Electrician

陰極射線管

CATHODE RAY TUBES

前　言

華東電子管廠創建於1937年，是中國製造眞空電子器件和電光源最早的大型骨幹企業之一。主要生產各種類型的陰極射綫管、光敏管、輻射計數管、穩壓管、熒光燈及特種光源。此外，還生產吸氣劑、熒光粉、電眞空玻璃、以及電視機和多種電子儀器。工廠技術力量雄厚，生產設備精良。產品採用著名的“電工”商標。1987年工廠榮獲國家質量管理獎及國家、部和省優質產品獎。工廠以技術進步與產品開發爲依托，使產品不斷更新換代，在國內外用戶中贏得聲譽。

本產品樣本專門介紹本廠生產的各類陰極射綫管。如對產品性能需作進一步瞭解，或需獲取其它類型產品的技術介紹，函索即寄。

PREFACE

Established in 1937, Huadong (East-China) Electron Tube Factory is one of the big and back-bone enterprises with the longest history in producing electron vacuum devices and lighting sources, specializing mainly in the manufacture of various cathode-ray tubes, photosensitive tubes, radiation counter tubes, voltage stabilizer tubes, fluorescent lamps as well as special lighting sources. It also produces getters, phosphors, glass, TV sets and diverse electronic instruments.

Equipped with best machinery and technical staff, the factory employs the famous brand "ELECTRICIAN". In 1987 the factory won the Quality Control Prize from the State. Many products have been awarded one after another the Prize of Fine Quality Products from the State, Ministry and Province. Based on the technical progress and reaserch, the factory has been constantly developing new products and enjoys a high reputation both at home and abroad.

This catalogue is aimed to recommend you various cathode-ray tubes produced in the factory. For more information on specifications or inquiries on products of other types, please contact us and we will reply as soon as possible.

目錄 CONTENTS

雖然，早在本世紀三、四十年代，陰極射綫管的基本設計原理與工藝技術大體上已經確立，此後，技術改進和完善的步伐卻始終沒有停止。同樣，電工產品在不同時期也一直在進行着更新換代，以滿足用戶提出的各種各樣的要求。

盡管技術的發展使陰極射綫管品種日益增多，性能日趨完善，但仍然離不開電子槍、偏轉系統、熒光屏和管殼這四個功能性部件（如圖一）。

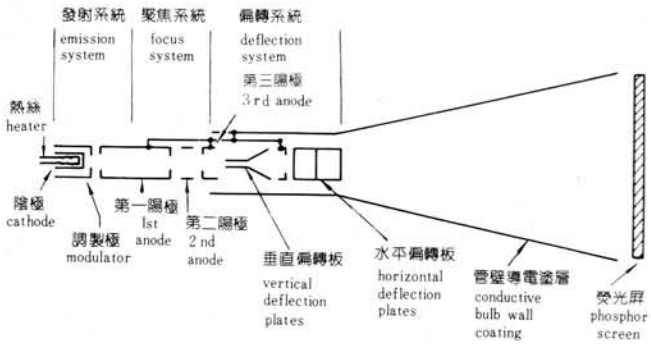


圖 1　陰極射線管結構示意圖

Fig. 1　A diagram of instrument CRT

電子槍

電子槍用以發射電子，并將其加速聚焦以形成電子束。通過信號的輸入，可以控制束電流的變化，達到調制電子束强度的目的。

電子槍由發射系統和聚焦系統兩部分構成。發射系統一般由熱絲、陰極、調制極和第一陽極構成；有時，爲使調制極的截止特性或調制特性不受聚焦電壓影響，在陽極和調制極之間增加一電壓較低的小孔電極，以提高對陽極電場的屏蔽能力。習慣上把前者稱爲三極式發射系統，後者稱爲四極式發射系統。陰極射綫管工作時，調制極總是處於相對於陰極爲負的電位上。通過改變調制極的電壓可以控制束電流的大小，從而控制熒光屏上電子束落點處光點的亮度。電子束截止時的調制極電壓值即爲截止電壓。在不同的應用場合，調制極可施加不同的訊號以獲得各種控制效果，示波管中加的是帶消隱的直流訊號，計算機顯示裝置採取脈冲工作，而電視顯像管則輸入視頻訊號來調制電子束。將陰極接地或置於某一個固定的電壓，而把信號加到調制極上，稱爲調制極調制；將調制極置於某一固定電壓而從陰極輸入倒相的信號，稱爲陰極調制，後者爲電視中常用的調制方式。

電子束從發射系統出來，即進入聚焦系統，發射系統本身對電子束具有一定的會聚作用，但主要的聚焦過程是在發射系統以後的一系列陽級、第二陽級、第三陽級、第四陽級

Since the basic design fundamental and process technology of cathode-ray tubes (CRTs) were generally established in the early 30s and 40s of this century, technic progress and improvement in this respect has been constantly developing and carrying out. Similarly, the products with brand "ELECTRICIAN" are being always developed and replaced in different period to meet diverse requirements of customers.

Though the technic development results in more and more varietyies and better and better performance, of CRT, their basic structure consists of four functional assemblies: the electron gun, the deflection system, the phosphor screen and the vacuum envelope (as shown in Fig. 1)

Electron Gun

The electron gun is used to produce electrons and form an elcetron beam through acceleration and focusing. By inputting a signal, it controls the variation of the beam current to modulate the intensity of the beam.

Electron gun consists of emission and focus systems. Emission system comprises a heater, a cathode, a modulator and a first anode. To make the modulation characteristics of the modulator independent of the focus voltage, sometimes an additional electrode with small aperture operated at a lower voltage is inserted between the anode and modulator in order to shield the electric field from the anode. The former system is commonly called "Triode", and the latter one "Tetrode". When CRT is operating, the modulator is always at negative potential with respect to the cathode. Through adjusting the voltage of the modulator the beam current is controlled so as to control the brightness of the phosphor screen on which the beam is directed. When the beam is just cut off, the value of modulator voltage is the cut-off voltage. In different applications, various driven signals can be applied to the modulator to obtain different results. In instrument tubes, a D.C. voltage with blanking signal is applied and the computer dispiay devices adopt pulse operating mode. In TV picture tubes, a video signal is input to modulate the electron beam. In case the cathode is grounding or it is set at a fixed voltage and a signal is applied to the modulator, it is referred to as the modulator drive. In case a fixed voltage is applied to the modulator, but a phaseinverted signal is input to the cathode, it is referred to as the cathode drive. The latter one is most common in use of TV.

Out from the emission system, the electron beam enters

等所構成的主聚焦透鏡內完成，就顯像管而言，兩者之間存在着由第一陽極和第二陽極所構成的預聚焦透鏡，這是顯像管電子光學系統的特點。此種安排可以使靜電聚焦型陰級射綫管具有良好的聚焦性能，保証高的分辨率。磁聚焦陰極射綫管的電子束着屏光點更爲精細，其瀰散電子比通常的靜電聚焦管要少。爲充分發揮磁聚焦的優良聚焦能力必須小心調整聚焦綫圈，使其與電子束同軸。也可在調制極所在的平面上裝置校正綫圈，以便將電子束調整到與電子槍軸綫一致。磁聚焦陰極射綫管雖可獲得很高的分辨率，但實用上附加的部件必然增加器件成本，運用時也比較麻煩，一般只用於雷達指示管和攝像管等器件。

偏轉系統

可分爲靜電偏轉系統和磁偏轉系統。靜電偏轉系統中，電子束依次進入兩對相互垂直的偏轉板。一般，置於熒光屏側的偏轉板爲水平偏轉板；置於電子槍側的偏轉板爲垂直偏轉板。兩對偏轉板間設有屏蔽極。加於偏轉板的電壓使每對偏轉板間形成偏轉電場。電子束在依次通過兩對偏轉板時，產生相互垂直的兩個方向的偏轉。磁偏轉系統中與束蹟垂直的磁場力將使電子束受到偏轉。此種磁場系由橫向安置於管頸外的一對綫圈所產生。

靜電偏轉的優點是工作頻率高，功耗小，但圖形畸變與光點散焦相對地要嚴重，適用於高掃描速度、小偏轉角的儀器用陰極射綫管；磁偏轉工作頻率低，功耗大，但圖形畸變與光點散焦均優於靜電偏轉，適用於低掃描速度、大偏轉角的顯示器件。示波管中，採用靜電編轉系統雖能滿足高速掃描的要求，但往往會產生偏轉靈敏度與亮度的矛盾。爲此，經常採取偏轉後加速方法來解決。圖2b爲單級後加速方式。圖2c爲螺旋綫偏轉後加速方式。在圖2d的網型偏轉後加速系統中，偏轉系統與熒光屏之間安置了網電極和數個屏蔽極。

熒光屏

熒光屏是陰極射綫管信號輸出顯示部位。在電子束的轟擊下，熒光粉發出可見光，完成電能與光能的轉換過程。

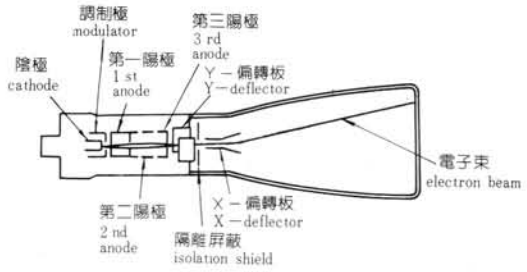
現代陰極射綫管，除工作電壓6KV以下的以外，其熒光屏的背面幾乎都進行鋁化工藝處理。鋁化的熒光屏可直接保持在陽極電位上，且使熒光屏指向管內輻射的光綫被鋁膜反射到觀察者一側，從而提高光輸出，改善對比度，還可以防止熒光屏在工作期間因受管內的負離子轟擊而出現離子斑。如果未經鋁化處理，當管子在高壓條件下工作時，熒光屏靠二次發射是不足以維持在陽極電位上的。但是鋁膜的存在，也會使穿透它的電子束消耗一部分能量。所以，低壓管子不採取鋁化處理。

into the focus system. Although the emission system itself has a certain convergent effect on the beam, the main focus function is accomplished by the principal lens comprising of a series of anodes (the second, third and fourth anodes etc.) which are located behind the emission system. For picture tubes, a prefocus lens consisting of first and second anode between both systems is located. Such arrangement enables CRT with electrostatic focus to have a good focus performance, and gain a high resolution. The light spot at the screen generated by the beam in CRT with magnetic focus is much more finner, and fringe electrons are less than those in tube with electrostatic focus. To fully take advantage of good resolution of magnetic focus, careful aligning the focus coil to be coaxial with the beam is necessary. Alternately, an alignment coil may be mounted at the plane where the modulator is located in order to adjust the beam to be aligned with gun axis. Though CRT with magnetic focus features a high resolution, its accessaries must make the coat increased and it is not convenient to use in practice So it is preferred in application of radar indicator tubes and camera tubes.

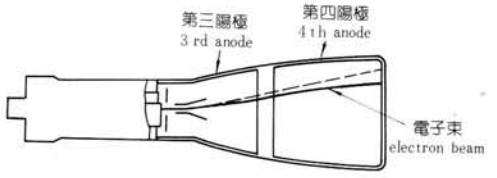
Deflection System

Two types of deflection systems are in common use: electrostatic and magnetic. In electrostatic system, the electron beam enters successively into two pairs of deflection plates which are perpendicular to each other. Generally, the deflection plate located at screen side is horizontal one, and that located at gun side is vertical one. There is a shield electrode between these two pairs of plates. The voltage applied to the deflection plates makes deflection field formed in each pair of plates. When the electron beam passes through both pairs of plates successively, a deflection in two directions perpendicular to each other is produced. In magnetic deflection system, a magnetic field force perpendicular to the beam path will make the beam deflected. Such field is generated by a pair of coils placed outside the tube neck transversely.

