84.71 - Automatic data processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included (+).

8471.30 - Portable automatic data processing machines, weighing not more than 10 kg, consisting of at least a central processing unit, a keyboard and a display

- Other automatic data processing machines :

8471.41 - - Comprising in the same housing at least a central processing unit and an input and output unit, whether or not combined

8471.49 - - Other, presented in the form of systems

8471.50 - Processing units other than those of subheading 8471.41 or 8471.49, whether or not containing in the same housing one or two of the following types of unit : storage units, input units, output units

8471.60 - Input or output units, whether or not containing storage units in the same housing

8471.70 - Storage units

8471.80 - Other units of automatic data processing machines

8471.90 - Other

(I) AUTOMATIC DATA PROCESSING MACHINES AND UNITS THEREOF

Data processing is the handling of information of all kinds, in pre-established logical sequences and for a specific purpose or purposes.

Automatic data processing machines are machines which, by logically interrelated operations performed in accordance with pre-established instructions (program), furnish data which can be used as such or, in some cases, serve in turn as data for other data processing operations.

This heading covers data processing machines in which the logical sequences of the operations can be changed from one job to another, and in which the operation can be automatic**,** that is to say with no manual intervention for the duration of the task. These machines mostly use electronic signals but may also use other technologies. They may be self-contained, all the elements required for data processing being combined in the same housing, or they may be in the form of systems consisting of a variable number of separate units.

This heading also covers separately presented constituent units of automatic data processing systems described above.

However, the heading **excludes** machines, instruments or apparatus incorporating or working in conjunction with an automatic data processing machine and performing a specific function. Such machines, instruments or apparatus are classified in the headings appropriate to their respective functions or, failing that, in residual headings (See Part (E) of the General Explanatory Note to this Chapter).

84.71

(A) AUTOMATIC DATA PROCESSING MACHINES

The automatic data processing machines of this heading must be capable of fulfilling **simultaneously** the conditions laid down in Note 5 (A) to this Chapter. That is to say, they must be capable of:

(1) Storing the processing program or programs and at least the data immediately necessary for the execution of the program;

(2) Being freely programmed in accordance with the requirements of the user;

(3) Performing arithmetical computations specified by the user; and

(4) Executing, without human intervention, a processing program which requires them to modify their execution, by logical decision during the processing run.

Thus, machines which operate only on fixed programs, i.e., programs which cannot be modified by the user, are **excluded** even though the user may be able to choose between a number of such fixed programs.

These machines have storage capability and also stored programs which can be changed from job to job.

Automatic data processing machines process data in coded form. A code consists of a finite set of characters (binary code, standard six bit ISO code, etc.).

The data input is usually automatic, by the use of data media such as magnetic tapes, or by direct reading of original documents, etc. There may also be arrangements for manual input by means of keyboards or the input may be furnished directly by certain instruments (e.g., measuring instruments).

The input data are converted by the input units into signals which can be used by the machine, and stored in the storage units.

Part of the data and program or programs may be temporarily stored in auxiliary storage units such as those using magnetic discs, magnetic tapes, etc. But these automatic data processing machines must have a main storage capability which is directly accessible for the execution of a particular program and which has a capacity at least sufficient to store those parts of the processing and translating programs and the data immediately necessary for the current processing run.

Automatic data processing machines may comprise in the same housing, the central processing unit, an input unit (e.g., a keyboard or a scanner) and an output unit (e.g., a visual display unit), or may consist of a number of interconnected separate units. In the latter case, the units form a "system" when it comprises at least the central processing unit, an input unit and an output unit (see Subheading Note 1 to this Chapter). The interconnections may be made by wired or wireless means.

A complete automatic data processing system must comprise, at least :

(1) A **central processing unit** which generally incorporates the main storage, the arithmetical and logical elements and the control elements; in some cases, however, these elements may be in the form of separate units.

(2) An **input unit** which receives input data and converts them into signals which can be processed by the machine.

(3) An **output unit** which converts the signals provided by the machine into an intelligible form (printed text, graphs, displays, etc.) or into coded data for further use (processing, control, etc.).

Two of these units (input and output units, for example) may be combined in one single unit.

A complete automatic data processing system is classified in this heading, even though one or more units may be classified elsewhere when presented separately (see part (B) **Separately presented units**, below).

These systems may include remote input or output units in the form of data terminals.

