

Helical-scan digital component video cassette recording system using 19 mm magnetic tape (format D-1)

The European Standard EN 61016:2001 has the status of a
British Standard

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National foreword

This British Standard is the official English language version of EN 61016:2001. It is identical with IEC 61016:1989 (incorporating Amendment 1:1999).

The UK participation in its preparation was entrusted to Technical Committee EPL/100, Audio, video and multimedia systems and equipment, which has the responsibility to:

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**Helical-scan digital component video cassette recording system
using 19 mm magnetic tape (format D-1)
(IEC 61016:1989 + A1:1999)**

Système de magnétoscope numérique
à composantes à cassette à balayage
hélicoïdal utilisant la bande magnétique
de 19 mm (format D-1)
(CEI 61016:1989 + A1:1999)

Videokassettensystem mit
Schrägschraufzeichnung digitaler
Komponenten auf Magnetband 19 mm
(D-1-Format)
(IEC 61016:1989 + A1:1999)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 61016:1989 and its amendment 1:1999, prepared by the former SC 60B and SC 100B, Recording, of IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 61016 on 2000-08-01 without any modification.

The following dates were fixed:

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- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2003-08-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61016:1989 and its amendment 1:1999 was approved by CENELEC as a European Standard without any modification.

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HELICAL-SCAN DIGITAL COMPONENT VIDEO CASSETTE RECORDING SYSTEM USING 19 mm MAGNETIC TAPE (FORMAT D-1)

SECTION ONE – GENERAL

1. Scope

This standard is applicable to magnetic recording of one digital video and four digital audio signals using 19 mm tape cassettes. It is valid for TV signals in digital component form, generated according to the rules of the CCIR Recommendations 601 and 656 and for digital audio signals according to IEC Publication 958.

This standard also describes the digital recording of ancillary data and the analog recording of one cue track and the control track.

2. Object

The object of this standard is to define the electrical and mechanical characteristics of equipment which will provide for the interchangeability of recorded cassettes.

The requirements given relate to 525/60 and 625/50 TV systems.

3. Environment and test conditions

Tests and measurements made on the system to check the requirements of this standard shall be carried out under the following conditions:

temperature: 20 ± 1 °C
relative humidity: $50 \pm 2\%$
barometric pressure: 86 kPa to 106 kPa
tape tension: 0.8 ± 0.05 N
tape conditioning: not less than 24 h

SECTION TWO – VIDEOTAPE CASSETTE

4. Mechanical parameters

4.1 *Cassette dimensions*

The dimensions of the three different cassettes used for recording shall be in accordance with Figures 1 to 15.

4.1.1 *Mechanical tolerances*

General tolerances for dimensions, except those for which tolerances are otherwise specified, shall be as follows:

Table 1 – Mechanical tolerances

Over	to	mm
0	4	± 0.2
4	16	± 0.3
16	63	± 0.4
63	250	± 0.5
250		± 0.7

4.2 Identification of cassettes

The three sizes of cassettes shall be identified as:

Small: D-1S
Medium: D-1M
Large: D-1L

4.3 Tape lengths, thickness and play times

Table 2 – Tape lengths of S, M, L cassettes

Tape Cassette	16 μ m		13 μ m	
S	190 m	11 min	225 m	13 min
M	587 m	34 min	708 m	41 min
L	1 311 m	76 min	1 622 m	94 min

4.4 Face of magnetic coating

The magnetic coating on the tape shall face out of the cassette as specified in Figures 1 to 3.

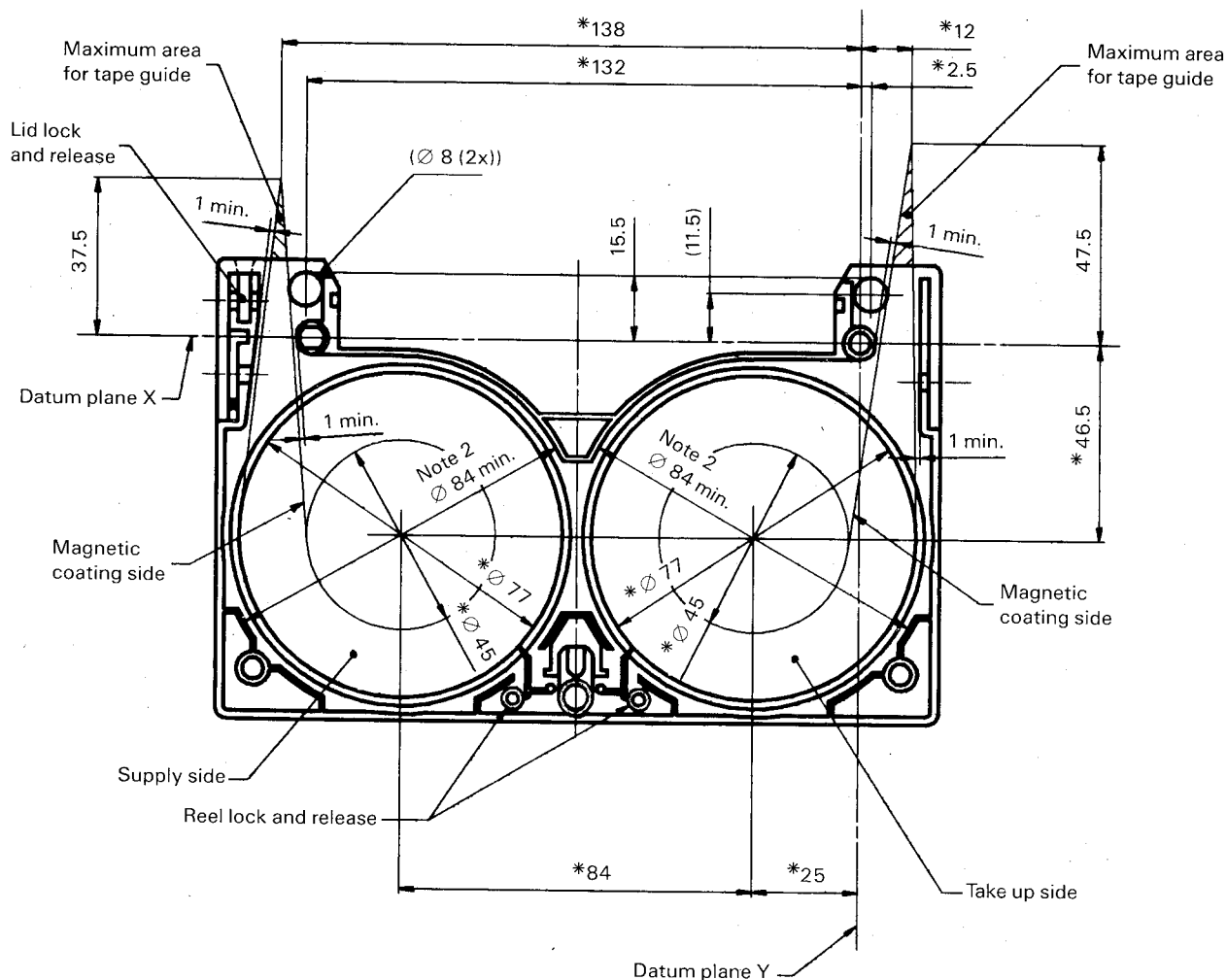
4.5 Datum planes

4.5.1 Datum plane Z is determined by datum areas A, B and C as specified in Figures 4 to 6.

4.5.2 Datum C does not need to correspond to a fastener.

4.5.3 Datum plane X shall be orthogonal to datum plane Z and shall run through the centre of datum hole (a) and datum hole (b) as specified in Figures 7 to 9.

4.5.4 Datum plane Y shall be orthogonal to both datum plane X and datum plane Z and shall run through the centre of datum hole (a) as specified in Figures 7 to 9.