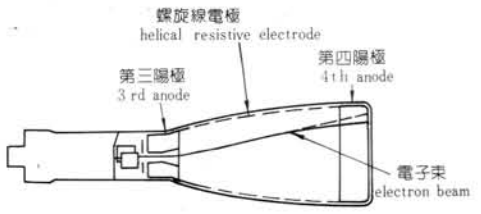
The electrostatic deflecion has an advantage of higher operation frequency and smaller power consumption, but a disadvantage of relatively severe distortion and defocucing. So it is appropriate for instrument CRT with high scanning speed and small deflection angle. Magnetic deflection has lower operation frequency, higher power consumption, but less distortion and defocucing. So it is appropriate for display devices with low scanning speed



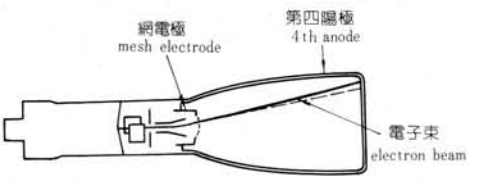
（a）單一加速型 mono accel. type



（b）單級後加速型 Post accel. type



（c）螺旋線偏轉後加速型 Halical post accel. type



（d）網電極偏轉後加速型 Mesh post accel. type

圖2 示波管的四種加速系統

Fig. 2 Four accelerator systems of instrument CRTs

管殼

陰極射綫管的管殼既作爲保持管內眞空的密封外殼，又是其熒光屏的基底和電子槍的支承體。管殼大多爲玻璃制品。技術的進展主要反映在作爲熒光屏基底的面板上：從球面到平面，從圓形到矩形，并發展了內刻度技術。爲滿足不同使用場合的需要，陰極射綫管的管殼外形種類繁多。

圍繞着上述基本的功能性部件，陰極射綫管的技術開發工作一直在不斷地進行。目前，本廠四大類七十五種陰極射綫管產品中，已普遍採用低功率陰極及內刻度技術；曲面網、四極透鏡及偏轉消隱等新技術已在部分新產品中獲得應用；電子計算機輔助設計已成爲新產品設計的重要手段，帶寬達300兆的寬帶示波管已開發成功并投入生產。爲滿足廣大用戶的需要，我廠將不斷努力創新。

and wide deflection angle. In instrument tubes, the electrostatic deflection system is able to meet requirements for rapid scanning, but it easily results in contradiction between the deflection sensitivity and screen brightness, and it is often solved by means of post deflection acceleration (PDA). Fig. 2b shows mono-acceleration type. Fig. 2c shows a helical PDA type. In the mesh PDA type as shown in Fig. 2d, a mesh electrode and a number of shield electrodes are mounted between the deflection system and screen.

Phosphor screen

The phosphor screen of CRT is the part where the visible signals are displayed. Under the bombardment of electron beam, the phosphor radiates visible light, conducting the conversion from the electrical energy to radiant energy. In modern CRT, except those which are operating at voltages below 6KV, screen aluminization is necessary to maintain the screen at the anode voltage and reflect the radiant energy from the inner screen to the observer. Thus the light output is increased, the contrast is improved and the ion spots due to the bombardment of negative ions during the operation of screen are avoided. Without aluminization, when CRT operates at a high voltage, the secondary emssion from the screen is not sufficient, so that the screen may not be operated at the anode voltage. However, the existence of aluminium layer consumes a part of beam energy, so the low voltage tube should not use aluminized screen.

Vacuum envelope

The CRT envelope, commonly a glass bulb, serves as the vacuum enclosure, the substrate for the phosphor screen and the support for the electron gun. Its technical progress is mainly reflected on the faceplate: from spherical to flat, from round to rectangular. The technology of internal graticule has even been developed. A great variety of CRT bulbs are available due to the requirements of diverse applications.

Reaserch and development of the CRT's fundamental functional parts described above has been conducting constantly. Now, the low power cathode and internal graticule technology is commonly used in more than 75 CRTs products of 4 categories produced in Huadong Electron Tube Factory. The technology of domed mesh, quadrupole lens and deflection blanking has been developed for the use of new type products. CAD has become an important means in the design of CRT. The wide band oscilloscope tube of 300MHz has been developed and put into production. Huadong Electron Tube Factory will make utmost efforts to serve customers with its excellent work.

1.國家標準命名法

陰極射線管型號由四部分組成。第一部分（數字）表示屏幕直徑或對角線長度（單位：厘米）；第二部分（字母）表示管子類型；第三部分（數字）表示產品序號；第四部分（字母或字母組合）表示熒光屏類型或熒光粉型號。具體命名規則見表1：

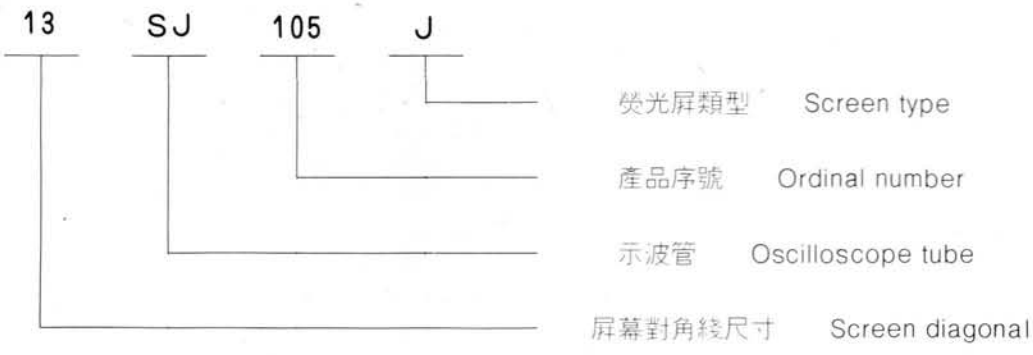
1. State standard nomenclature

CRT type consists of four parts. The first part (digits) shows the diameter or the diagonal of screen in cm. The second part (alphabets) represents the type of tubes The third part (digits) represents the ordinal number of the product. The fourth part (alphabet) shows the type of screen or phosphor. The details are shown in table 1:

表1 陰極射綫管型號組成表
Table 1 CRT Type Composition

第一部分 First part	第二部分 Second part		第三部分 Third part	第四部分 Fourth part	
表示屏幕直徑或對角綫長度(cm) The Diameter or the Diagonal of Screen in cm	SJ	示波管 Instrument Tube	表示同類型產品序號 Ordinal Number of the Product	A	發光顏色：藍色 余輝：短、中短 Fluorescence: Blue Persistence:Short、Medium Short
	SS	雷達指示管 Radar Indicator Tube		B	發光顏色：白色 余輝：中短 Fluorescence: White Persistence: Medium Short
	SX	顯像管 Picture Tube		D	發光顏色：白色 余輝：長 Fluorescence:White Persistence:Long
	SG	顯示(監視)管 Display (Monitor) Tube		J	發光顏色：綠、黃綠， 余輝：中、中短 Fluorescence: Green, Yellow - Green Persistence: Medium, Medium Short
	SC	直觀式儲存管 Direct-view StorageTube			
	ST	特種陰極射綫管 Special CRT		Yxx	熒光粉型號 Phosphor Type

示例 For example:



型號命名方法 NOMENCLATURE OF CRT TYPE

2.本廠命名法

本廠產品代號由四部分組成，第一部分（字母）區分產品大類；第二部分（1位數字）區分產品小類；第三部分（2位數字）表示同一小類產品序號；第四部分（1位數字）反映產品派生特徵情況的序號。

具體命名規則見表2：

2. Huadong factory standard nomenclature

The code number of the factory standard consists of four parts. The first part (alphabet) represents the basic category of products. The second part (one digit) represents subcategory of products. The third part (two digits) shows the ordinal number of the products. The fourth part (1 digit) represents the characteristics of products. The details are shown in table 2:

表2 本廠產品代號組成表

Code Number Composition of the Factory

產品名稱 Denomination	代號組成部分 Code No. Composition			
	第一部分 First part	第二部分 Second part	第三部分 Third part	第四部分 Fourth part
圓形屏示波管 Round Face Plate Instrument Tube	A	1	"01～99" 表示同類產品序號 "01～99" represents the ordinal number of the products.	"0" 表示基本產品號；"1～9" 表示派生產品序號 "0" represents the code of basic products, while "1～9" represents the ordinal number of derived products.
矩形屏示波管 Rectangular Face Plate Instrument Tube		2		
雙槍示波管 Double Gun Instrument Tube		3		
多槍示波管 Multi-Gun Instrument Tube		4		
指示管 Indicator Tube		6		
多色指示管 Multi-Color Indicator Tube		7		
顯示管 Display Tube	B	1		
彩色顯示管 Color Display Tube		2		
黑白顯像管 Black and White Picture Tube		3		
彩色顯像管 Color Picture Tube		4		
監視管 Monitor Tube		5		
彩色監視管 Color Monitor Tube		6		
非直視式儲存管 Indirect-View Storage Tube	C	1		
直視式儲存管 Direct-View Storage Tube		2		
非直視式特種陰線射線管 Indirect-View Special CRT	D	1		
直視式特種陰極射線管 Direct-View Special CRT		2		

示例 For example:

符號說明 SYMBOLS DENOTATION

H 熱絲或燈絲
Heater or Filament

K 陰極
Cathode

M 調制極
Modulator

M_1 第一調制極
1st Modulator

M_2 第二調制極或消隱極
2nd Modulator or
Blanking Electrode

M_E 網電極
Mesh Electrode

A 陽極
Anode

A_1 第一陽極
1st Anode

A_2 第二陽極
2nd Anode

A_3 第三陽極
3th Anode

A_4 第四陽極
4th Anode

S 屏蔽極
Shield Electrode

S_1 第一屏蔽極
1st Shield Electrode

S_2 第二屏蔽極
2nd Shield Electrode

S_3 第三屏蔽極
3rd Shield Electrode

S_4 第四屏蔽極
4th Shield Electrode

C 校正極
Correction Electrode

C_L 收集極
Collector

R 拒斥極
Repeller

E_C 外導電層
External Conductive Coating

D_1或X_1 水平偏轉板
Horizontal Deflection Plate

D_2或X_2 水平偏轉板
Horizontal Deflection Plate

D_3或Y_1 垂直偏轉板
Vertical Deflection Plate

D_4或Y_2 垂直偏轉板
Vertical Deflection Plate

$Y_{1.1}$，$Y_{2.2}$ 垂直偏轉板的第一對分段板
1st Sectioned Vertical
Deflection Plate

$Y_{1.1}$，$Y_{2.2}$ 垂直偏轉板的第二對分段板
2nd Sectioned Vertical
Deflection Plate

$Y_{1.3}$，$Y_{2.3}$ 垂直偏轉板的第三對分段板
3rd Sectioned Vertical
Deflection Plate

$Y_{1.4}$，$Y_{2.4}$ 垂直偏轉板的第四對分段板
4th Sectioned Vertical
Deflection Plate

1M …… 字母前的數字表示多槍管中各槍的順序號。 1M表示第一槍的調制極， 其余依此類推。

The digits before the alphabet represent the ordinal number of gun in multi-gun tube. IM shows the modulator of the first gun, and so on and so forth.

熒光粉類型和特性 TYPE AND CHARACTERISTICS OF PHOSPHORS

熒光粉型號 Phosphor Type	化學組成 Composition	發光顏色 Fluorescence	余輝顏色 Phosphorescence	余輝 Persistence	發射光譜主峯 Spectral Peak (nm)	主要用途 Typical Application	相應的國外型號 Type to be Replaced
YI	硅酸鋅：錳 Zn_2SiO_4:Mn	綠 Green	綠 Green	中 Medium	525	示波顯示 Oscilloscope Display	PI K—35
Y3	硫化鋅：銀 ZnS:Ag	藍紫 Blue Purple	藍紫 Blue Purple	中短 Medium Short	435	雙屏屏示波顯示 Oscilloscope Display of Double Coating Screen	P7B K—430
Y4—W2	硫化鋅鎘：銅、鋁 (Zn,Cd)S:Cu,Al 硫化鋅：銀 ZnS:Ag	白 White	白 White	中 Medium	560 458	黑白電視顯示 B/W TV Display	P4K
Y10	硫化鋅：銀、鎳 ZnS:Ag,Ni	藍 Blue	藍 Blue	短 Short	455	攝影記錄、示波顯示 Photograph Recording Oscilloscope Display	K—9
Y14	硫化鋅：銅 ZnS:Cu	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	530	示波顯示 Oscilloscope Display	P31
Y19	硅酸鋅：錳、砷 Zn_2SiO_4:Mn,As	綠 Green	綠 Green	長 Long	525	低速文字顯示 Medium Frame Rate Visual Display	P39
Y20	硫化鋅鎘：銀 (Zn,Cd)S:Ag	黃綠 Yellow Green	黃綠 Yellow Green	中 Medium	540	貯存顯示 Storage Display	P20
Y22—R_1	矾酸鉱：銪 YVO_4:Eu	紅 Red	紅 Red	中短 Medium Short	619	彩色電視顯示 Color TV Display	P22R
Y22—B_1	硫化鋅：銀 ZnS:Ag	藍 Blue	藍 Blue	中短 Medium Short	440	彩色電視顯示 Color TV Display	P22B
Y22—G_1	硫化鋅鎘：銅、鋁 (Zn,Cd)S:Cu,Al	黃綠 Yellow Green	黃綠 Yellow Green	中 Medium	530	彩色電視顯示 Color TV Display	P22G
Y27*	GII硫化鋅鎘：銅 (87Zn,13Cd)S:Cu Y3(Y4)硫化鋅：銀 ZnS:Ag	白 White	橙黃 Orange Yellow	長 Long	565 435 (455)	雷達顯示 Radar Display 雙層屏示波顯示 Oscilloscope Display of Double Coating Screen	P7 Л—15 K—430
Y41*	硫化鋅：銅、氯 ZnS:Cu,Cl	綠 Green	綠 Green	中短 Medium Short	532,470	示波顯示 Oscilloscope Display 攝影記錄 Photograph Recording	P31H

注：1. 有"*"者爲本廠型號；
2. 根據用戶的不同需要，本廠可以制造其它型號的熒光粉及熒光屏。

Note: 1. "*" Show the type of this factory.
2. Phosphors of other types and screens can be manufactured according to the special requirement from customers.

