
**Information technology — Case for 120 mm
DVD-RAM disks**

*Technologies de l'information — Coffret pour disques DVD-RAM de
diamètre 120 mm*

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

This International Standard was prepared by JISC (as Standard JIS X 6244-1998) with document support and contribution from ECMA and was adopted, under a special "fast-track procedure" by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

Annexes A to C form a normative part of this International Standard. Annexes D and E are for information only.

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Information technology — Case for 120 mm DVD-RAM disks

Section 1 - General

1 Scope

This International Standard specifies the characteristics of a case for use with 120 mm DVD-RAM disks as specified in ISO/IEC 16824. This International Standard specifies three related, but different implementations of such cases, viz.

- Type 1** Provides a case for a one-sided (Type 1S) or a two-sided (Type 2S) DVD-RAM disk such that the disk can not be removed from the case. This case is reversible.
- Type 2** Provides a case for a one-sided DVD-RAM disk (Type 1S) such that the disk may be removed from the case. This case is not reversible.
- Type 3** Provides a case into which a one-sided DVD-RAM disk (Type 1S) may be inserted, then used as a cartridge. This case is not reversible.

This International Standard specifies

- the environments in which the cases are to be operated and stored;
- the dimensional and mechanical characteristics of the case, so as to provide mechanical interchangeability between data processing systems;

This International Standard provides for mechanical interchange between optical disk drives. Together with 120 mm DVD-RAM disks according to ISO/IEC 16824 and a standard for volume and file structure, it provides for full data interchange between data processing systems.

2 Conformance

A claim of conformance with this International Standard shall specify the Type implemented. A case shall be in conformance with this International Standard if it meets the mandatory requirements specified herein for its Type.

3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

IEC 950:1991, *Safety of information technology equipment*.

ISO/IEC 16824:1999, *Information technology — 120 mm DVD rewritable disk (DVD-RAM)*.

4 Definitions

For the purposes of this International Standard, the following definitions apply.

- 4.1 Cartridge:** A device consisting of a case containing a rewritable disk.
- 4.2 Case:** The housing for an optical disk, that protects the disk and facilitates disk interchange.

5 Conventions and notations

5.1 Representation of numbers

A measured value is rounded off to the least significant digit of the corresponding specified value. For instance, it implies that a specified value of 1,26 with a positive tolerance of + 0,01 and a negative tolerance of - 0,02 allows a range of measured values from 1,235 to 1,275.

5.2 Names

The names of entities, e.g. specific sides, etc. are given a capital initial.

6 General description of the case

6.1 General description of the Type 1 case (Figure 1)

The case is a rigid protective container of rectangular shape. Sides A and B of the case are identical as far as the features given here are concerned. References to Sides A and B of the case can be changed to B or A respectively. When the opening of the one is a head and spindle window for the spindle and the optical head of the drive, that of the other is an access window for the disk clamping apparatus. A shutter uncovers the windows upon insertion into the drive, and automatically covers them upon removal from the drive. The case has features that enable a drive to reject a mis-inserted cartridge, to inhibit writing, sensor holes, detents for autoloading and a vertical use, gripper slots for an autochanger, label areas and side identification marks.

Sides A and B of the case have the same configuration.

6.2 General description of the Type 2 case (Figure 2)

The Type 2 case has the same features as the Type 1 case, but with some differences. The shape of the case is different on Side A and on Side B. Side A does not need to have a location hole, an alignment hole, Reference Surfaces, a write-inhibit hole, sensor holes and sensing areas. The case has an opening closed by a cover. This cover can be opened. In open position, the disk can be taken out of the case. Sensor hole A1 is originally closed. When the disk has been removed from the case, then this hole remains permanently open, indicating that the original disk contained in the case has been removed at least once or has been replaced by another disk.

6.3 General description of the Type 3 case (Figure 2)

The Type 3 case is identical with Type 2 case except that the sensor hole A1 is always open.