Such systems may also include units, apart from the input or output units, designed to increase the capacity of the system for instance, by expanding one or more of the functions of the central unit (see Part (B) below). Such units are inserted between the input or output units (start and end of the system), although adapting and converting units (channel adaptors and signal converters) may occasionally be connected before the input unit or after the output unit.

Automatic data processing machines and systems are put to many uses, for example, in industry, in trade, in scientific research and in public or private administrations. (See Part (E) of the General Explanatory Note to Chapter 84 with respect to the classification of machines incorporating or working in conjunction with an automatic data processing machine and performing a specific function (Note 5 (E) to this Chapter)).

(B) **SEPARATELY PRESENTED UNITS**

Subject to the provisions of Notes 5 (D) and (E) to this Chapter, this heading also covers separately presented constituent units of automatic data processing systems. These may be in the form of units having a separate housing or in the form of units not having a separate housing and designed to be inserted into a machine (e.g., insertion onto the main board of a central processing unit). Constituent units are those defined in Part (A) above and in the following paragraphs, as being parts of a complete system.

An apparatus can only be classified in this heading as a unit of an automatic data processing system if it :

(a) Performs a data processing function;

(b) Meets the following criteria set out in Note 5 (C) to this Chapter :

(i) It is of a kind solely or principally used in an automatic data processing system;

(ii) It is connectable to the central processing unit either directly or through one or more other units; and

(iii) It is able to accept or deliver data in a form (codes or signals) which can be used by the system.

(c) Is not excluded by the provisions of Notes 5 (D) and (E) to this Chapter.

In accordance with the last paragraph of Note 5 (C) to this Chapter, keyboards, X-Y co-ordinate input devices and disc storage units which satisfy the conditions of items (b) (ii) and (iii) above, are in all cases to be classified as constituent units of data processing systems.

If the unit performs a specific function other than data processing, it is to be classified in the heading appropriate to that function or, failing that, in a residual heading (see Note 5 (E) to this Chapter). If an apparatus does not meet the criteria set out in Note 5 (C) to this Chapter, or is not performing a data processing function, it is to be classified according to its characteristics by application of General Interpretative Rule 1, if necessary in combination with General Interpretative Rule 3 (a).

Separately presented appliances such as measuring or checking instruments adapted by the addition of devices (signal converters, for example), which enable them to be connected directly to a data processing machine, are, in particular, **not** to be regarded as units of an automatic data processing system. Such appliances fall to be classified in their own appropriate heading.

Apart from central processing units and input and output units, examples of other units include :

(1) **Additional storage** external to the central processing unit (magnetic card transports, magnetic or optical disc storages, tape autoloaders and libraries, optical disc drive libraries (sometimes referred to as "optical disc jukeboxes"), etc.). This group also includes additional data storage devices known as "proprietary storage formats", whether for internal installation in an automatic data processing machine or for external use with such machines. The devices may be in the form of drives for discs or tapes.

(2) **Additions which enhance the processing power of the central processing unit** (e.g. floating point processing units).

(3) **Control and adaptor units** such as those to effect interconnection of the central processing unit to input or output units (e.g., USB hubs). However, control and adaptor units for communication in a wired or wireless network (such as a local or wide area network) are **excluded** (**heading 85.17**).

(4) **Signal converting units**. At input, these enable an external signal to be understood by the machine, while at output, they convert the output signals that result from the processing carried out by the machine into signals which can be used externally.

(5) **X-Y co-ordinate input devices**, which are units for inputting position data into automatic data processing machines. These devices include the mouse, the light pen, the joystick, the track ball and the touch-sensitive screen. Their common attribute is that their input consists of, or is interpreted as, data indicating position relative to some fixed point. Their common usage is to control the position of the cursor on the display unit, as a replacement for or a complement to the cursor keys on the keyboard.

This category also covers graphic tablets, which are X–Y co-ordinate input devices making it possible to capture and trace the co-ordinates of a curve or any other geometrical form. This apparatus is generally composed of a rectangular board with an active sensing surface, a pointer or pen used to create drawings, and a zoom linked to a cross-piece, making it possible to input data.

This category further covers digitizers, which have similar functions to graphic tablets. However, while graphic tablets are used for creating original art and drawings, as well as for application menu selection and on-screen object control, digitizers are generally used for the capture of existing drawings that exist only in hard-copy form. Digitizer pointing devices may assume any shape, but must be small enough to be hand-held and moved around the (active) sensing region of the digitizer. Cross-hair cursors are the most common shape.