1.熱絲供電電壓

熱絲供電電壓不足會導致陰極發射性能不良，而電壓過高則會縮短管子壽命。因此，熱絲供電電壓的變動範圍應控制在±10%以內。

2.典型工作條件

典型工作條件是在管子額定值範圍內優先推薦的工作條件。建議盡可能使管子在典型工作條件下工作，以獲得規定的特性指標。

3.管子的安裝與固定

在安裝以前，應將管子存放在包裝箱或類似的保護容器中。要防止強環境光長期照射熒光屏，以免熒光屏發黑，影響管子亮度。凡在有未加包裝的管子區域內，現場工作人員應穿保護工作服、戴手套和有側面屏蔽的保護眼鏡，以免一旦發生管子爆炸時，遭受玻片傷害。管子在安裝與固定時不應取屏面朝下的位置；有防爆帶的管子一定要利用防爆帶上的定位件進行固定，無防爆帶的管子不應直接用金屬固定件進行固定，在金屬固定件與玻殼之間要採用輭襯墊物填實；管座接線時，應使用輭線連結，不應採取直接接插。管子插入或退出管座時，不能用力過猛，特別是管子的封接部位更要小心處置。

4.防電擊

設計整機時應考慮安全措施，防止使用者接觸高壓。高壓電路維修時，要極其小心防止電擊。設備斷電以後，由於陰極射線管的內外導電層所形成的高壓電容仍殘留電荷，人體接觸也能造成電擊。故在替換管子前，應先將陽極引出電極與管外導電層短路放電後方能操作。

1. Heater voltage supply

Insufficient voltage will result in inadequate cathode performance. Excessive voltage will shorten the life of the tube. So the fluctuation of the heater voltage supply should be controlled within ±10%.

2. Typical operating conditions

Typical operating conditions are the conditions preferentially recommended within the rating. It is important to use the tube under the typical operating conditions so as to obtain the specified characteristics.

3. Installation and fixing

Until the installation, the tube should be stored in a package or a similar protection vessel, and kept from a long time irradation by strong ambient light to avoid the screen darkening so as to reduce the luminance of tubes. In area where unpacked tubes are placed operators should wear protection clothes, gloves and side-shielding glasses to avoid injury from bits of broken glass when an implosion of tubes happens.

During the installation and fixing, the screen is prohibited to be downward. The tube with implosion protection band must be fixed by means of the positioner of the band. The tube without implosion protection band should not be fixed directly by a metal positioner and a cushion should be set between the metal positioner and glass bulb.

In connection with the wire of the CRT socket, a flexible wire should be used, and do not fix the socket directly.

Care should be taken for plugging in or pulling out of the base, especially for sealed area.

4. Shock-proof

Safety measures should be taken into consideration during the instrument design to prevent operators from contacting with the high voltage. A special care should be taken in the servicing of high voltage circuit. After the instrument is disconnected, residual electrical charge may be remained on the high voltage capacitor formed by internal and external conductive coating of CRT. Shock is possible to happen upon contacting by people. Thus, in case of replacement, operators should start work only after discharging by short circuit of outlet electrode of anode and external conductive coating.

示波管

單槍示波管 SINGLE GUN INSTRUMENT TUBES

屏幕尺寸 Screen Size (cm)	型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	有效工作面 Useful Screen (mm)	螢光屏 Screen			熱絲額定值 Heater Rating	
						發光顏色 Fluorescence	余輝顏色 Phosphores-cence	余輝 Persistence	電壓 Voltage (V)	電流 Current (A)
3	3SJ1J	φ30±1	105±5	30±1	18 X 18	黃綠 Yellow Green	黃綠 Yellow Green	中短 Modium Short	6.3	0.6
8	8SJ31A	φ76±2	254±7	51±2	60 X 40	藍 Blue	藍 Blue	短 Short	6.3	0.6
	8SJ3ID	φ76±2	254±7	51±2	60 X 40	白 White	橙黃 Orange Yellow	長 Long	6.3	0.6
	8SJ3IJ	φ76±2	254±7	51±2	60 X 40	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.6
	8SJ40A	φ76±2	267±7	51±2	60 X 40	藍 Blue	藍 Blue	短 Short	6.3	0.6
	8ST40D	φ76±2	267±7	51±2	60 X 40	白 White	橙黃 Orange Yellow	長 Long	6.3	0.6
	8SJ40J	φ76±2	267±7	51±2	60 X 40	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.6
	8SJ45J	φ76±2	277±5	51±2	60 X 45	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.6

注： S—單級後加速

H—螺旋綫後加速

3SJ1

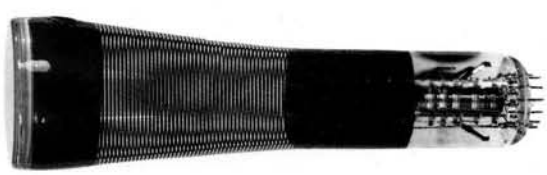
8SJ31

典型工作條件 Typical Operating Conditions							外形圖 Outling Drawing	管基接綫圖 Base Connection Diagram	備注 Remarks
第四陽極電壓 4th Anode Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)	偏轉因數 Deflection Factor (V/cm) 水平 Horizontal	偏轉因數 Deflection Factor (V/cm) 垂直 Vertical			
	650	30～150	650	−15～−50	48～83.5	38～55.6	OD101	BCD101	
	1500	250～400	1500	−35～−70	28.6～40	19.2～26.3	OD102	BCD102-1	
	2000	250～460	2000	−40～−90	40～55.6	25～33.3	OD102	BCD102-1	
	1500	250～400	1500	−35～−70	28.6～40	19.2～26.3	OD102	BCD102-1	
3000	1500	220～400	1500	−30～−90	40～62.5	22.2～28.6	OD103	BCD102-2	S
4000	2000	320～480	2000	−40～−100	45.5～77	28.6～47.6	OD103	BCD102-2	S
3000	1500	220～400	1500	−30～−90	40～62.5	22.2～28.6	OD103	BCD102-2	S
1600	400±50	180～360	1500	−20～−60	8.3～12.5	5.0～6.6	OD104	BCD103	H

REMARKS: S—Single Stage Post Acceleration

H—Helical Post Acceleration

8SJ40



8SJ45

示波管

單槍示波管　SINGLE GUN INSTRUMENT TUBES

屏幕尺寸 Screen Size (cm)	型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	有效工作面 Useful Screen (mm)	螢光屏 Screen			熱絲額定值 Heater Rating	
						發光顏色 Fluorescence	余輝顏色 Phosphores-cence	余輝 Persistence	電壓 Voltage (V)	電流 Current (A)
9	9SJ105Y14	73.6 X 62	239±5	51±2	60 X 48	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15
	9SJ106Y14	76.4 X 63.8	235±5	51±2	63.5 X 50.8	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15
	9SJ107Y14	76.4 X 63.8	236±5	41.3±1.6	63.5±50.8	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.095
	9SJ108Y14	76.4 X 63.8	257±5	41.3±1.6	63.5 X 50.8	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.095
10	10SJ101Y14	82 X 69	255±5	51±2	65 X 52	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.095
	10SJ102Y14	82 X 69	220±5	51±2	62 X 52	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.095
	10SJ102Y41	82 X 69	220±5	51±2	65 X 52	綠 Green	綠 Green	中短 Medium Short	6.3	0.095

注：M—多級後加速
MP—网後加速
BE—消隱電極
IG—內刻度
AL—鋁化屏

9SJ105

9SJ107

典型工作條件 Typical Operating Conditions							外形圖 Outline Drawing	管基接線圖 Base Connection Diagram	備注 Remarks
第四陽極電壓 4th Anode Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)	偏轉因數 Daflection Factor (V/cm) 水平 Horizontal	偏轉因數 Daflection Factor (V/cm) 垂直 Vertical			
	1500±75	100~350	1500	−30~−90	32	16	OD105	BCD104	IG
8000	1200±50	100~300	1200	−30~−90	15~18.5	7~9	OD106	BCD105	MP,IG,AL
	1500±75	200~500	1500±75	−40~−70	26.4~32.4	13~16	OD107	BCD106	BE, IG
	1500±75	100~300	1500±75	−30~−90	23.1~29.1	12~16	OD108	BCD107	IG
4000	2000±150	120~300	2000	−45~−95	≤42	≤32	OD109	BCD108	M
9000	1500±100	0~200	1500	−40~−120	21~26	21~26	OD110	BCD109	MP,IG,AL
9000	1500±100	0~200	1500	−40~−120	21~26	21~26	OD110	BCD109	MP,IG,AL

REMARKS: M—Multi Stage Post Acceleration
MP—Mesh PDA
BE—Blanking Electrode
IG—Internal Graticule
AL—Aluminized Screen

10SJ101

10SJ102

示波管

單槍示波管　　SINGLE GUN INSTRUMENT TUBES

屏幕尺寸 Screen Size (cm)	型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	有效工作面 Useful Screen (mm)	螢光屏 Screen			熱絲額定值 Heater Rating	
						發光顏色 Fluorescence	余輝顏色 Phosphores-cence	余輝 Persistence	電壓 Voltage (V)	電流 Current (A)
12	12SJ102J	100 X 80	370±10	51±2	80 X 60	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.6
	12SJ104Y14	98 X 84	315±5	51±2	80 X 64	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15
	12SJ104Y27	98 X 84	315±5	51±2	80 X 64	白 White	橙黃 Orange Yellow	長 Long	6.3	0.15
	12SJ105Y14	98 X 84	315±5	51±2	80 X 64	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15
	12SJ105Y27	98 X 84	315±5	51±2	80 X 64	白 White	橙黃 Orange Yellow	長 Long	6.3	0.15
	12SJ106Y14	98 X 84	368±10	51±2	80 X 64	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15
	12SJ107Y14	98 X 84	260±5	51±2	80 X 64	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.095

注：H—螺旋綫後加速
　　MP—网後加速
　　SC—偏轉板旁側引出
　　IG—內刻度
　　AL—鋁化屏

12SJ102

12SJ105

典型工作條件 Typical Operating Conditions							外形圖 Outling Drawing	管基接綫圖 Base Connection Diagram	備注 Remarks
第四陽極電壓 4th Anode Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)	偏轉因數 Deflection Factor (V/cm) 水平 Horizontal	偏轉因數 Deflection Factor (V/cm) 垂直 Vertical			
3000	1000±100	200~450	1600	−30~−80	12~14.5	6~8	OD111	BCD103	H
6000	1200±75	50~250	1200	−35~−100	13~14	5~6.5	OD112	BCD105	MP,IG
8000	1500±75	50~250	1500	−40~−105	16~18	6~8	OD112	BCD105	MP,IG
6000	1200±75	50~250	1200	−35~−100	13~14	5~6.5	OD112	BCD105	MP,IG
8000	1500±75	50~250	1500	−40~−105	16~18	6~8	OD112	BCD105	MP,IG
12000	1500±75	150~410	1500	−40~−110	8.5~12	2.5~4	OD113	BCD110	MP,SC,IG, AL
9000	1500±150	0~200	1500	−40~−120	17~19	10~12	OD114	BCD109	MP,IG,AL

REMARKS: H—Helical Post Acceleration
MP—Mesh PDA
SC—Plates Side Pin Contact
IG—Internal Graticule
AL—Aluminized Screen

