans for building into walls, window panes, etc.

This heading **excludes** fans fitted with elements additional to their motors or housing (such as large dust separating cones, filters, cooling or heating elements and heat exchangers) if such elements give them the characteristics of more complexmachines of other headings, e.g., air heaters, not electrically heated (**heading 73.22**), air conditioning machines (**heading 84.15**), dust extractors (**heading 84.21**), air coolers for the industrial treatment of materials (**heading 84.19**) or for premises (**heading 84.79**), electric space heating apparatus with built-in fans (**heading 85.16**).

(C) VENTILATING OR RECYCLING HOODS INCORPORATING A FAN, WHETHER OR NOT FITTED WITH FILTERS

This group includes cooker hoods incorporating a fan, for use in the home or in restaurants, canteens, hospitals, etc., as well as laboratory hoods and industrial hoods incorporating a fan.

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Compressors, air pumps, fans, blowers, etc., specially constructed for use with other machines remain classified in this heading and not as parts of such other machines.

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 are also classified here (e.g., pump or compressor bodies, blades, rotors or impellers, vanes and pistons).

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This heading also **excludes** :

(a) Exhaust-gas turbines (**heading 84.11**).

(b) Emulsion pumps (**heading 84.13**).

(c) Pneumatic elevators and conveyors (**heading 84.28**).

(d) Machines for cleaning, sorting or grading seed, grain or dried leguminous vegetables (**heading 84.37**).