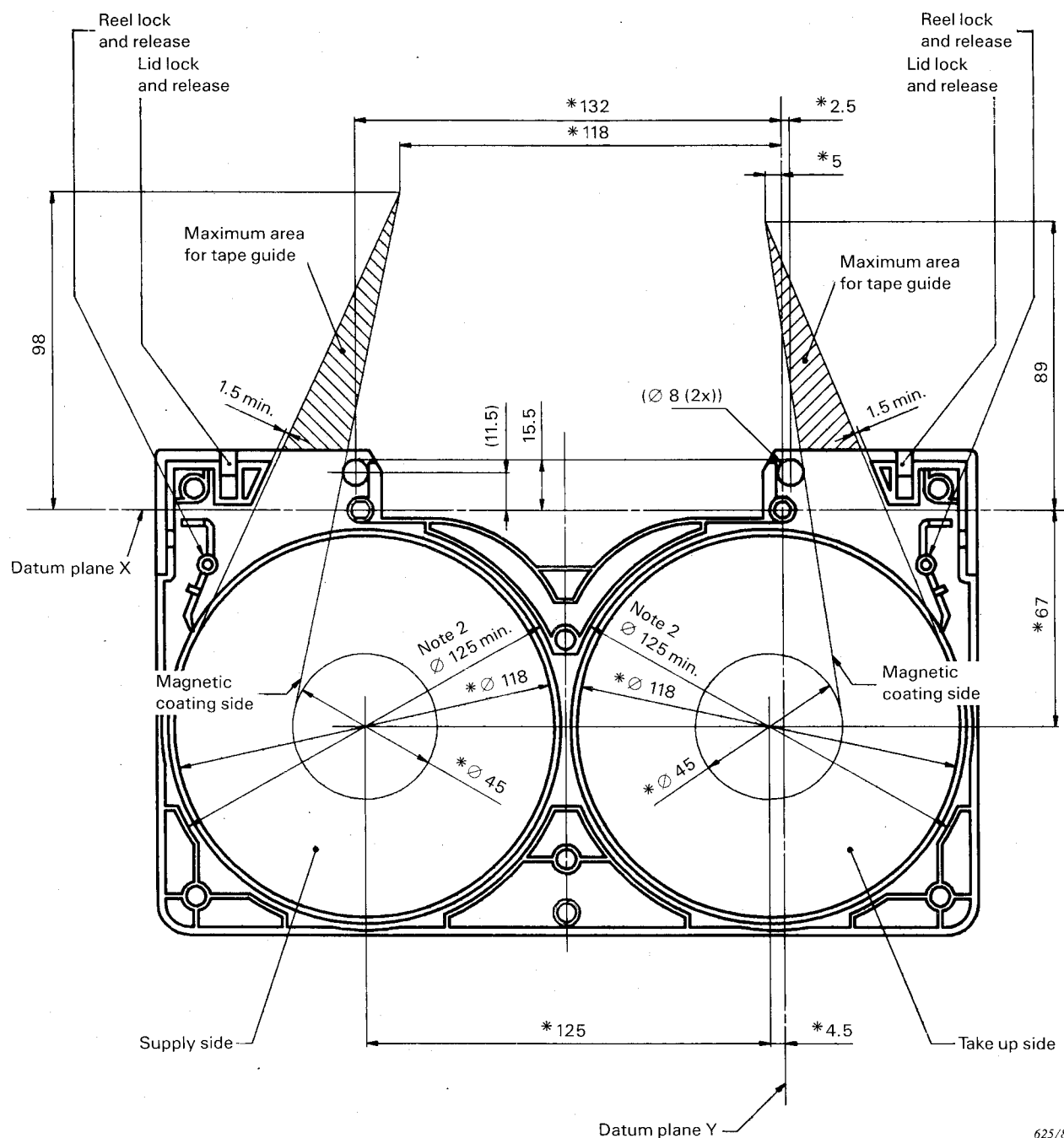


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Dimensions in millimetres

FIGURE 1 – Top view, inner structure and tape path of the D-1S cassette
(for reference only)

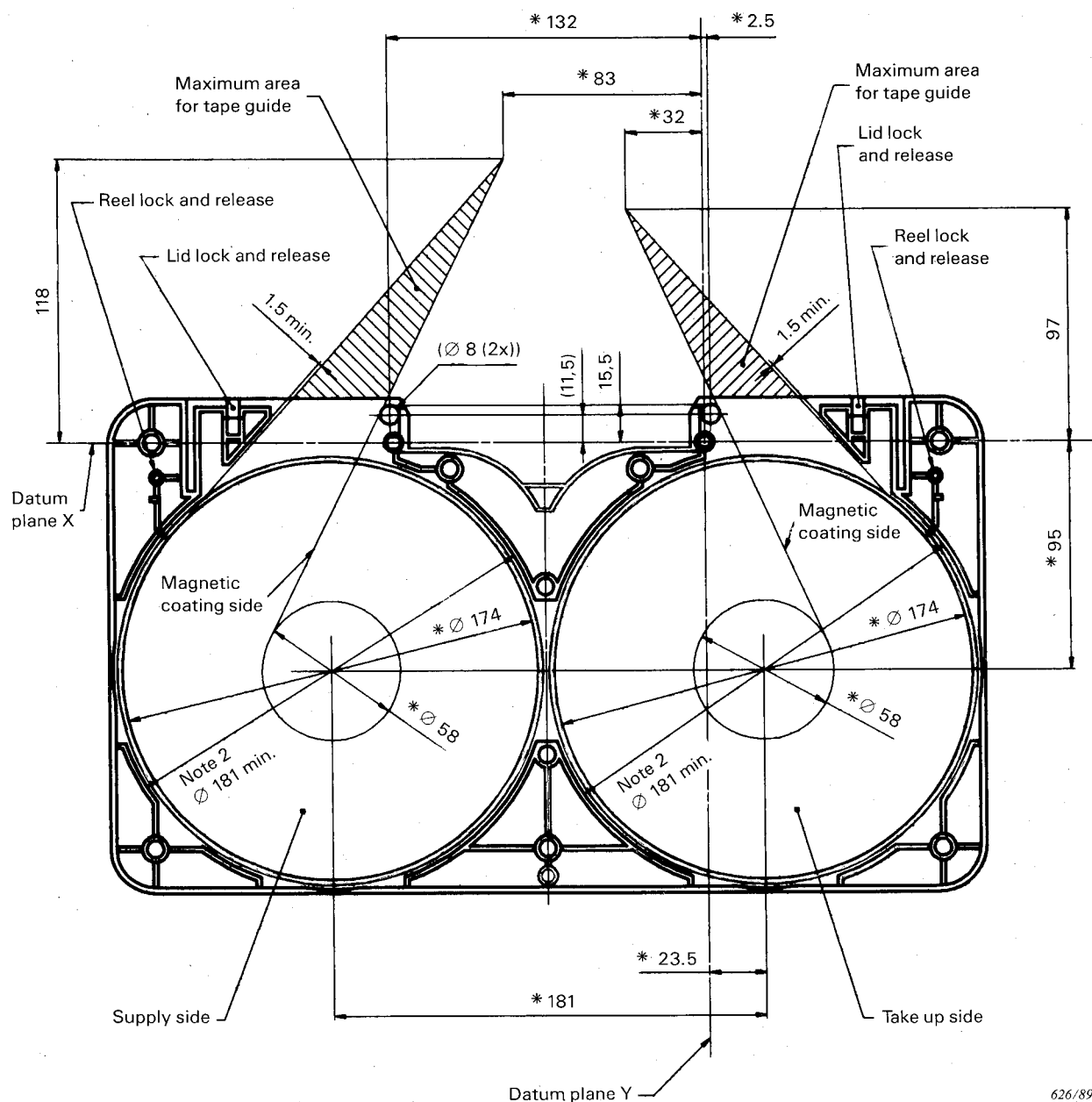
Notes 1. – Dimensions with an asterisk are nominal values specifying the tape path.
2. – Area for the reel.



Dimensions in millimetres

FIGURE 2 – Top view, inner structure and tape path of the D-1M cassette

Notes 1. – Dimensions with an asterisk are nominal values specifying the tape path.
2. – Area for the reel.