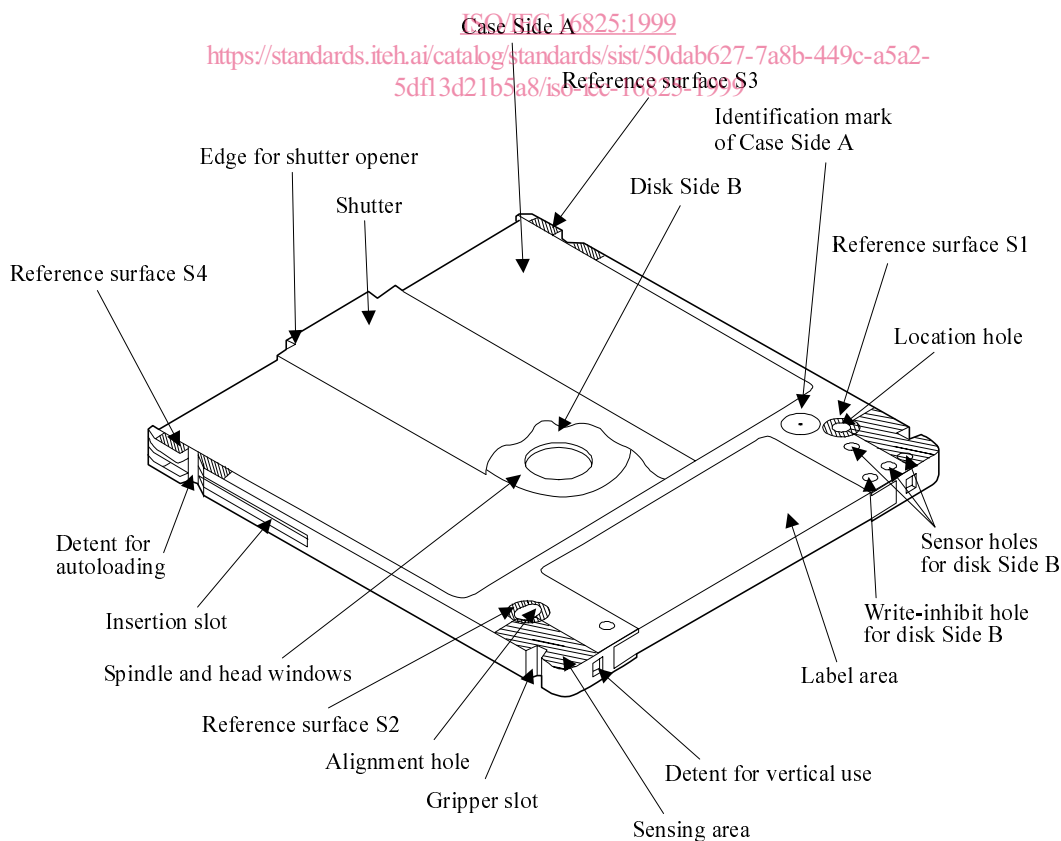


Figure 1 - General view of the Type 1 case, seen from Side A

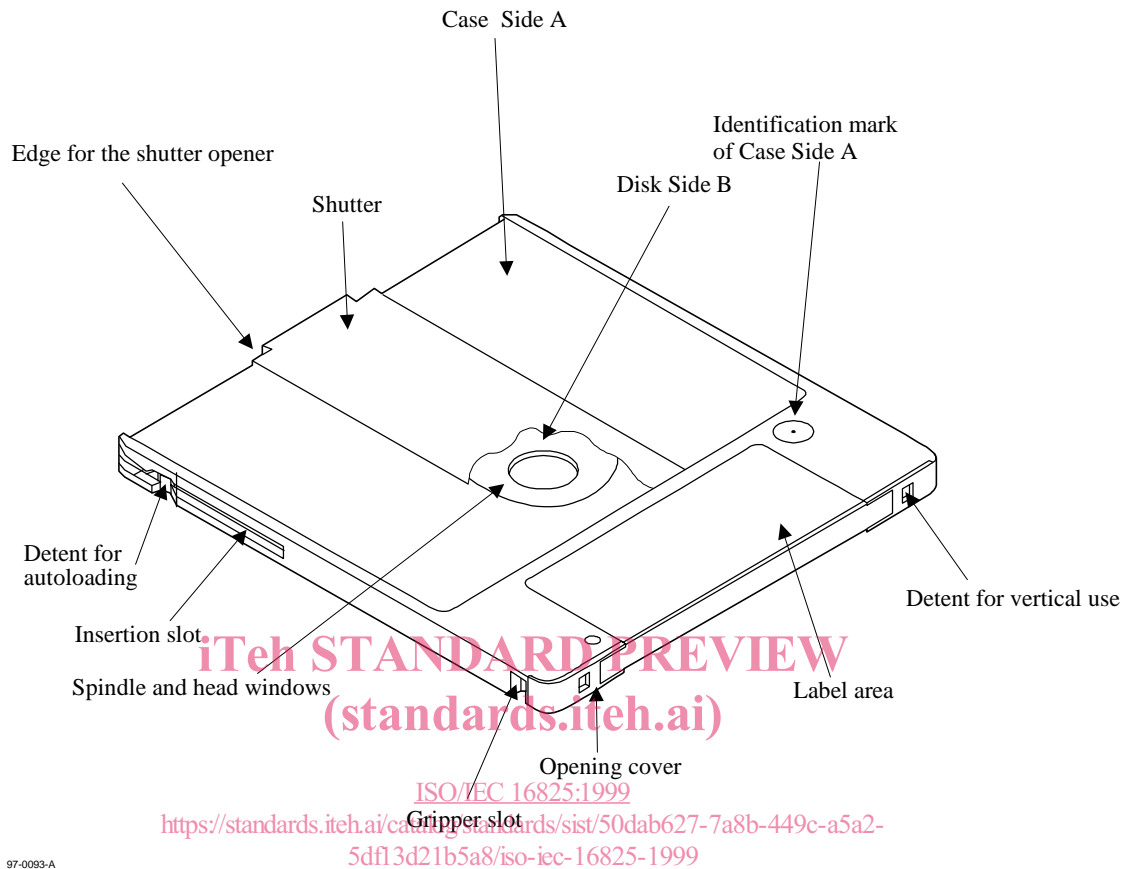


Figure 2 - General view of the Type 2 and Type 3 cases, seen from Side A

7 General requirements

7.1 Environments

7.1.1 Test environment

The test environment is the environment where the air immediately surrounding the case has the following properties:

Temperature	: 23 °C ± 2 °C
Relative humidity	: 50 % ± 5 %
Atmospheric pressure	: 86 kPa to 106 kPa

No condensation on or in the case or cartridge shall occur. Before testing, the case or cartridge shall be conditioned in this environment for 48 hours minimum.

Unless otherwise stated, all tests and measurements shall be made in this test environment.

7.1.2 Operating environment

This International Standard requires that a case which meets all requirements of this International Standard in the specified test environment provides mechanical interchange over the specified ranges of environmental parameters in the operating environment. When the case according to this International Standard contains a DVD-RAM disk according to International Standard ISO/IEC 16824, they constitute together a cartridge. This cartridge shall meet the requirements of this clause and provides for data interchange.

The operating environment is the environment where the air immediately surrounding the case or cartridge has the following properties:

Temperature	: 5 °C to 60 °C
Relative humidity	: 3 % to 85 %
Absolute humidity	: 1 g/m ³ to 30 g/m ³
Temperature gradient	: 10 °C /h max.
Relative humidity gradient	: 10 %/h max.

No condensation on or in the case or cartridge shall occur. If the case or cartridge has been exposed to conditions outside those specified in this clause, it shall be acclimatized in the operating environment for at least 2 h before use.