12SJ106

12SJ107

示波管

單槍示波管　　SINGLE GUN INSTRUMENT TUBES

屏幕尺寸 Screen Size (cm)	型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	有效工作面 Useful Screen (mm)	螢光屏 Screen			熱絲額定值 Heater Rating	
						發光顏色 Fluorescence	余輝顏色 Phosphores-cence	余輝 Persistence	電壓 Voltage (V)	電流 Current (A)
13	13SJ38A	φ133±3	430±5	51±2	100 X 80	藍 Blue	藍 Blue	短 Short	6.3	0.6
	13SJ38D	φ133±3	430±5	51±2	100 X 80	白 White	橙黃 Orange Yellow	長 Long	6.3	0.6
	13SJ38J	φ133±3	430±5	51±2	100 X 80	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.6
	13SJ58A	φ133±3	380±5	51±2	100 X 80	藍 Blue	藍 Blue	短 Short	6.3	0.6
	13SJ58D	φ133±3	380±5	51±2	100 X 80	白 White	橙黃 Orange Yellow	長 Long	6.3	0.6
	13SJ58J	φ133±3	380±5	51±2	100 X 80	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.6
	13SJ105J	120 X 88	45±7	51±2	100 X 60	綠 Green	綠 Green	中短 Medium Short	6.3	0.15
14	14SJ102Y14	120.5 X 96.5	310±5	51±2	95 X 76	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15

注：S—單級後加速
H—螺旋綫後加速
MP—网後加速
SC—偏轉板旁側引出
SD—分段偏轉板
IG—內刻度
AL—鋁化屏

13SJ38

13SJ58

典型工作條件 Typical Operating Conditions							外形圖 Outline Drawing	管基接線圖 Base Connection Diagram	備注 Remarks
第四陽極電壓 4th Anode Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)	偏轉因數 Deflection Factor (V/cm) 水平 Horizontal	偏轉因數 Deflection Factor (V/cm) 垂直 Vertical			
3000	1500	300~515	1500	−35~−70	15.8~21.2	10.6~14.2	OD115	BCD102-2	S
4000	2000	374~690	2000	−45~−90	21.1~28.3	13.7~18.9	OD115	BCD102-2	S
3000	1500	300~515	1500	−35~−70	15.8~21.2	10.6~14.2	OD115	BCD102-2	S
3000	1500	300~515	1500	−35~−85	15.8~21.2	10.6~14.2	OD116	BCD102-2	H
4000	2000	374~690	2000	−45~−95	21.1~28.3	13.7~18.9	OD116	BCD102-2	H
3000	1500	300~515	1500	−35~−85	15.8~21.2	10.6~14.2	OD116	BCD102-2	H
15000	1500±100	400~600	1500	−40~−100	8~10	2.3~3.5	OD117	BCD111	MP SC SD IG, AL
6000	1500±100	350~570	1500	−40~−84	12.5~13.5	5.3~6.3	OD118	BCD112−1	MP,IG

REMARKS: S—Single Stage Post Acceleration
H—Helical Post Acceleration
MP—Mesh PDA
SC—Plates Side Pin Contact
SD—Separated Deflector
IG—Internal Graticule
AL—Aluminized Screen

13SJ105

14SJ102

示波管

單槍示波管 SINGLE GUN INSTRUMENT TUBES

屏幕尺寸 Screen Size (cm)	型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	有效工作面 Useful Screen (mm)	熒光屏 Screen			熱絲額定值 Heater Rating	
						發光顏色 Fluorescence	余輝顏色 Phosphores-cence	余輝 Persistence	電壓 Voltage (V)	電流 Current (A)
15	15SJ109Y14	120 X 100	385±5	51±2	100 X 80	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15
	15SJ109Y41	120 X 100	385±5	51±2	100 X 80	綠 Green	綠 Green	中短 Medium Short	6.3	0.15
	15SJ110Y14	124 X 104	380±5	51±2	100 X 80	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15
	15SJ114Y14	122 X 104	327±5	51±2	100 X 80	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15 0.095
	15SJ116Y14	122 X 104	327±5	51±2	100 X 80	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15 0.095
	15SJ118Y14	122 X 104	325±10	41.3±1.6	100 X 80	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.15 0.095
	A2180	122 X 104	380±7	51±2	100 X 80	綠 Green	綠 Green	中短 Medium Short	6.3	0.15
	A2181	122 X 104	380±7	51±2	100 X 80	綠 Green	綠 Green	中短 Medium Short	6.3	0.15
16	16SJ101A	130 X 108	455±5	51±2	100 X 80	藍 Blue	藍 Blue	短 Short	6.3	0.6
	16SJ101D	130 X 108	455±5	51±2	100 X 80	白 White	橙黃 Orange Yellow	長 Long	6.3	0.6
	16SJ101J	130 X 108	455±5	51±2	100 X 80	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	0.6

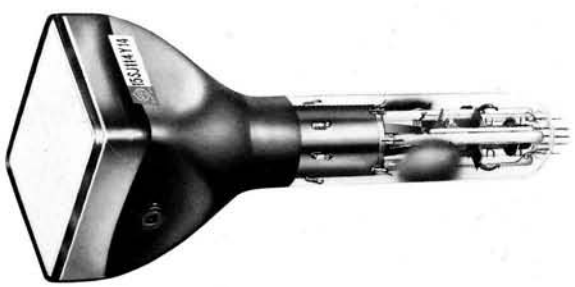
注：H—螺旋綫後加速
MP—网後加速
SC—偏轉板旁側引出
IG—內刻度
AL—鋁化屏

15SJ109

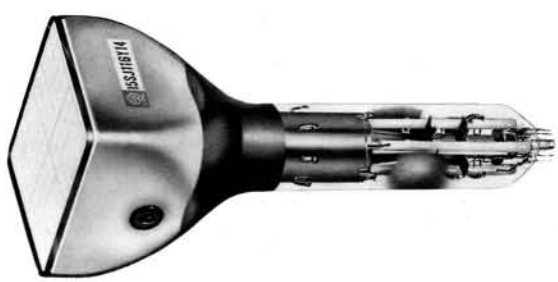
15SJ110

典型工作條件 Typical Operating Conditions							外形圖 Outling Drawing	管基接線圖 Base Connection Diagram	備注 Remarks
第四陽極電壓 4th Anode Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)	偏轉因數 Deflection Factor (V/cm) 水平 Horizontal	偏轉因數 Deflection Factor (V/cm) 垂直 Vertical			
16500	2200±150	600~800	2200	−60~−120	≤10.5	≤5.3	OD119	BCD113	MP,SC, IG, AL
15000	1500±150	400~600	1500	−40~−100	≤7.5	≤4.0			
3000	1500±150	300~500	1500	−30~−90	14~17	8.5~10.5	OD120	BCD114	H,IG
6000	1500±100	400~600	1500	−40~−100	8~11	3~5	OD121	BCD112−1	MP,IG
12000	2000±100	600~800	2000	−40~−100	10.5~13	3.5~6	OD122	BCD112−2	MP,IG,AL
	2000±100	250~450	2000	−40~−90	19~21.6	10.8~13.2	OD123	BCD107	IG
20000	2000±75	800±100	2000	−45~−100	7.3~9.3	2~3.2	OD124	BCD115	MP,IG,AL
20000	2000±75	800±100	2000	−45~−100	7.3~9.3	2~3.2	OD125	BCD116	MP,IG,AL
3000	1500±150	400~600	1500	−30~−90	11.7~14.3	6~8	OD126	BCD103	H
4000	2000±150	450~750	2000	−50~−110	15~22	8.3~11.5	OD126	BCD103	H
3000	1500±150	400~600	1500	−30~−90	11.7~14.3	6~8	OD126	BCD103	H

REMARKS: H—Helical Post Acceleration
MP—Mesh PDA
SC—Plates Side Pin Contact
IG—Internal Graticule
AL—Aluminized Screen



15SJII4



15SJ116

示波管

多槍示波管　MULTI-GUN INSTRUMENT TUBES

屏幕尺寸 Screen Size (cm)	型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	有效工作面 Useful Screen (mm)	螢光屏 Screen			熱絲額定值 Heater Rating	
						發光顏色 Fluorescence	余輝顏色 Phosphores-cence	余輝 Persistence	電壓 Voltage (V)	電流 Current (A)
13	13SJ22A	φ133±3	430±10	63±1	100 X 60	藍 Blue	藍 Blue	短 Short	6.3	1.2
	13SJ22D	φ133±3	430±10	63±1	100 X 60	白 White	橙黃 Orange Yellow	長 Long	6.3	1.2
	13SJ22J	φ133±3	430±10	63±1	100 X 60	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	1.2
	13SJ104J	104 X 104	405±5	63±1	80 X 70	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	1.2
16	16SJ48Y14	φ157±1	445±5	93±1	90 X 90	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	2.4
25	25SJ201Y14	206 X 182	465±5	85±2	160 X 130	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	1.2
	25SJ201Y27	206 X 182	465±5	85±2	160 X 130	白 White	橙黃 Orange Yellow	長 Long	6.3	1.2
	25SJ501D	200 X 200	500±10	95±1	150 X 150	白 White	橙黃 Orange Yellow	長 Long	6.3	3
	25SJ501J	200 X 200	500±10	95±1	150 X 150	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short	6.3	3

注：S—單級後加速
M—多級後加速
H—螺旋綫後加速

DG—雙槍
QG—四槍
PG—五槍

13SJ22

13SJ104

典型工作條件 Typical Operating Conditions							外形圖 Outling Drawing	管基接線圖 Base Connection Diagram	備注 Remarks
第四陽極電壓 4th Anode Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)	偏轉因數 Deflection Factor (V/cm) 水平 Horizontal	偏轉因數 Deflection Factor (V/cm) 垂直 Vertical			
3000	1500	350~550	1500	−30~−90	15.8~21.2	10.6~14.2	OD127	BCD117	S,DG
4000	2000	515~730	2000	−50~−100	20.8~28.6	14.3~21	OD127	BCD117	S,DG
3000	1500	350~550	1500	−30~−90	15.8~21.2	10.6~14.2	OD127	BCD117	S,DG
3500	1400	180~380	1400	−40~−100	13~17	8.5~11.7	OD128	BCD118	H,DG
3800	1800±150	350~700	1800	−30~−100	≤28.6	≤28.6	OD129	BCD119	H,QG
3000	1500±150	100~400	1500	−35~−100	≤18	≤13	OD130	BCD118	H,DG
4000	2000±150	150~500	2000	−35~−120	≤22	≤17	OD130	BCD118	H,DG
4400	2200	300~800	2200	−40~−100	<22.2	<14.3	OD131	BCD120	M,PG
4400	2200	300~800	2200	−40~−100	<22.2	<14.3	OD131	BCD120	M,PG

REMARKS : S—Single Stage Post Acceleration
M—Multi Stage Post Acceleration
H—Helical Post Acceleration
DG—Double Gun
QG—Quadruple Gun
PG—Penta Gun

25SJ201

顯像管

黑白顯像管 BLACK AND WHITE PICTURE TUBES

屏幕尺寸 Screen Size (cm)	型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	聚焦／偏轉方式 Focusing/ Deflection	偏轉角（度） Deflection Angle (deg.)	有效工作面 Useful Screen (mm)	加強方式 Reinforcement Method
4	4S X 101B	35 X 27	117±3	12.8±0.5	電磁／電磁 EM/EM	36	28 X 20	無 None
6	B3040	51.3 X 41.1	140±3	12.8±0.5	靜電／電磁 ES/EM	40	42.4 X 32.2	無 None
13	B3030	103.9 X 80.4	135±3	12.8±0.5	靜電／電磁 ES/EM	90	94.2 X 70.7	無 None
	B3060	103.9 X 80.4	135±3	$20^{+0.9}_{-0.6}$	靜電／電磁 ES/EM	90	94.2 X 70.7	無 None
14	14S X 3Y4	120.3 X 95.5	179±3	$20^{+0.9}_{-0.6}$	靜電／電磁 ES/EM	70	109.9 X 84.9	無 None
	B3021	120.3 X 95.5	220±3	$20^{+0.9}_{-0.6}$	靜電／電磁 ES/EM	55	109.9 X 84.9	無 None
	B3022	120.3 X 95.5	172±3	$20^{+0.9}_{-0.6}$	靜電／電磁 ES/EM	70	109.9 X 84.9	無 None
31	31S X 3B	276 X 224	275±5	$20^{+0.9}_{-0.6}$	靜電／電磁 ES/EM	90	273.3 X 193.3	帶式 Band
44	44S X 1B	375 X 300	351±3	$20^{+0.9}_{-0.6}$	靜電／電磁 ES/EM	90	346 X 270	帶式 Band