Dimensions in millimetres

FIGURE 3 – Top view, inner structure and tape path of the D-1L cassette

Notes 1. – Dimensions with an asterisk are nominal values specifying the tape path.
 2. – Area for the reel.

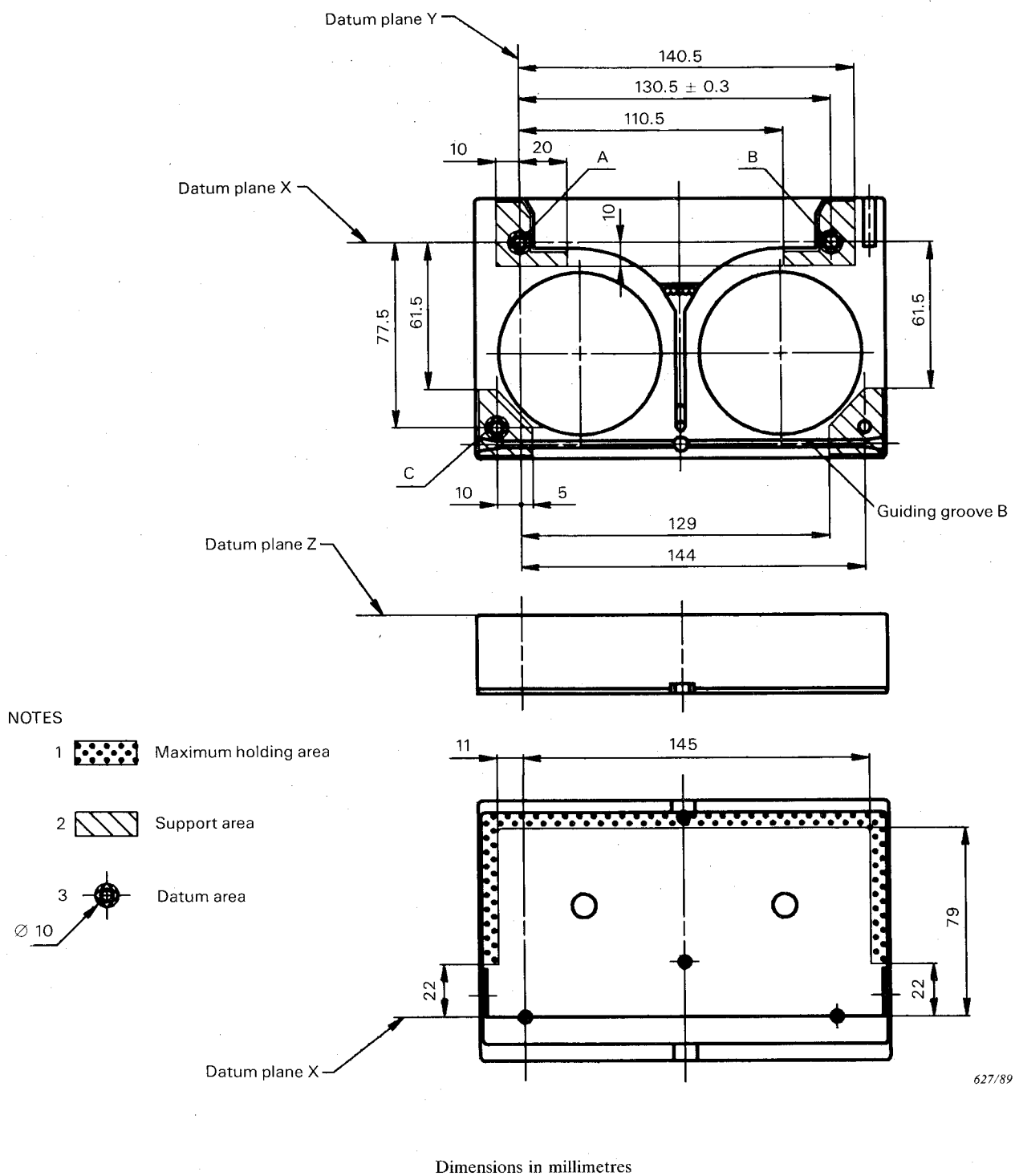


FIGURE 4 – Datum area, support area and holding area of the D-1S cassette

- Notes 1. – The cassette shall be secured by the recorder and/or player unit on the dotted area.
2. – The periphery within 1.0 mm from the edge of guiding groove B and from the edge of the cassette shall be removed from the support area. The cassette shall be supported by the recorder and/or player unit on the hatched area.
3. – Datum plane Z shall be determined by datum areas A, B, and C.