7.1.3 Storage environment

The storage environment is defined as an environment where the air immediately surrounding the case or cartridge has the following properties.

Temperature	: -10 °C to 50 °C
Relative humidity	: 3 % to 85 %
Absolute humidity	: 1 g/m ³ to 30 g/m ³
Atmospheric pressure	: 75 kPa to 106 kPa
Temperature gradient	: 10 °C /h max.
Relative humidity gradient	: 10 %/h max.

No condensation on or in the case or cartridge shall occur.

7.1.4 Transportation

This International Standard does not specify requirements for transportation; guidance is given in annex E.

7.2 Temperature shock

The case shall be withstand a temperature shock of up to 20°C when inserted into, or removed from, the drive.

7.3 Safety requirement

The case shall satisfy the safety requirements of Standard IEC 950, when used in the intended manner or in any foreseeable use in an information processing system.

7.4 Flammability

The case shall be made from materials that comply with the flammability class for HB materials, or better, as specified in IEC 950.

Section 2 - Dimensional and Mechanical characteristics of the case

8 Dimensional characteristics

The dimensions of the case shall be referred to three orthogonal Reference Planes X, Y and Z. The case shall be constrained such that four reference surfaces S1 to S4 on Side B of the case lie in Reference Plane Z. The intersection of the three planes defines the centre of the location hole. The centre of the alignment hole shall lie on the intersection of Reference Planes X and Z. Refer to annex A. A dimension of a feature referenced to one of the planes is the shortest distance from the feature to the plane.