注：M—監視器
TV—電視機
V—尋像器

4SX101

B3030

	熱絲額定值 Heater Rating		典型工作條件 Typical Operating Conditions					外形圖	管基接綫圖	備 注
	電 壓 Voltage (V)	電 流 Current (A)	第四陽極電壓 4th Anode Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)	Outine Drawing	Base Connection Diagram	Remarks
	0.7	0.29				3000	−15～−55	OD201	BCD201	M,V,TV
	6	0.075	6000	0～300	6000	300	20～45	OD202	BCD202	M V,TV
	6	0.075	6500	0～300	6500	300	25～45	OD203	BCD202	TV,M
	12	0.075	8000	0～400	8000	300	20～45	OD204	BCD203	TV,M
	12	0.075	8000	0～300	8000	100	20～45	OD205	BCD203	TV,M
	12	0.075	8000	0～300	8000	100	20～45	OD206	BCD203	TV,M
	12	0.075	8000	0～300	8000	100	20～45	OD207	BCD203	TV,M
	12	0.095	12000	0～400	12000	120	35～60	OD208	BCD203	TV,M
	12	0.075	13000	0～400	13000	100	35～55	OD209	BCD203	TV,M

REMARKS: M—Monitor
TV—TV set
V—View Finder

B3021

44SX1

顯示（監視）管 DISPLAY (MONITOR) TUBES

屏幕尺寸 Screen Size (cm)	型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	屏幕曲率半徑 Faceplate Curvature Radius (mm)	聚焦／偏轉方式 Focusing/ Deflection Methode	偏轉角(度) Deflection Angle (deg.)	有效工作面 Useful Screen (mm)	熒光屏 Screen		
									發光顏色 Fluorescence	余輝顏色 Phosphores-cence	余輝 Persistence
10	10SG1B	86 X 70	167±3	$20^{+0.9}_{-0.6}$	平面 Flat	靜電／電磁 ES/EM	55	74 X 56	白 White	白 White	中短 Medium Short
14	B1050	104 X 104	268±2	28.6±0.5	平面 Flat	靜電／電磁 ES/EM	70	90 X 90	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short
15	B1090	120.3X95.5	179±3	$20^{+0.9}_{-0.6}$	800	靜電／電磁 ES/EM	70	109.9 X 84.9	白 White	白 White	中短 Medium Short
16	B1051	121 X 121	268±2	28.6±0.5	平面 Flat	靜電／電磁 ES/EM	70	105 X 105	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short
20	B1080	158.7X1295	185±5	$20^{+0.9}_{-0.6}$	2000	靜電／電磁 ES/EM	90	145 X 115.5	白 White	白 White	中短 Medium Short
23	B1070	200 X 156	205±5	$20^{+0.9}_{-0.6}$	686	靜電／電磁 ES/EM	90	183.5 X 140.8	白 White	白 White	中短 Medium Short
31	31SG20Y14	275 X 224	275±5	$20^{+0.9}_{-0.6}$	510	靜電／電磁 ES/EM	90	254.1 X 201.7	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short

注：D—數據顯示
M—監視器
V—尋像器

10SG1

B1090

	熱絲額定值 Heater Rating		典型工作條件 Typical Operating Conditions					綫 寬	外形圖	管基接綫圖	備 注
	電 壓 Voltage (V)	電 流 Current (A)	第四陽極電壓 4th Anode Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)	Line Width (mm)	Outine Drawing	Base Connection Diagram	Remarks
	12	0.085	8000	0~400	8000	400	35~65	0.25 (Ib=20μA)	OD301	BCD203	M,V
	6.3	0.3	20000	−500~0	20000	600	36~80	0.18 (Ib=200μA)	OD302	BCD301	D
	12	0.075	8000	0~400	8000	400	33~73	0.20 (Ib=25μA)	OD303	BCD203	D,M
	6.3	0.3	20000	−500~0	20000	600	36~80	0.18 (Ib=200μA)	OD304	BCD301	D
	12	0.075	9000	0~400	9000	400	33~73	0.23 (Ib=45μA)	OD305	BCD203	D,M
	12	0.075	9000	0~400	9000	400	33~73	0.23 (Ib=45μA)	OD306	BCD203	D,M
	12	0.075	12000	0~600	12000	450	33~77	0.35 (Ib=40μA)	OD307	BCD203	D

REMARKS: D—Data Display
M—Monitor
V—View Finder

B1080

31SG20

顯示管

雷達指示管 RADAR INDICATOR TUBE

屏幕尺寸 Screen Size (cm)	型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	屏幕曲率半徑 Faceplate Curvature Radius (mm)	聚焦／偏轉方式 Focusing/ Deflection Methode	偏轉角（度） Deflec-tion Angle (deg.)	有效工作面 Useful Screen (mm)	熒光屏 Screen		
									發光顏色 Fluorescence	余輝顏色 Phosphores—cence	余輝 Persistence
23	23SX41J	φ230±5	405±12	$35^{+1.5}_{-0.25}$	500	電磁／電磁 EM/EM	53	φ180	黃綠 Yellow Green	黃綠 Yellow Green	中短 Medium Short

23S X 41

	熱絲額定值 Heater Rating		典型工作條件 Typical Operating Conditions					外形圖 Outline Drawing	管基接綫圖 Base Connection Diagram	備注 Remarks
	電壓 Voltage (V)	電流 Current (A)	第四陽極電壓 4th Anode Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)			
	6.3	0.6				8000	−40～−90	OD308	BCD302	雷達顯示 Radar Display

特種管

脈沖形成管 PULSE FORMING TUBES

型號 Type	外徑 Outside Face Diameter (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	熱絲額定值 Heater Rating	
				電壓 Voltage (V)	電流 Current (A)
SMX−1	127±3	433±13	50.5±2.5	6.3	0.6
SMX−2					

高壓穩壓管 HIGH VOLTAGE STABILIIZING TUBE

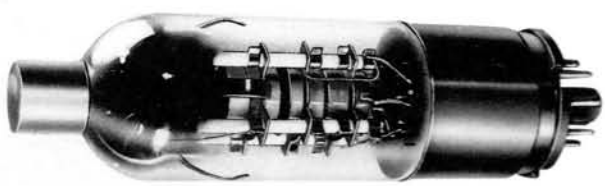
型號 Type	外徑 Outside Face Diameter (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	熱絲額定值 Heater Rating	
				電壓 Voltage (V)	電流 Current (A)
WY−10P	35±0.75	130±3	35±0.75	6.3	0.6

SMX-1

SMX-2

	典型工作條件 Typical Operating Conditions					外形圖 Outline Drawing	管基接綫圖 Base Connection Diagram	備注 Remarks
	收集極電壓 Collector Voltage (V)	第三陽極電壓 3rd Anode Voltage (V)	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	調制極電壓 Modulator Voltage (V)			
	1500	1500	100～400	2300	−10～−100	OD 401	BCD 401	專用設備 For Special Equipment

	典型工作條件 Typical Operating Conditions			外形圖 Outline Drawing	管基接綫圖 Base Connection Diagram	備注 Remarks
	第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	截止電壓 Cutoff Voltage (V)			
	4000	250	−15～−70	OD 402	BCD 402	穩壓裝置 For Stabilized Voltage Equipment

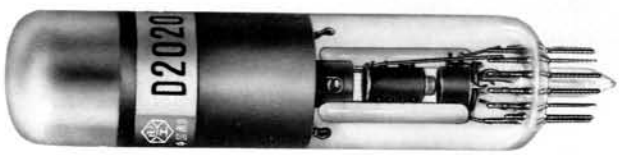


WY-10P

彩色發光管

COLOR LUMINOTRONS

型號 Type	屏幕外形尺寸 Outside Face Dimension (mm)	管長 Overall Length (mm)	管頸直徑 Neck Diameter (mm)	有效工作面 Useful Screen (mm)	熒光屏 Screen			熱絲額定值 Heater Rating	
					發光顏色 Fluorescence	余輝顏色 Phosphores-cence	余輝 Persistence	電壓 Voltage (V)	電流 Current (A)
3ST1R	φ28±0.5	136±1	28±0.5	φ20	紅 Red	紅 Red	中 Medium	5	0.145
3ST1G					綠 Green	綠 Green	中 Medium		
3ST1B					藍 Blue	藍 Blue	中 Medium		
3ST2Y22R	φ35±0.5	158±2	28±0.5	φ27	紅 Red	紅 Red	中 Medium	5	0.145
3ST2Y22G					綠 Green	綠 Green	中 Medium		
3ST2Y22B					藍 Blue	藍 Blue	中 Medium		



3S T 1

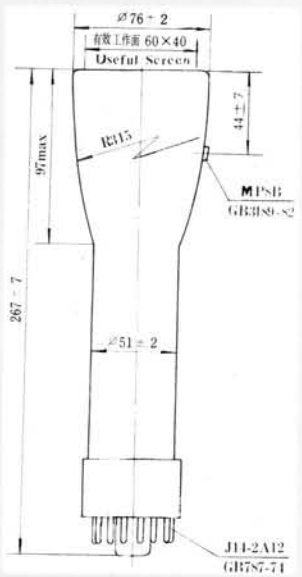
典型工作條件和特性 Typical Operating Conditions and Characteristics					亮度	外形圖	管基接線圖	備注
第二陽極電壓 2nd Anode Voltage (V)	第一陽極電壓 1st Anode Voltage (V)	調制極電壓 Modulator Voltage (V)	陰極電壓 Cathode Voltage (V)	工作束電流 Beam Current (μA)	Luminance (cd/m²)	Outline Drawing	Base Connection Diagram	Remarks
8000	70	0	2～30	175	>3000	OD403	BCD403	巨型彩色顯示裝置和各類顯示牌
					>9000			
					>3000			
10000	70	0	2～26	150	≥3900	OD404	BCD403	For Huge Color Display Installation and Various Display system
					≥9500			
					≥2400			

3ST2

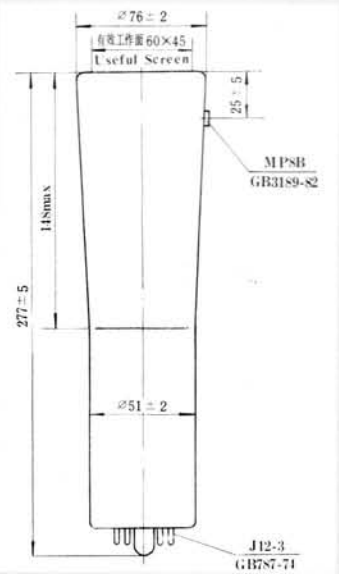
外形圖

OD101

OD102



OD103



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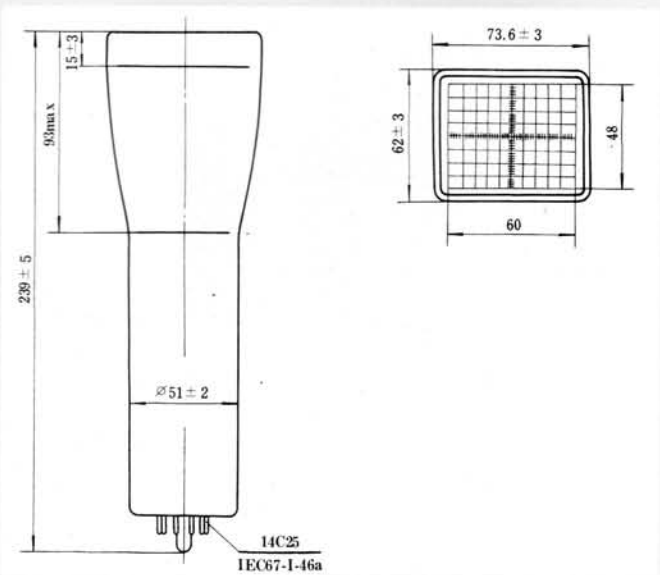

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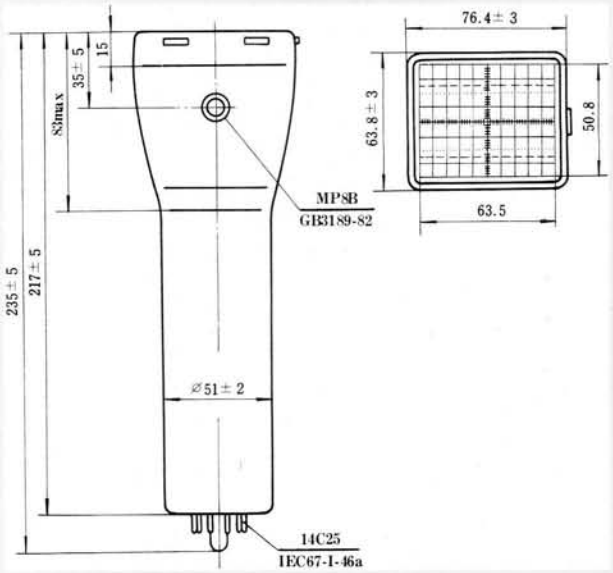