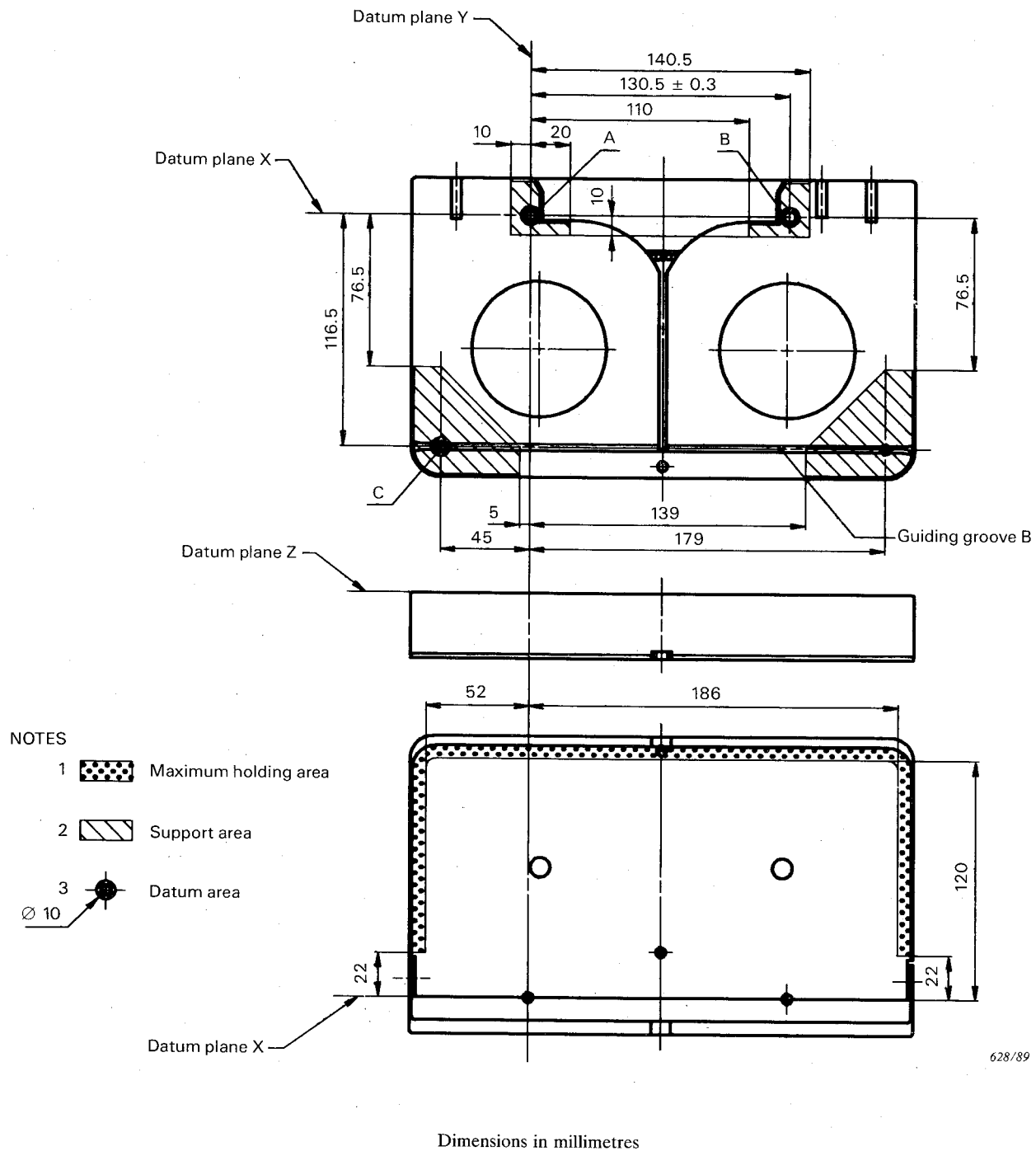
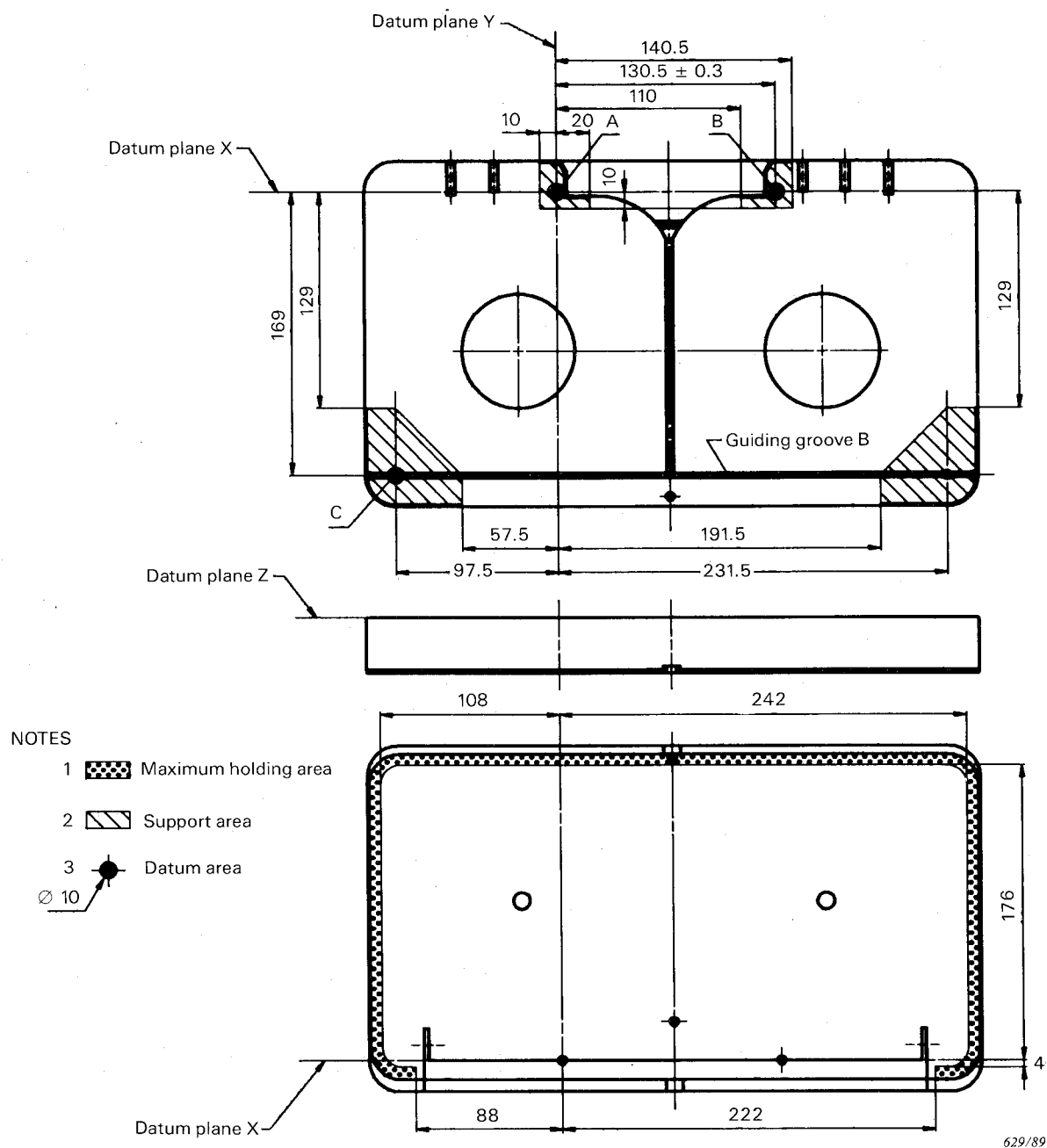


FIGURE 5 – Datum area, support area and holding area of the D-1M cassette

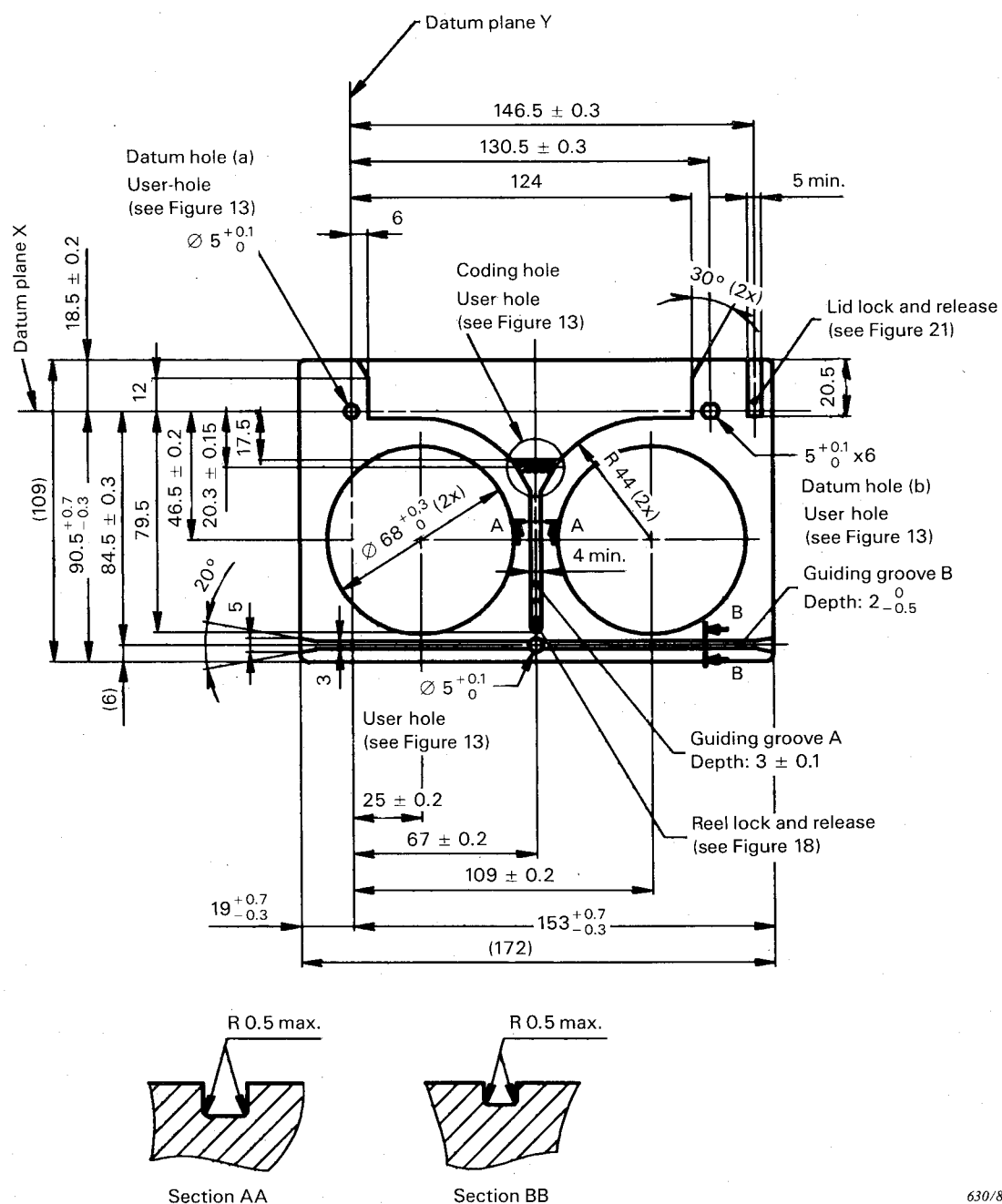
- Notes 1. – The cassette shall be secured by the recorder and/or player unit on the dotted area.
2. – The periphery within 1.0 mm from the edge of guiding groove B and from the edge of the cassette shall be removed from the support area. The cassette shall be supported by the recorder and/or player unit on the hatched area.
3. – Datum plane Z shall be determined by datum areas A, B, and C.