Side A of the Type 1 case is referred to the three orthogonal Reference Planes X, Y' and Z', where

- Y' is a plane parallel to Reference Plane Y at a nominal distance of 102,0 mm,
- Z' is a plane parallel to Reference Plane Z at a nominal distance of 8,0 mm.

8.1 Dimensions of the Type 1 case

The dimensions of the Type 1 case shall be measured in the test environment. The dimensions of the case in an operating environment can be estimated from the dimensions specified in this clause.

8.1.1 Overall dimensions (Figure 3)

The total length of the case shall be

$$L_{101} = 135,5 \text{ mm} \pm 0,4 \text{ mm.}$$

The distance from the top of the case to Reference Plane X shall be

$$L_{102} = 112,5 \text{ mm} \begin{array}{l} + 0,3 \text{ mm} \\ - 0,2 \text{ mm} \end{array}$$

with the width

$$L_{103} = 3,6 \text{ mm min.}$$

from the left-hand and right-hand edges of the case.

The distance from the bottom of the case to Reference Plane X shall be

$$L_{104} = 23,0 \text{ mm} \pm 0,2 \text{ mm.}$$

The total width of the case shall be

$$L_{105} = 124,6 \text{ mm} \begin{array}{l} + 0,0 \text{ mm} \\ - 0,5 \text{ mm.} \end{array}$$

The distance from the left-hand side of the case to Reference Plane Y shall be

$$L_{106} = 113,3 \text{ mm} \begin{array}{l} + 0,2 \text{ mm} \\ - 0,4 \text{ mm.} \end{array}$$

The distance from the right-hand side of the case to Reference Plane Y shall be

$$L_{107} = 11,3 \text{ mm} \begin{array}{l} + 0,1 \text{ mm} \\ - 0,3 \text{ mm.} \end{array}$$

The two corners of the top shall be rounded with a radius

$$R_{101} = 4,0 \text{ mm} \pm 0,2 \text{ mm}$$

centred at

$$L_{108} = 4,0 \text{ mm} \pm 0,1 \text{ mm}$$

from the edge of the case and

$$L_{109} = 3,5 \text{ mm} \pm 0,1 \text{ mm}$$

from the top of the case.

The two corners of the bottom shall be rounded with a radius

$$R_{102} = 4,0 \text{ mm} \pm 0,2 \text{ mm.}$$

In the zones delimited by

$$L_{110} = 6,0 \text{ mm}$$

from the left-hand and right-hand edges of the case, there shall be the continuous guide areas running from the top to Reference Plane X of the case, with a width

$$L_{111} = 0,8 \text{ mm min.}$$

the thickness of the case shall be

$$L_{112} = 8,0 \text{ mm} \begin{array}{l} + 0,2 \text{ mm} \\ - 0,1 \text{ mm.} \end{array}$$

The eight long edges of the case shall be rounded with a radius

$$R_{103} = 0,5 \text{ mm} \pm 0,1 \text{ mm.}$$

8.1.2 Location hole (Figure 3)

The centre of the location hole shall coincide with the intersection of Reference Planes X, Y and Z.

The diameter of the hole shall be

$$D_{101} = 4,00 \text{ mm} \begin{array}{l} + 0,05 \text{ mm} \\ - 0,00 \text{ mm} \end{array}$$

its depth shall be

$$L_{113} = 1,2 \text{ mm min.}$$

The room below the location hole shall be free up to

$$L_{114} = 5,0 \text{ mm min.}$$

below Reference Plane Z

The diameter of the free room shall be at least equal to D_{101} .

The lead-in edges shall be rounded with a radius

$$R_{104} = 0,5 \text{ mm} \pm 0,1 \text{ mm.}$$

8.1.3 Alignment hole (Figure 3)

The centre of the alignment hole shall lie on the intersection of the Reference Planes X and Z at a distance

$$L_{115} = 102,0 \text{ mm} \pm 0,2 \text{ mm}$$

from Reference Plane Y.

The alignment hole shall have a substantially rectangular shape. Its dimensions shall be

$$L_{116} = 4,00 \text{ mm} \begin{array}{l} + 0,05 \text{ mm} \\ - 0,00 \text{ mm} \end{array}$$

$$L_{117} = 5,6 \text{ mm} \begin{array}{l} + 0,2 \text{ mm} \\ - 0,0 \text{ mm} \end{array}$$

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its depth shall be equal to L_{113} . The room below the alignment hole shall be free up to at least L_{114} . The dimensions of the free room shall be at least L_{116} and L_{117} .