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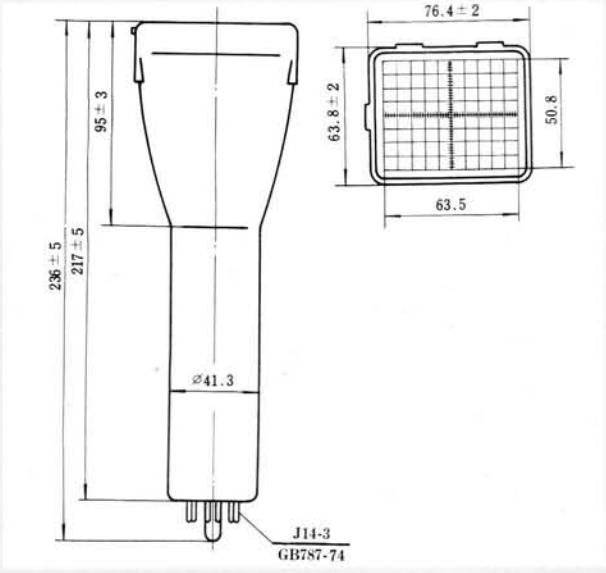
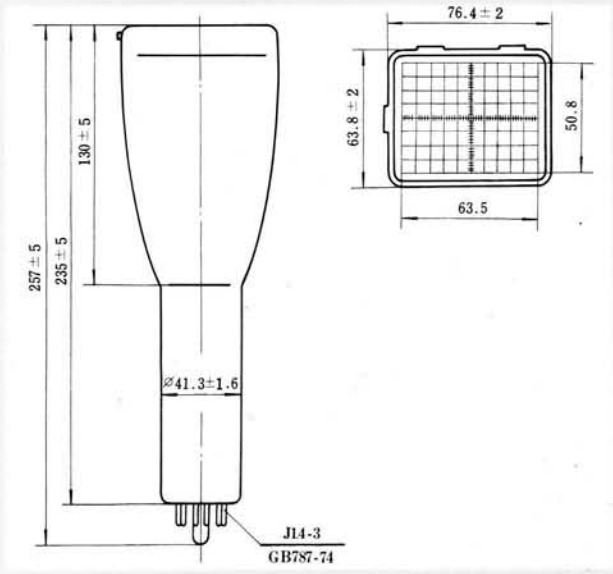


OD107



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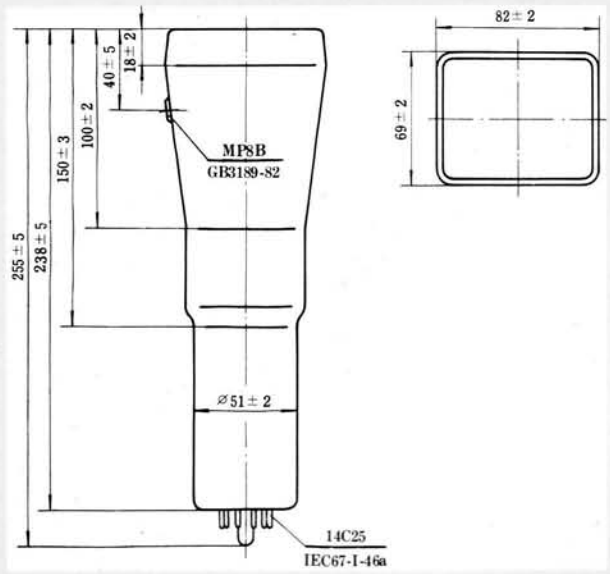
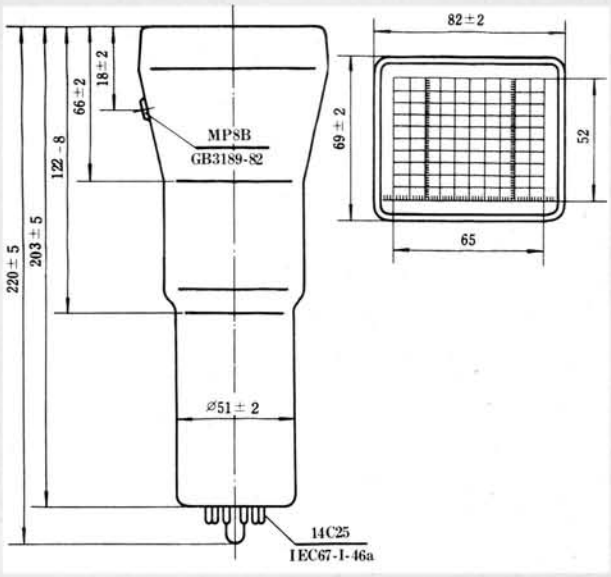
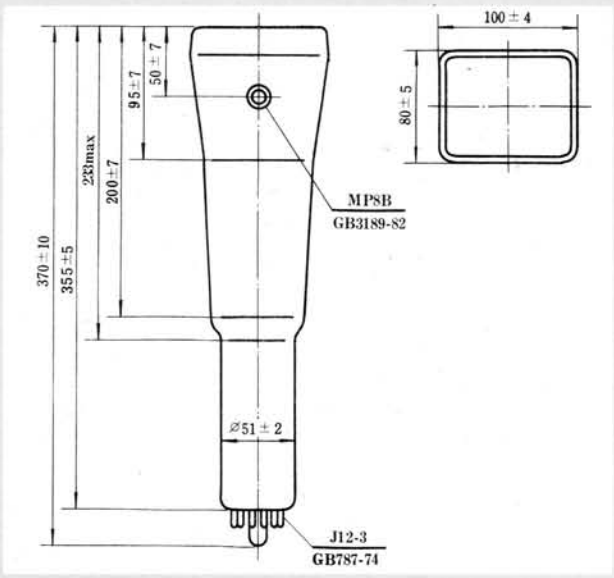