Dimensions in millimetres

FIGURE 6 – Datum area, support area and holding area of the D-1L cassette

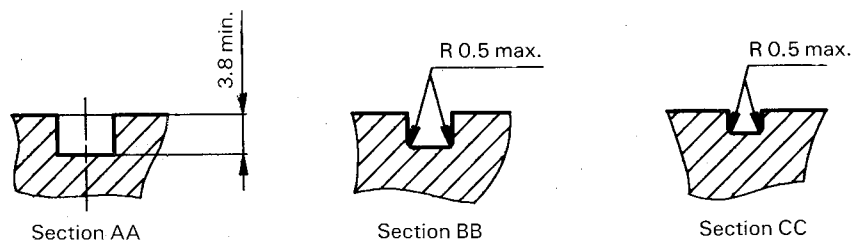
- Notes 1. – The cassette shall be secured by the recorder and/or player unit on the dotted area.
2. – The periphery within 1.0 mm from the edge of guiding groove B and from the edge of the cassette shall be removed from the support area. The cassette shall be supported by the recorder and/or player unit on the hatched area.
3. – Datum plane Z shall be determined by datum areas A, B, and C.



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Dimensions in millimetres

FIGURE 7 – Bottom view of D-1S cassette



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FIGURE 8 – Bottom view of D-1M cassette



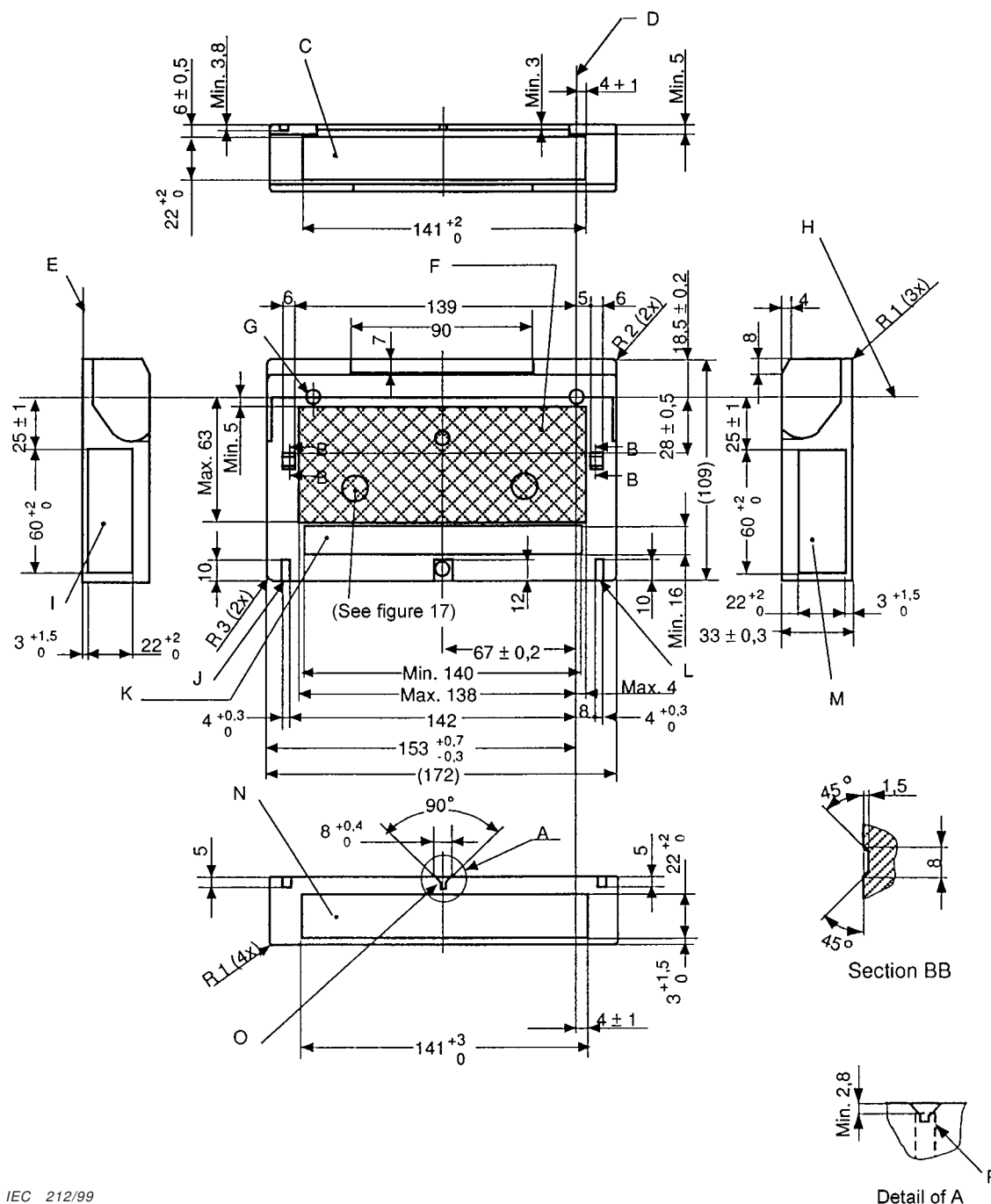
Dimensions in millimetres

FIGURE 9 – Bottom view of D-1L cassette

4.6 Window and labels

4.6.1 Window and label areas shall be as specified in Figures 10 to 12, pages 33 to 37.

- 4.6.2 Labels attached to the cassette shall not extend beyond the external dimensions as shown in Figures 10 to 12.
- 4.6.3 Labels shall not interfere with users' or manufacturers' identification holes.
- 4.6.4 Labels shall not interfere with the hub drive and support mechanism.



IEC 212/99

Key:

- | | | | |
|---|-------------------------------------|---|--------------------------------------|
| C | Depth: 0,2 to 0,3 (see note 4) | J | Picker notch |
| D | Datum plane Y | K | Depth: 0,2 to 0,3 (see note 5) |
| E | Datum plane Z | L | Picker notch |
| F | Window area/label area (see note 1) | M | Depth: 0,2 to 0,3 (see note 2) |
| G | 4 user plugs (see figure 13) | N | Depth: 0,2 to 0,3 (see note 3) |
| H | Datum plane X | O | Detent and misinsertion notch |
| I | Depth: 0,2 to 0,3 (see note 2) | P | Configuration-optional user plug (2) |

Dimensions in millimetres

NOTE 1 – The cross-hatched area is available for the window/labels.