The lead-in edges shall be rounded with a radius R_{104} .

8.1.4 Reference surfaces (Figure 4)

There shall be four reference surfaces S1, S2, S3 and S4 on Side B of the case.

Surfaces S1 and S2 shall be circular with a diameter

$$D_{102} = 7,0 \text{ mm min.}$$

S1 shall be centred on the location hole, and S2 shall be centred on the alignment hole.

Surfaces S3 and S4 shall be rectangular with dimensions

$$L_{118} = 8,2 \text{ mm max.}$$

$$L_{119} = 110,2 \text{ mm max.}$$

from Reference Plane Y and

$$L_{120} = 87,0 \text{ mm max.}$$

$$L_{121} = 108,0 \text{ mm min.}$$

from Reference Plane X, except in the areas of the detents for autoloading.

8.1.5 Insertion slots (Figure 5)

The case shall have two symmetrical insertion slots.

The bottom of the slots shall be at a distance

$$L_{123} = 60,0 \text{ mm} \pm 0,2 \text{ mm}$$

from Reference Plane X.

The depth measured from the edge of the case shall be

$$L_{124} = 2,0 \text{ mm} \begin{array}{l} + 0,2 \text{ mm} \\ - 0,0 \text{ mm.} \end{array}$$

The side of the insertion slots parallel to Reference Plane Z shall be at a distance

$$L_{125} = 2,5 \text{ mm} \pm 0,1 \text{ mm}$$

from Reference Plane Z. The width of the insertion slots shall be

$$L_{126} = 3,0 \text{ mm} \begin{array}{l} + 0,2 \text{ mm} \\ - 0,0 \text{ mm.} \end{array}$$

The slots shall have a lead-in slope defined by

$$L_{127} = 7,0 \text{ mm} \pm 0,2 \text{ mm}$$

from the top of the case and an angle

$$\alpha_{101} = 7,5^\circ \pm 1,0^\circ.$$

8.1.6 Detents (Figure 5)

The case shall have two symmetrical detents intended for auto-loading. The detents shall be through Side A and Side B.

The position and dimensions of the detents are specified by

$$R_{105} = 0,5 \text{ mm max.}$$

$$L_{128} = 100,5 \text{ mm} \pm 0,3 \text{ mm}$$

$$L_{129} = 93,0 \text{ mm} \pm 0,3 \text{ mm}$$

$$L_{130} = 3,3 \text{ mm} \pm 0,1 \text{ mm}$$

$$L_{131} = 2,5 \text{ mm} \pm 0,1 \text{ mm.}$$

The outside edges of the detents shall be rounded off with a radius

$$R_{106} = 0,5 \text{ mm} \pm 0,1 \text{ mm.}$$

The bottom of the case shall have two symmetrical detents intended for clamping a cartridge in case of vertical use. Their dimensions shall be

$$L_{132} = 3,0 \text{ mm} \pm 0,1 \text{ mm}$$

$$L_{133} = 3,0 \text{ mm} \pm 0,1 \text{ mm}$$

$$L_{134} = 1,0 \text{ mm} \pm 0,1 \text{ mm}$$

The centre of one of these detents lies on Reference Plane Y, the centre of the other is at a distance

$$L_{135} = 102,0 \text{ mm} \pm 0,3 \text{ mm}$$

from Reference Plane Y. Both centres are at a distance

$$L_{136} = 4,0 \text{ mm} \pm 0,1 \text{ mm}$$

from Reference Plane Z.

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8.1.7 Gripper slots (Figure 5)

The case shall have two symmetrical gripper slots. The slots shall be through Sides A and B.

Each slot shall have a depth of

$$L_{137} = 3,0 \text{ mm} \begin{array}{l} + 0,3 \text{ mm} \\ - 0,0 \text{ mm} \end{array}$$

from the edge of the case and a width of

$$L_{138} = 4,0 \text{ mm} \begin{array}{l} + 0,3 \text{ mm} \\ - 0,0 \text{ mm} \end{array}$$

The upper edge of the slot shall be at

$$L_{139} = 11,0 \text{ mm} \begin{array}{l} + 0,0 \text{ mm} \\ - 0,3 \text{ mm} \end{array}$$

from Reference Plane X.