OD109

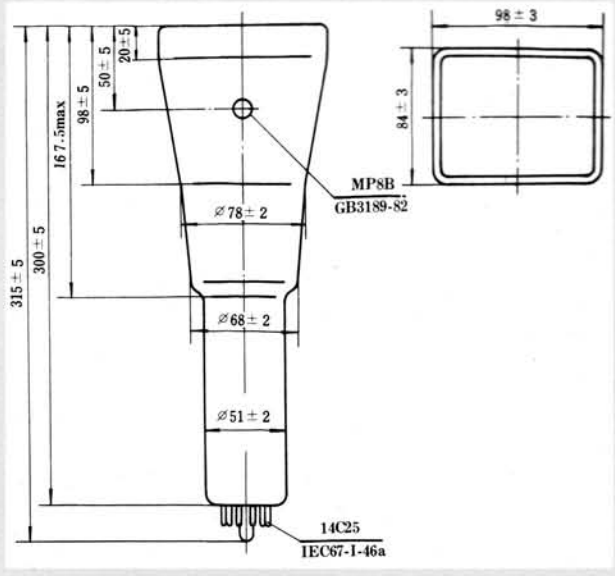
外形圖



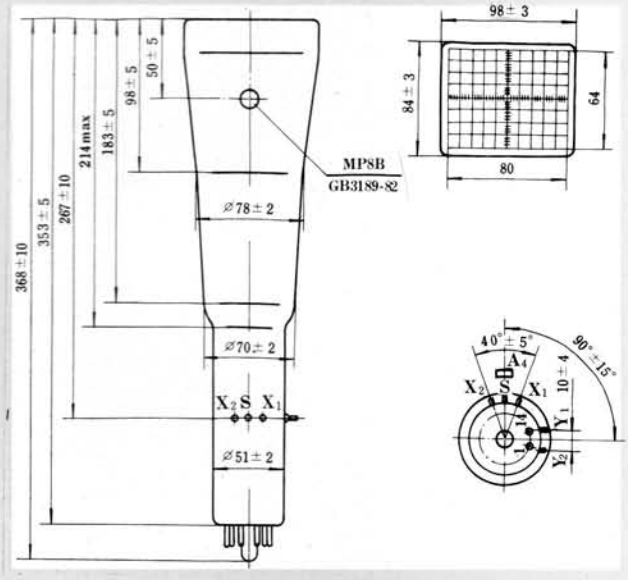
OD110



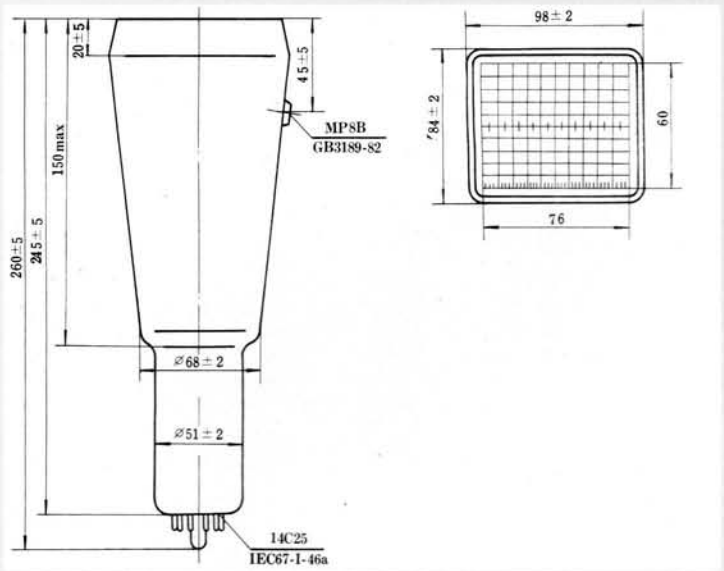
OD111



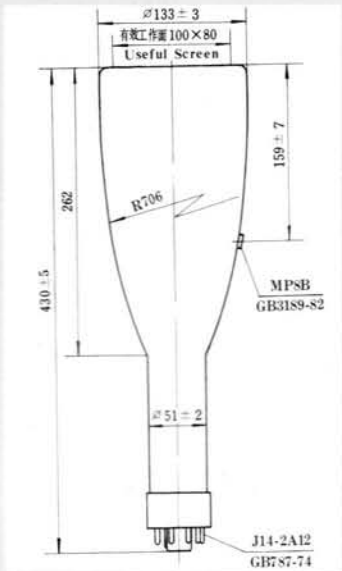
OD112



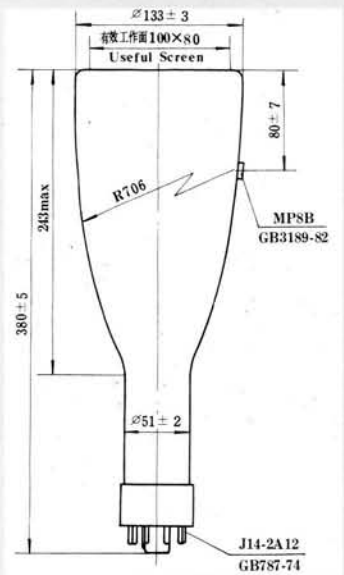
OD113



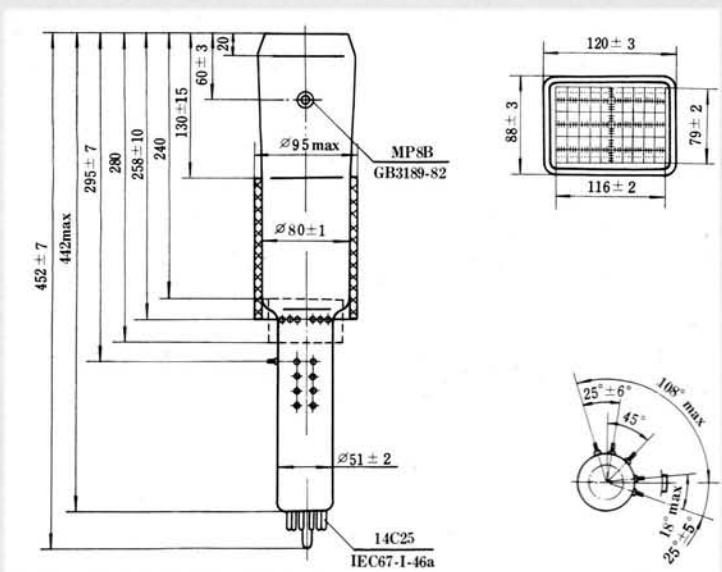
OD114



OD115

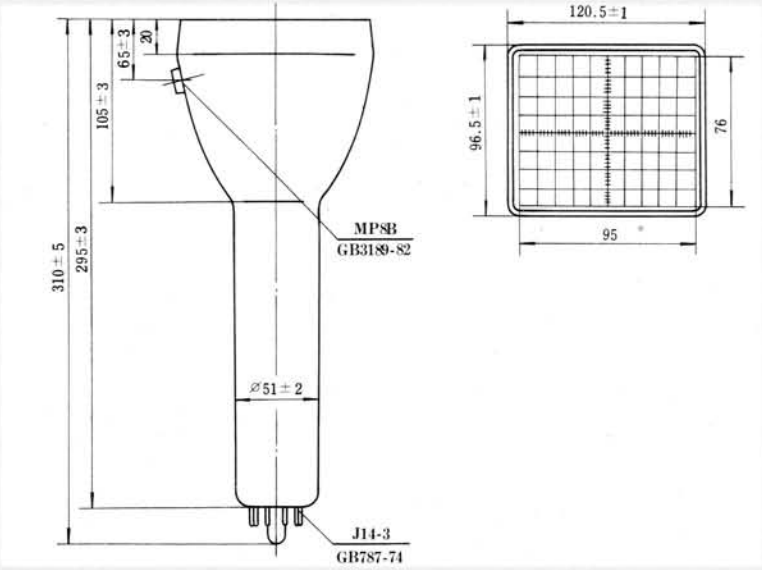


OD116

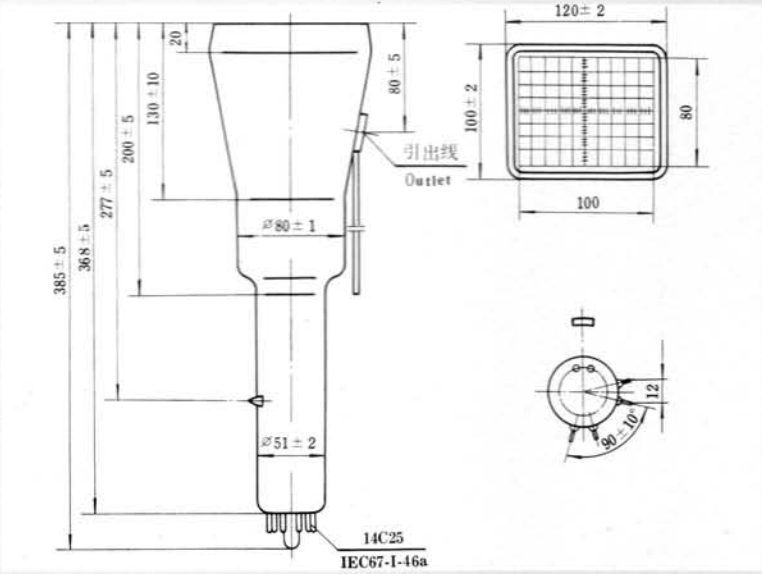


OD117

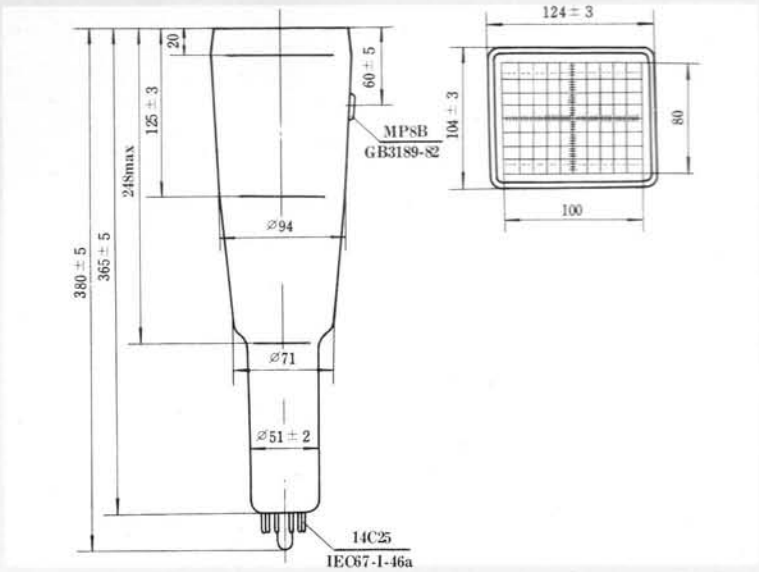
外形圖



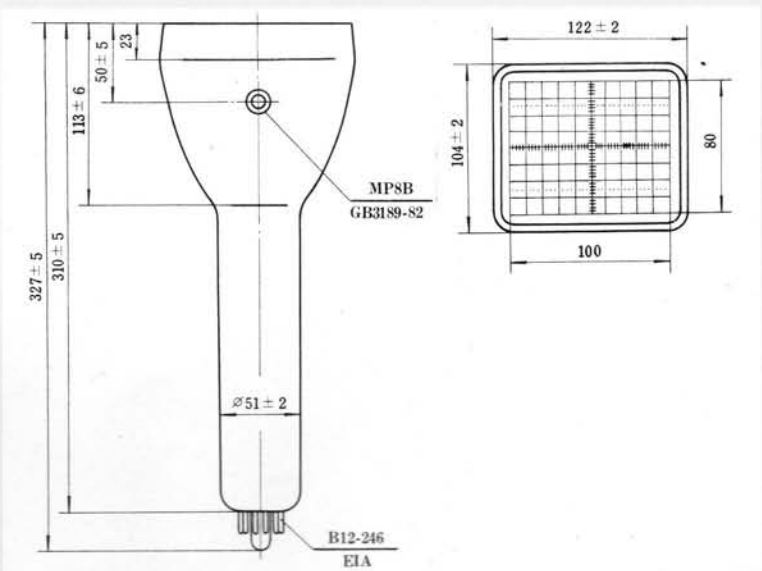
OD118



OD119

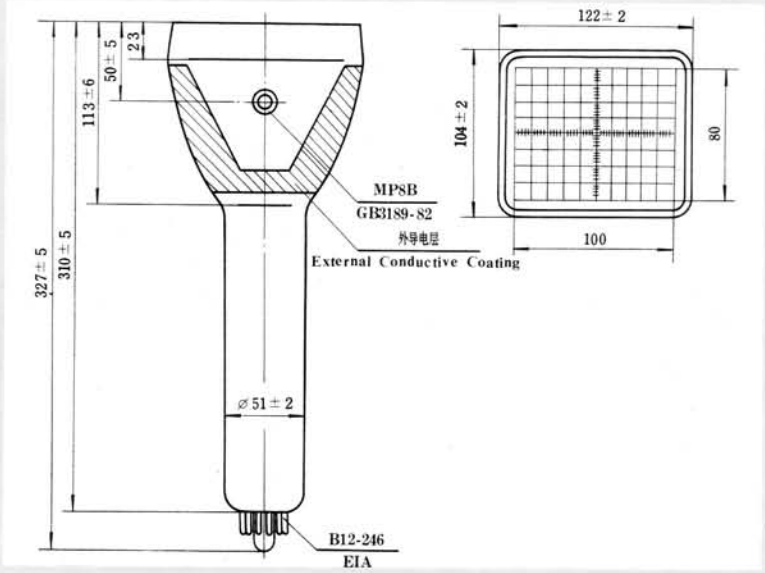

124 ± 3
20
60 ± 5
MP8B
GB3189-82
104 ± 3
80
100
125 ± 3
248max
380 ± 5
365 ± 5
Ø94
Ø71
Ø51 ± 2
14C25
IEC67-I-46a