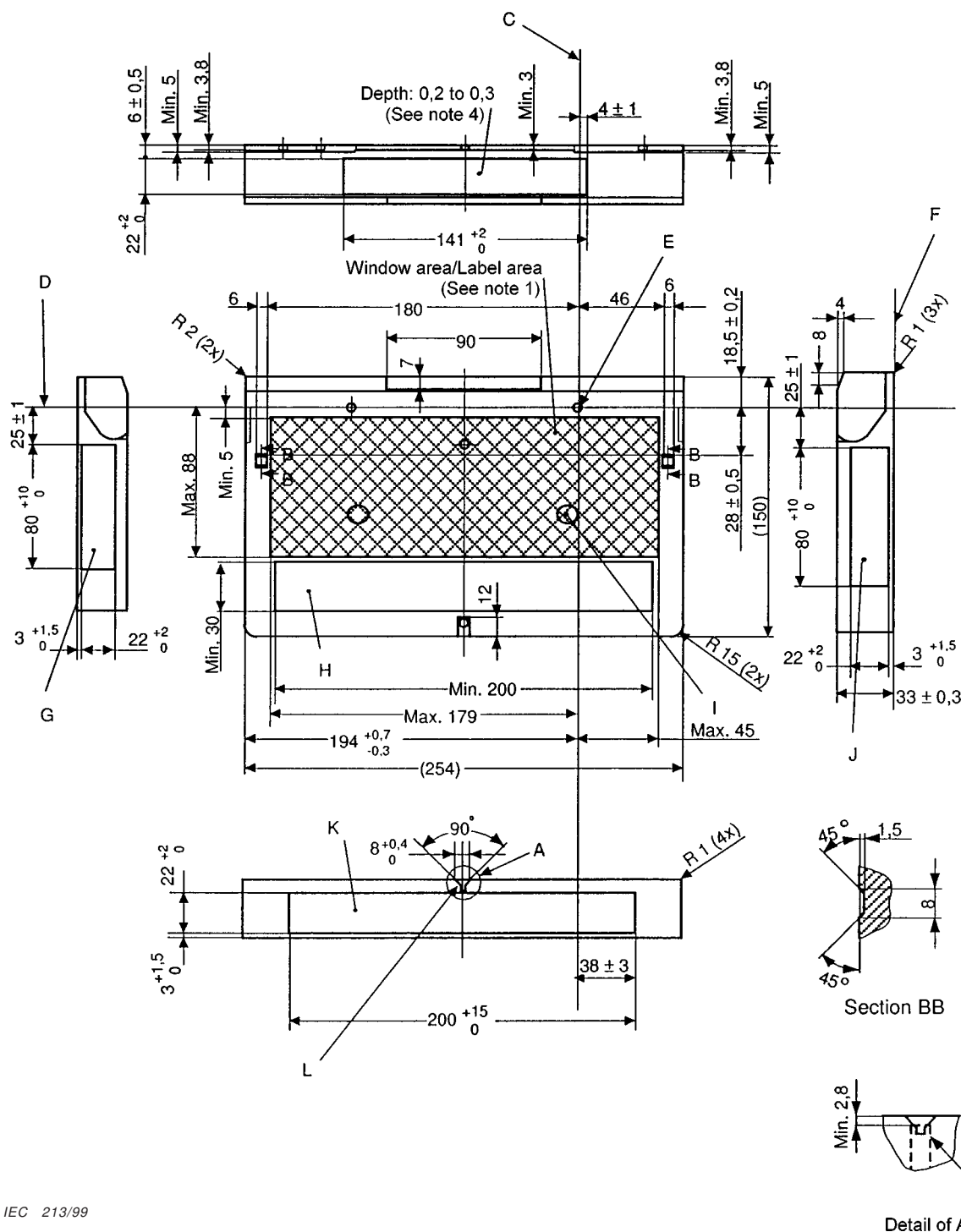
NOTE 2 – The side label may be attached to this recessed area.

NOTE 3 – The rear label may be attached to this recessed area.

NOTE 4 – The lid label may be attached to this recessed area.

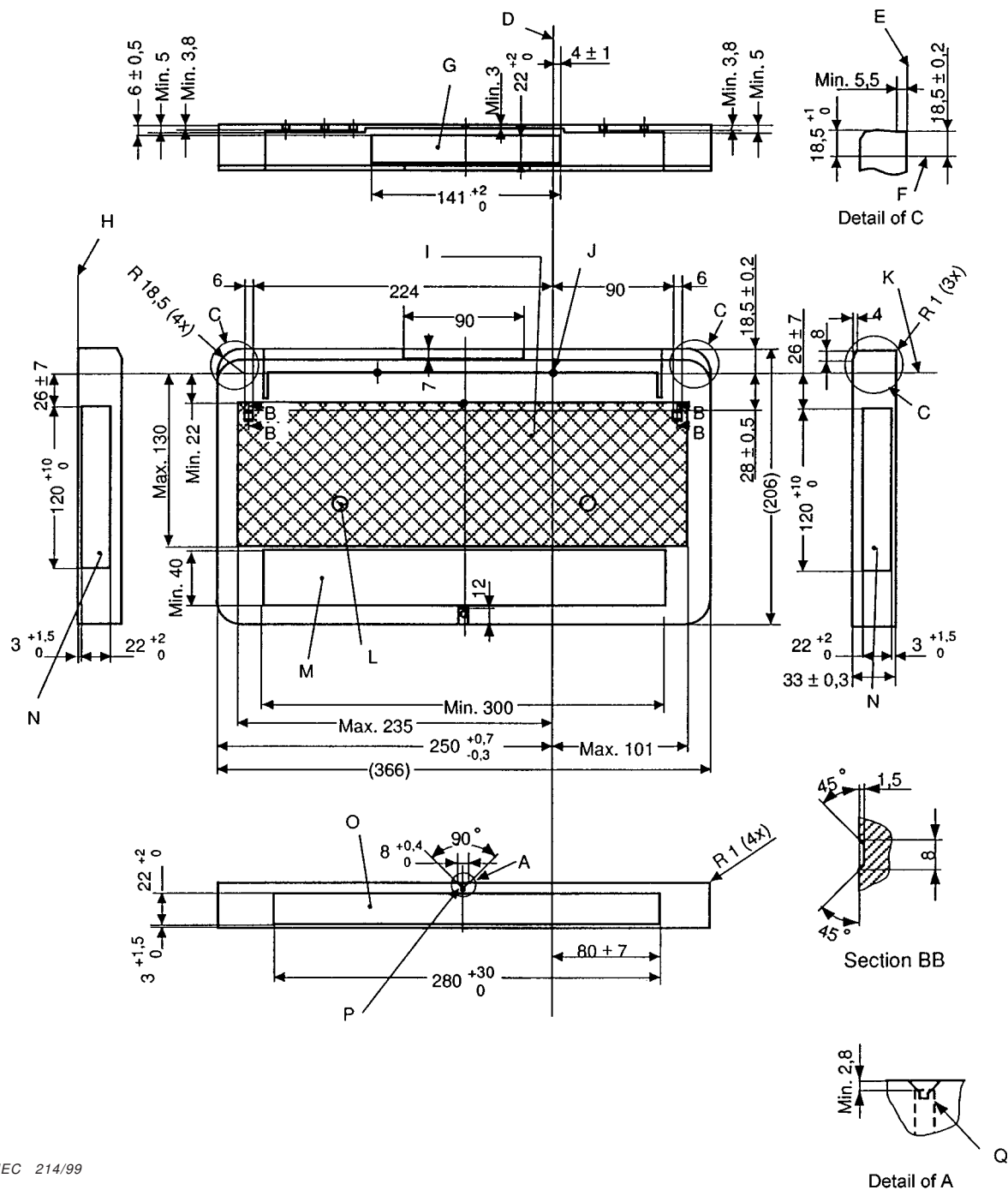
NOTE 5 – The top label may be attached to this recessed area.

Figure 10 – Top and side view of cassette S



Dimensions in millimetres

Figure 11 – Top and side view of cassette M



IEC 214/99

Key:

D	Datum plane Y	K	Datum plane X
E	Datum plane Z	L	See figure 17
F	Datum plane X	M	Depth: 0,2 to 0,3 (see note 5)
G	Depth: 0,2 to 0,3 (see note 4)	N	Depth: 0,2 to 0,3 (see note 2)
H	Datum plane Z	O	Depth: 0,2 to 0,3 (see note 3)
I	Window area/label area (see note 1)	P	Detent and misinsertion notch
J	4 user plugs (see figure 13)	Q	Configuration-optional user plug (2)

Dimensions in millimetres

- NOTE 1 – The cross-hatched area is available for the window/labels.
 NOTE 2 – The side label may be attached to this recessed area.
 NOTE 3 – The rear label may be attached to this recessed area.
 NOTE 4 – The lid label may be attached to this recessed area.
 NOTE 5 – The top label may be attached to this recessed area.