The corners of the slot shall be rounded off by a radius

$$R_{107} = 0,5 \text{ mm} \pm 0,2 \text{ mm}.$$

8.1.8 Write-inhibit hole (Figure 6)

The case with a two-sided disk shall have a write-inhibit hole on both Sides A and B. The case with a one-sided disk shall have a write-inhibit hole on Side B only. The write-inhibit hole shall have a device for opening and closing the hole. The hole at the right-hand side of Side B of the case, is the write-inhibit hole for Side A of the disk. The protected side of the disk shall be identified either by an indication on the case or by the fact that the device for Side A of the disk can only be operated from Side A of the case.

When writing and erasing on Side A of the disk are not allowed, the write-inhibit hole shall be open. It shall have a diameter

$$D_{103} = 3,0 \text{ mm min.}$$

The position of its centre shall be specified by

$$L_{140} = 18,5 \text{ mm} \pm 0,2 \text{ mm}$$

$$L_{141} = 9,0 \text{ mm} \pm 0,2 \text{ mm}$$

on Side B of the case.

The hole shall extend below Reference Plane Z by

$$L_{142} = 5,0 \text{ mm min.}$$

with a diameter equal at least to D_{103} .

When writing and erasing of the disk are allowed, the write-inhibit hole shall be closed by the write protect device.

The write protect device shall not be recessed from Reference Plane Z by more than 0,3 mm.

8.1.9 Sensor holes (Figure 6)

The case shall have three sensor holes on Side B. The set of holes on Side B of the case, A1, A2 and A3 pertains to Side A of the disk. The holes shall have a diameter of

$$D_{104} = 3,0 \text{ mm min.}$$

and the positions of their centres shall be specified by L_{140} and

$$L_{144} = 7,5 \text{ mm} \pm 0,2 \text{ mm}$$

$$L_{145} = 3,5 \text{ mm} \pm 0,2 \text{ mm}$$

$$L_{146} = 2,0 \text{ mm} \pm 0,2 \text{ mm}.$$

The room below the holes shall be free up to

$$L_{147} = 5,0 \text{ mm min.}$$

Reference Plane Z

The diameter of the free room shall be at least equal to D_{104} . The holes are permitted to extend through Side A.

When a hole for Side A of the disk is closed, the closure shall not be recessed from Reference Plane Z by more than 0,3 mm.

Side A of the case shall have corresponding sensor holes B1, B2 and B3 with the diameter D_{104} .

The functions of the sensor holes are specified in table 1.

Table 1 - Use of the sensor holes

Sensor hole	Function		Condition	
	Closed	Open	Case for a two-sided disk	Case for a one-sided disk
A1	The original disk has not been taken out	The original disk has been taken out or a disk has been put in	Closed	Closed
A2	Active side	Non active side	Closed	Closed
A3	Reserved		Closed	Closed
B1	The original disk has not been taken out	The original disk has been taken out or a disk has been put in	Closed	Closed
B2	Active side	Non active side	Closed	Open
B3	Reserved		Closed	Closed

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8.1.10 Sensing areas (Figure 6)

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The case shall have two sensing areas on Side B used by drives for the detection of a cartridge. The first area shall be limited by Reference Planes X and Y, the bottom and the right-side of the case. The second area shall be limited by Reference Plane X, a plane parallel to Reference Plane Y at a distance equal to L_{115} , the bottom and the left-hand side of the case. These areas may be recessed from Reference Plane Z by 0,3 mm max., except for the reference surfaces S1 and S2, the gripper slots and the sensor holes.

8.1.11 Spindle and head windows (Figure 7)

The dimensions of the window are referenced to a centreline, located at a distance

$$L_{150} = 51,0 \text{ mm} \pm 0,1 \text{ mm}$$

from Reference Plane Y. The width of the window from the top of the case to

$$L_{151} = 50,0 \text{ mm max.}$$

shall be

$$L_{152} = 19,5 \text{ mm} \begin{matrix} + 0,2 \text{ mm} \\ - 0,0 \text{ mm} \end{matrix}$$

and

$$L_{153} = 19,5 \text{ mm} \begin{matrix} + 0,2 \text{ mm} \\ - 0,0 \text{ mm.} \end{matrix}$$

The top of the window shall be specified by

$$R_{108} = 60,7 \text{ mm min.}$$