(II) MAGNETIC OR OPTICAL READERS, MACHINES FOR TRANSCRIBING DATA ONTO DATA MEDIA IN CODED FORM AND MACHINES FOR PROCESSING SUCH DATA, NOT ELSEWHERE SPECIFIED OR INCLUDED

This group comprises a wide range of machines, many being electro-magnetic or electronic, which usually complement each other and are generally used in systems for compiling statistics or for accounting or other operations. The group includes magnetic or optical readers, machines for transcribing data onto data media in coded form and machines which process data and which decode the result.

The group includes machines only if they are not elsewhere specified or included. It thus **excludes**, for example :

(a) The automatic data processing machines and units thereof described in Part (I) above, other than bar code readers.

(b) Automatic typewriters and word-processing machines (**heading 84.69**).

(c) Calculating machines, accounting machines and cash registers of **heading 84.70**, from which they differ in that they have no manual input arrangements but receive data solely in coded form (magnetic tape, discs, CD-ROMs, etc.).

(A) MAGNETIC OR OPTICAL READERS

Magnetic or optical readers read characters, generally in a special form, and convert them into electric signals (impulses) which can be directly used by machines for transcribing or processing coded information.

(1) **Magnetic readers**. In this type of appliance, the characters, printed with a special magnetic ink, are magnetised and then converted into electric impulses by a magnetic reader head. They are subsequently identified either by comparison with data registered in the storage units of the machine or by means of a numeric code, usually binary.

(2) **Optical readers**. These do not require the use of special ink. The characters are read directly by a series of photoelectric cells and translated on the binary code principle. This group also includes bar code readers. These machines generally use photosensitive semiconductor devices, e.g., laser diodes, and are used as input units in conjunction with an automatic data processing machine, or with other machines, e.g., cash registers. They are designed for working in the hand, for placing on a table or for fixing to a machine.

The readers described above are classified in this heading only if presented separately. When combined with other machines (e.g., machines for transcribing data onto data media in coded form and machines for processing such data in coded form) they are classified with those machines **provided** they are presented with them.

(B) MACHINES FOR TRANSCRIBING DATA ONTO DATA MEDIA IN CODED FORM

This group includes :

(1) **Machines for transferring coded information from one medium to another**. These machines can be used either to transfer coded information from one type of data medium to a different type or to transfer it to another medium of the same type. The latter category includes **reproducing machines** which are used to reproduce all or part of the data on a master tape, magnetic or optical discs (e.g., DVD, CD-ROM) by making a new tape or disc.

(2) **Machines for introducing fixed programs into integrated circuits** (programmers). These machines are designed to transfer, in coded form, the data contained in the internal memory of the programmers onto integrated circuits. The programmers "burn" the information onto one or more integrated circuits following various techniques suitable for the type of programmable integrated circuit used.

Some programmers have an additional feature (emulator) which allows the user to picture or emulate the result of the programming before actually committing the program to the integrated circuit.

PARTS AND ACCESSORIES

Subject to the general provisions regarding the classification of parts (see the General Explanatory Note to Section XVI), parts and accessories of the machines of this heading are classified in **heading 84.73**.

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This heading also **excludes** :

(a) Power supply units (**heading 85.04**).

(b) Modulator-demodulator apparatus (modems), which modulate, in transmittable form over a telephone network, information obtained from an automatic data processing machine, and reconvert it into digital form (**heading 85.17**).

(c) Electronic integrated circuits (**heading 85.42**).

(d) Flight simulators (e.g., **heading 88.05**).

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Subheading Explanatory Notes.

Subheading 8471.30

This subheading covers portable automatic data processing machines weighing not more than 10 kg. These machines, which are equipped with a flat screen, may be capable of operating without an external source of electric power and often have a modem or other means for establishing a link with a network.

Subheading 8471.90

This subheading covers, *inter alia*, optical disc filing systems which usually include keyboards, displays, optical disc drive units, scanners and printers. These systems may include an automatic data processing machine as the controller or they may be configured such that they are accessible or controllable by an automatic data processing machine. These systems generally perform the following functions :

- recording the image by electronic scanning
- filing
- retrieval
- display
- printing on ordinary paper.