Figure 12 – Top and side view of cassette L

4.7 Identification holes

4.7.1 There shall be two sets of identification holes; one for use by the manufacturer and the other for the user.

4.7.2 Manufacturers' coding holes, detailed in Figures 13 to 15, shall be defined as follows:

Holes 1 and 2 shall be used in combination to indicate tape thickness according to the following logic table:

Hole numbers: 1 2

0 0	= 16 μ m tape
0 1	= 13 μ m tape
1 0	= Undefined/reserved
1 1	= Undefined/reserved

4.7.3 Holes 3 and 4 shall be used to indicate the coercivity of the magnetic recording tape.

Hole numbers: 3 4

0 0	= Class 850
0 1	= Undefined/reserved
1 0	= Undefined/reserved
1 1	= Undefined/reserved

4.7.4 A «0» in the above tables indicates that the indicator tab is removed or open, an undetected state by the recorder/player sensor mechanism.

4.7.5 The dimension and location of the users' holes specified in Figures 13 to 15 shall be defined as follows:

4.7.6 When a «0» state exists, the user holes shall identify the following conditions:

- 1) total record lock out (audio, video, cue, time code, control track);
- 2) reserved and undefined;
- 3) reserved and undefined;
- 4) reserved and undefined.

4.7.7 The user plug mechanism shall withstand an axial force of 0.5 N.

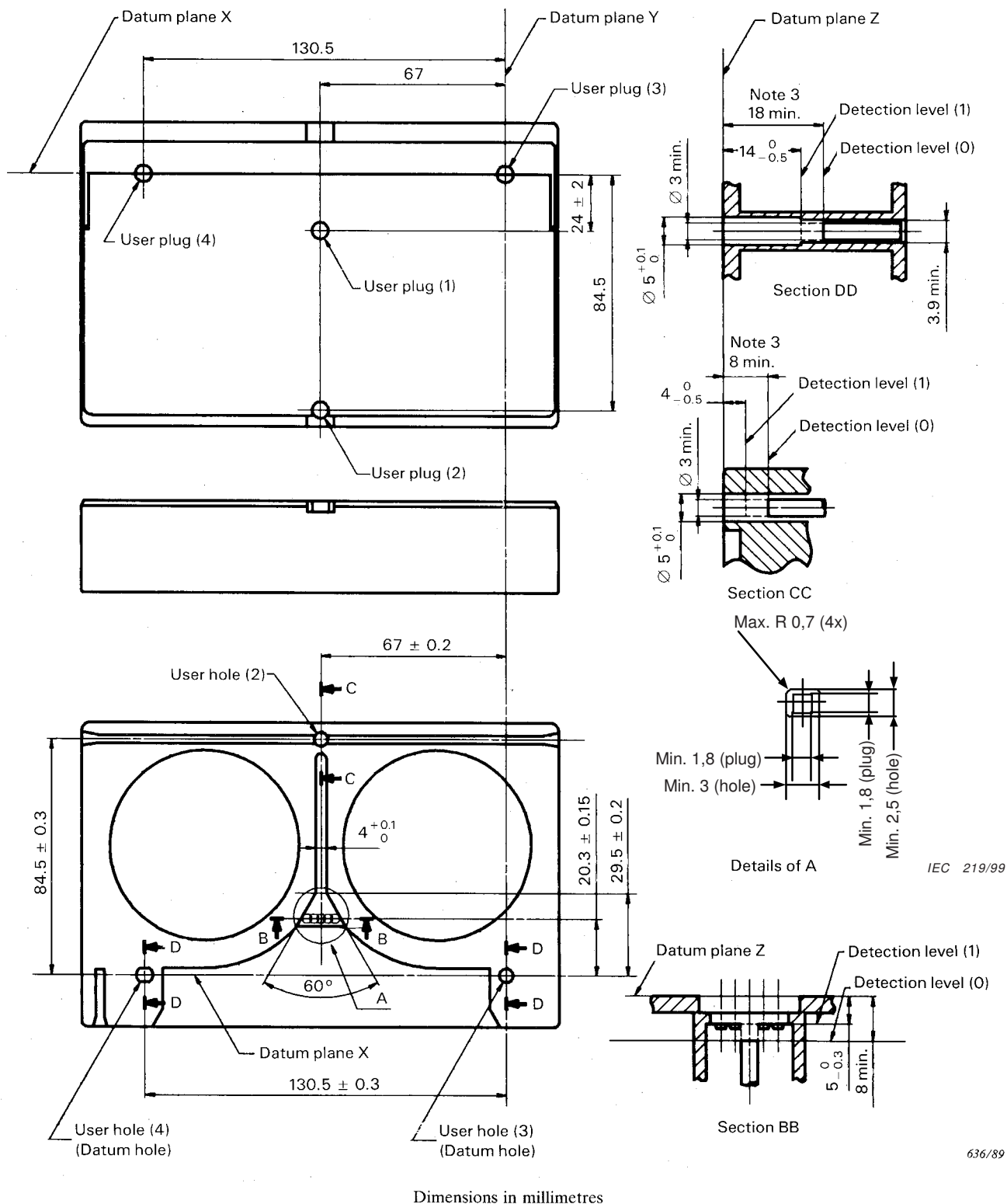


FIGURE 13 – D-1S cassette coding holes and user holes

- Notes 1. – The cassette shall be provided with four coding holes (1) to (4) and four user holes (1) to (4). When any plug is removed, the opening shall be as shown in detail A. The user plug (1) shall be green.
2. – User holes (3) and (4) on the upper shell shall be opened when user plugs are removed.
3. – All cassettes shall be provided with holes as defined by section DD and CC.

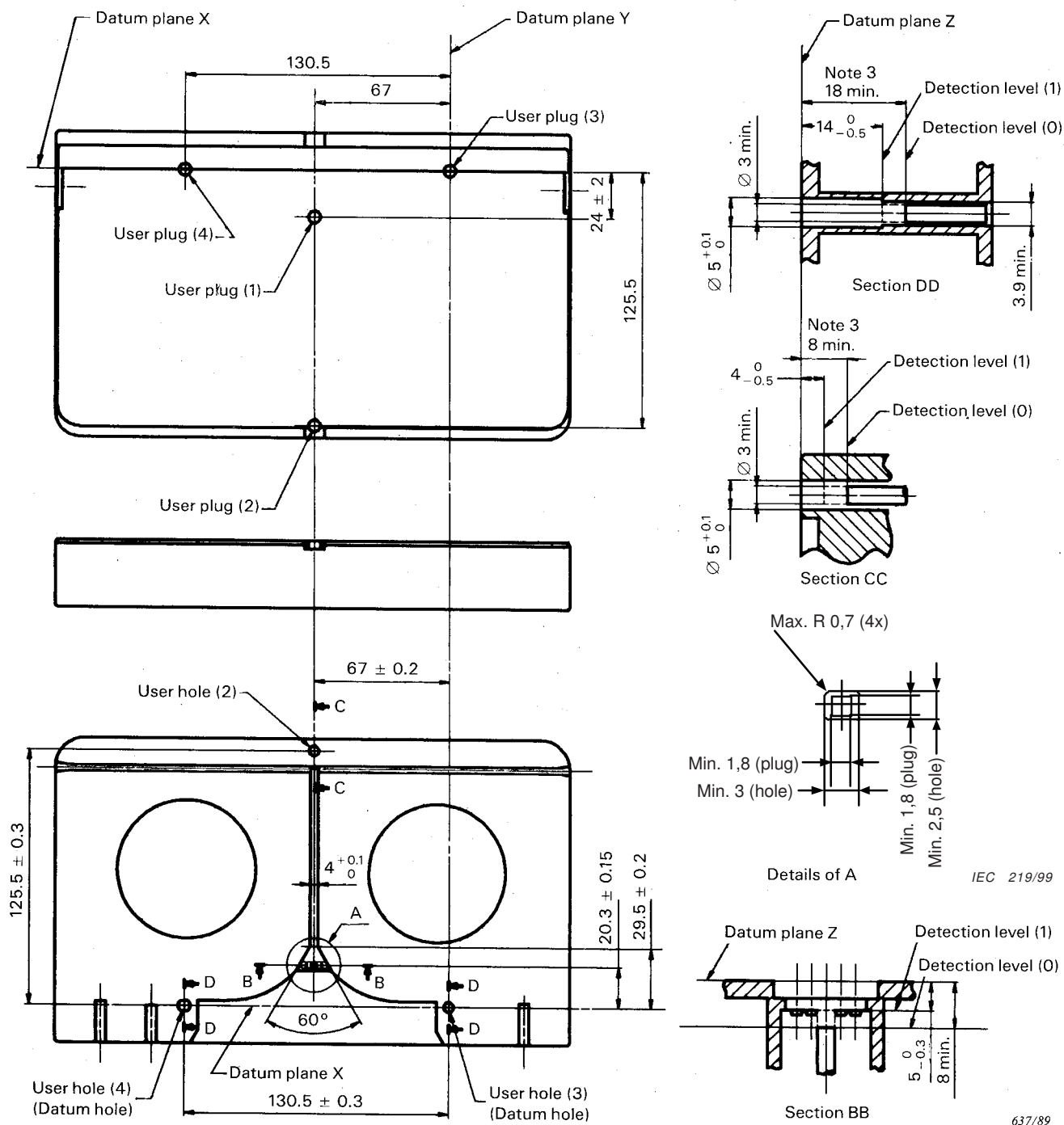


FIGURE 14 – D-1M cassette coding holes and user holes

Notes 1. – The cassette shall be provided with four coding holes (1) to (4) and four user holes (1) to (4). When any plug is removed, the opening shall be as shown in detail A. The user plug (1) shall be green.

2. – User holes (3) and (4) on the upper shell shall be opened when user plugs are removed.

3. – All cassettes shall be provided with holes as defined by section DD and CC.

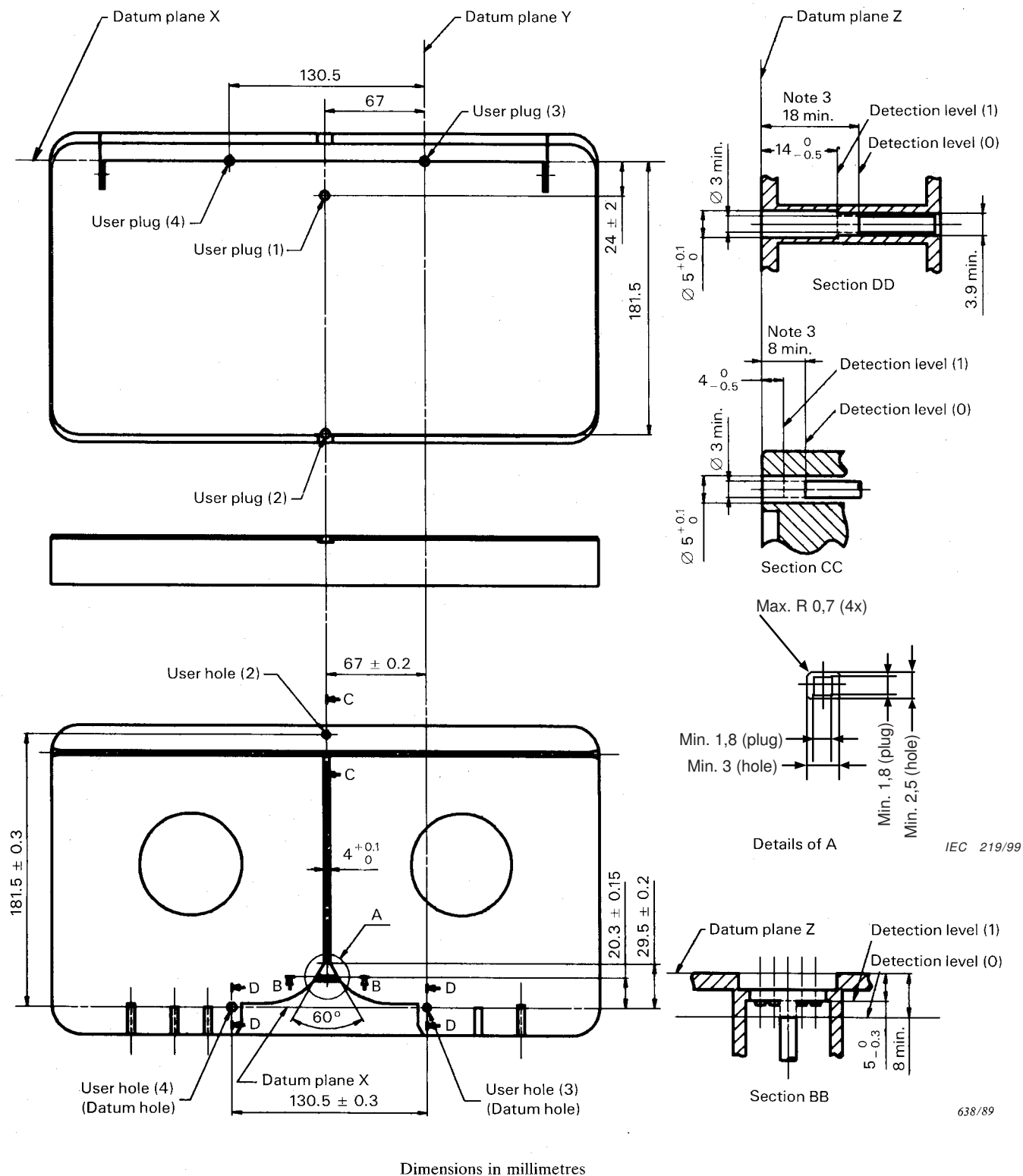


FIGURE 15 – D-1L cassette coding holes and user holes

Notes 1. – The cassette shall be provided with four coding holes (1) to (4) and four user holes (1) to (4). When any plug is removed, the opening shall be as shown in detail A. The user plug (1) shall be green.

2. – User holes (3) and (4) on the upper shell shall be opened when user plugs are removed.

3. – All cassettes shall be provided with holes as defined by section DD and CC.

4.8 *Leader/trailer tape*

4.8.1 The cassette shall include leader and trailer tape. When attached to the hub, there shall be a length of $300 \text{ mm} \pm 30 \text{ mm}$ between the splice point and the outside of the cassette shell.

4.8.2 The leader/trailer tape material shall be polyester or equivalent having a transmissivity of at least 60% when measured with a 700 nm to 900 nm light source.

4.8.3 When attached to the hub, the leader/trailer tape shall not separate when subjected to a force of 22 N or less.

4.8.4 The width of the leader/trailer tape shall be $19 \pm 0.025 \text{ mm}$.

4.8.5 The thickness of the leader/trailer tape shall be $20 \pm 10 \text{ }\mu\text{m}$.

4.8.6 The splicing tape used to attach the leader tape shall be applied to the non-magnetic side.

4.9 *Reels*

4.9.1 The dimensions of the reels and the relationship between the reels and reel tables are specified in Figures 16 and 17.

4.9.2 The reels shall be locked automatically when the cassette is removed from the recorder/player.

4.9.3 When a D-1S cassette is inserted into a recorder/player, the reels shall be unlocked automatically as specified in Figure 18.

The force needed to release the reel lock of the D-1S cassette shall be $0.5 \pm 0.1 \text{ N}$.

4.9.4 When a D-1M or D-1L cassette is inserted into a recorder/player, the reels shall be unlocked automatically by opening the lid as specified in Figures 19 and 20.

4.9.5 The reels shall be held in position by a reel spring with a force as shown in Table 3, when the height of the reel table support is $2.0 \pm 0.2 \text{ mm}$ from datum plane Z.