OD120

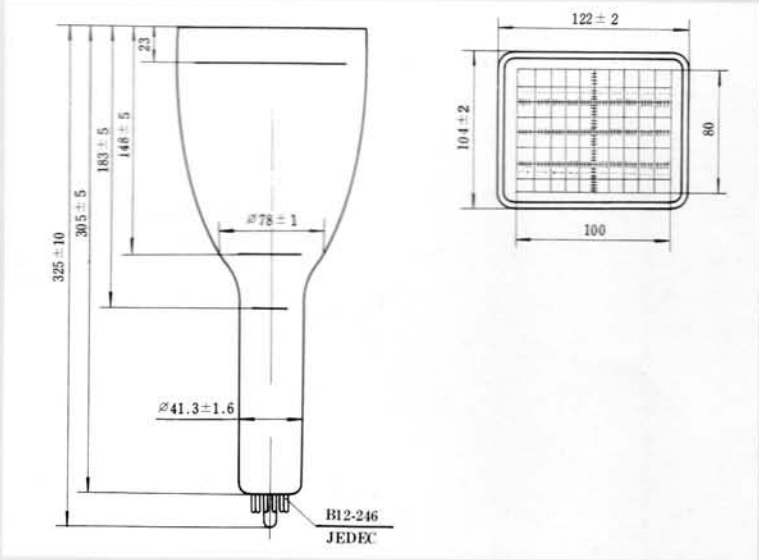

122 ± 2
23
50 ± 5
113 ± 6
MP8B
GB3189-82
104 ± 2
80
100
327 ± 5
310 ± 5
Ø51 ± 2
B12-246
EIA

OD121

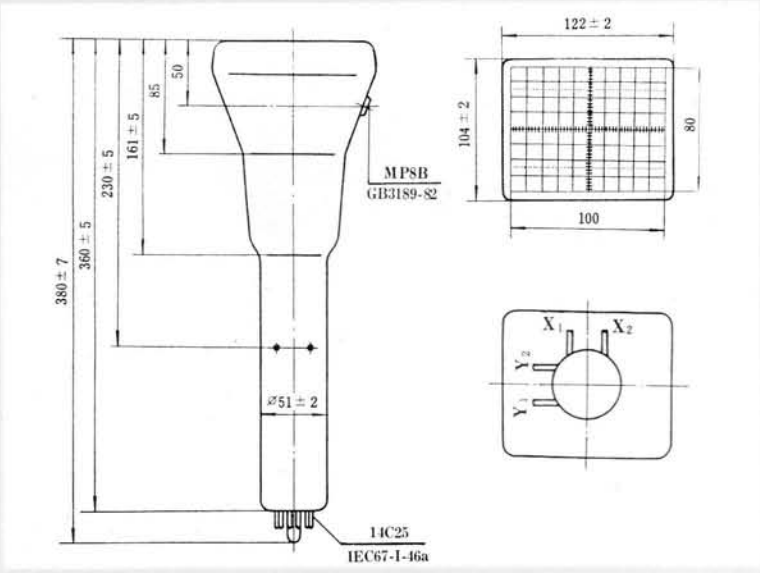
外形圖



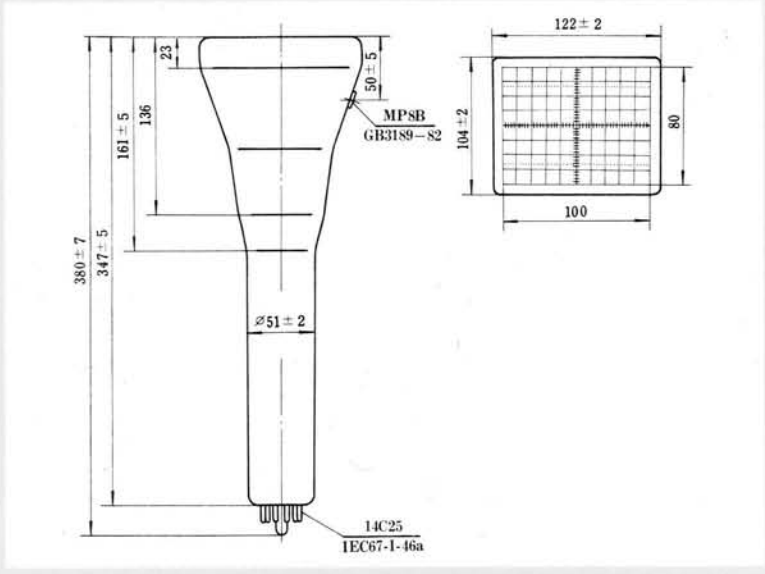
OD122



OD123

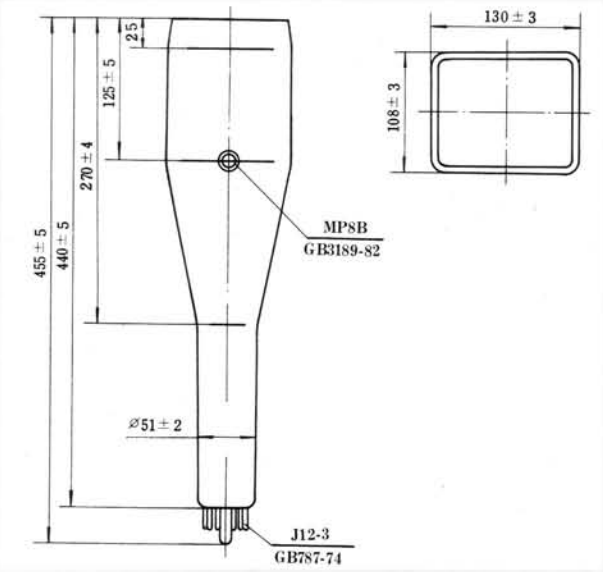

122 ± 2
104 ± 2
80
100
50
85
161 ± 5
230 ± 5
360 ± 5
380 ± 7
MP8B
GB3189-82
⌀51 ± 2
14C25
IEC67-I-46a
X1
X2
Y2
Y1

OD124

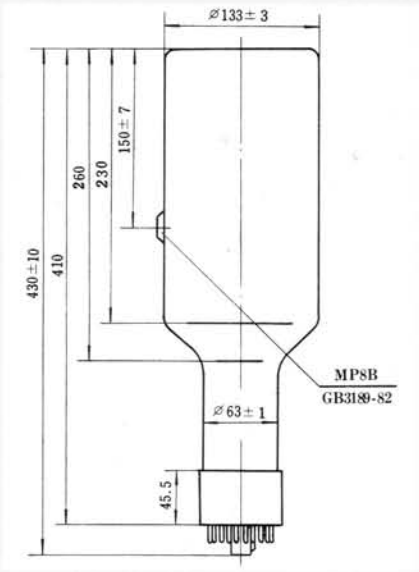

122 ± 2
104 ± 2
80
100
23
50 ± 5
136
161 ± 5
347 ± 5
380 ± 7
MP8B
GB3189-82
⌀51 ± 2
14C25
IEC67-I-46a

OD125

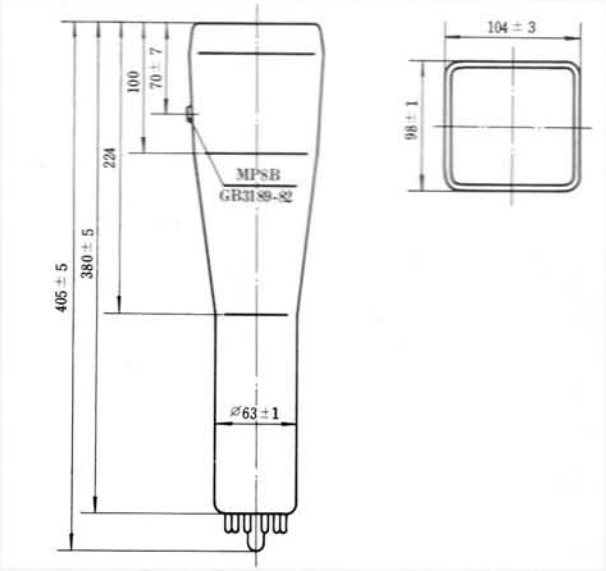
外形圖



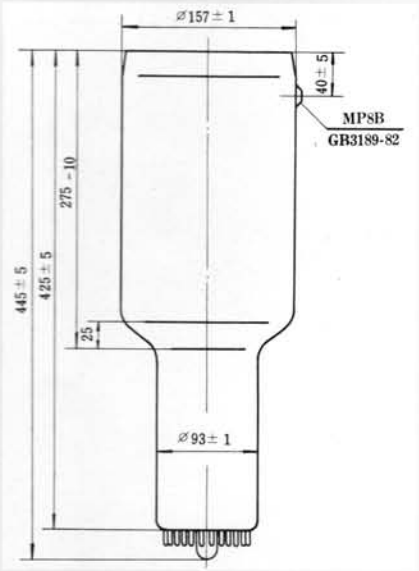
OD126



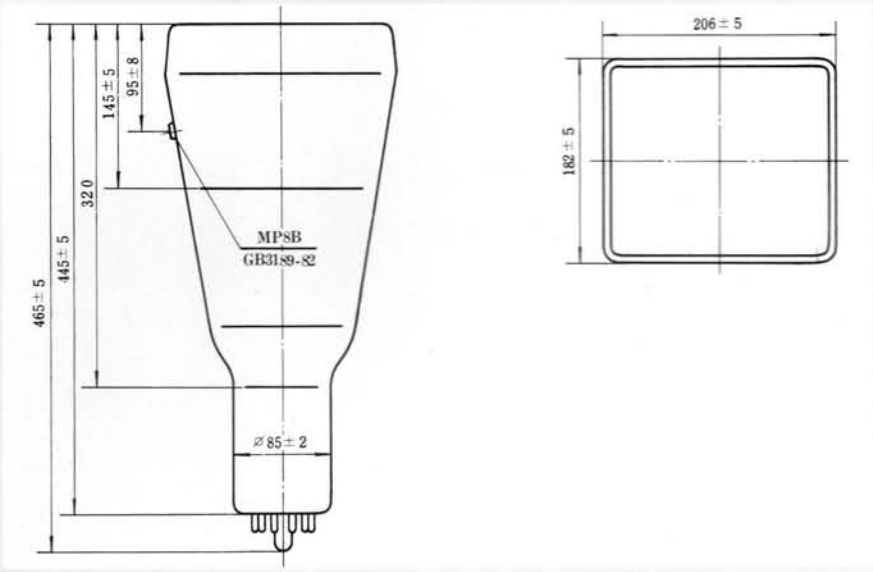
OD127



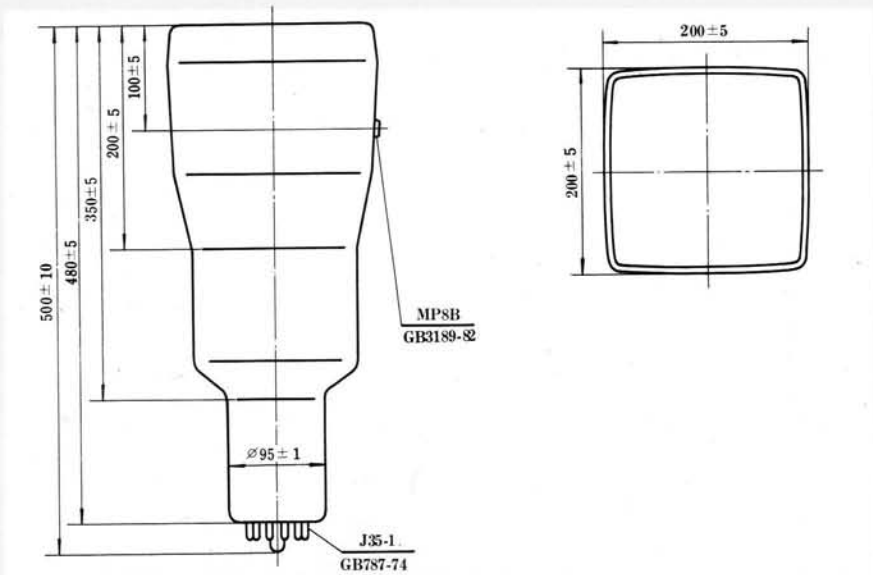
OD128



OD129

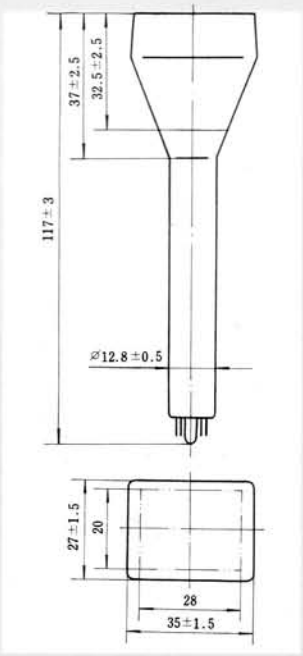

206±5
182±5
145±5
95±8
320
465±5
445±5
MP8B
GB3189-82
⌀85±2

OD130

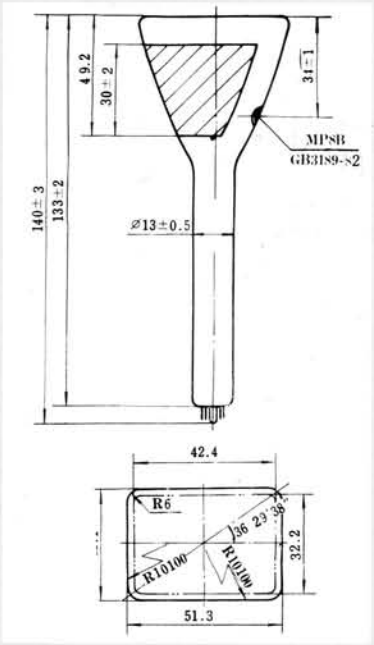

200±5
200±5
100±5
200±5
350±5
480±5
500±10
MP8B
GB3189-82
⌀95±1
J35-1
GB787-74

OD131

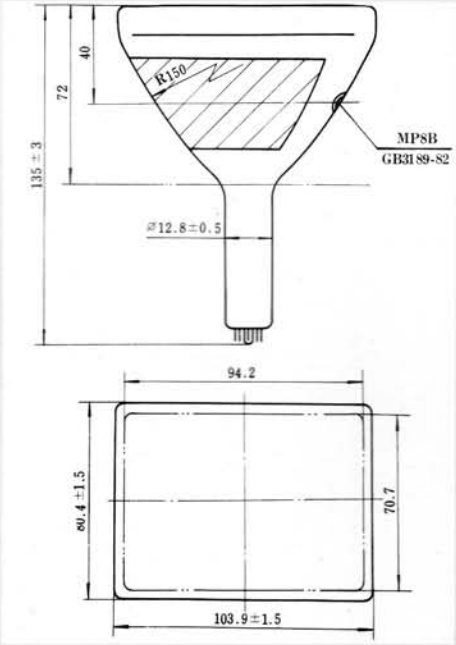
外形圖



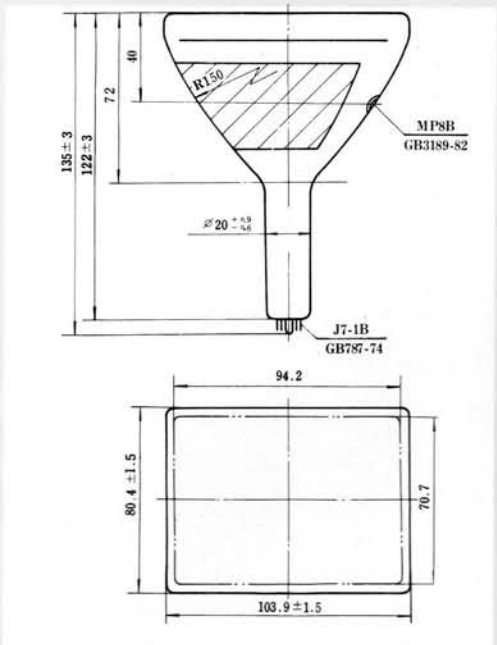
OD201



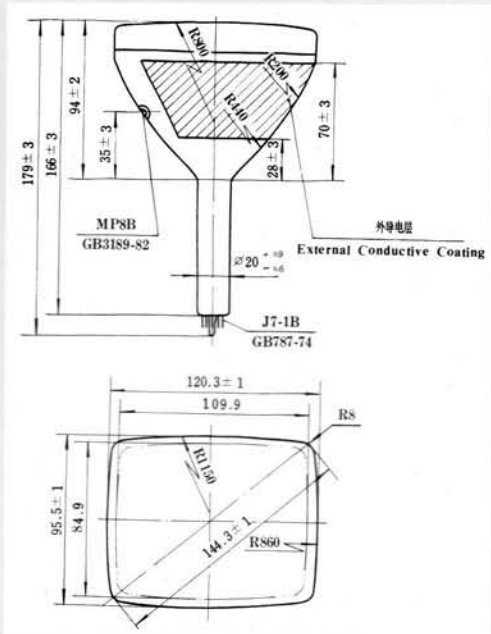
OD202



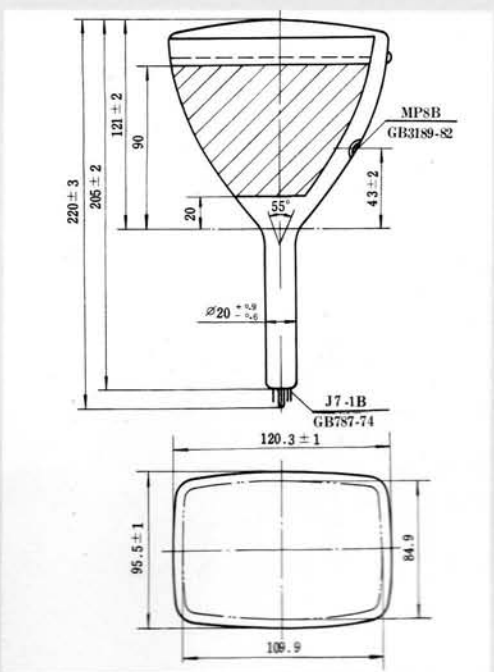
OD203



OD204

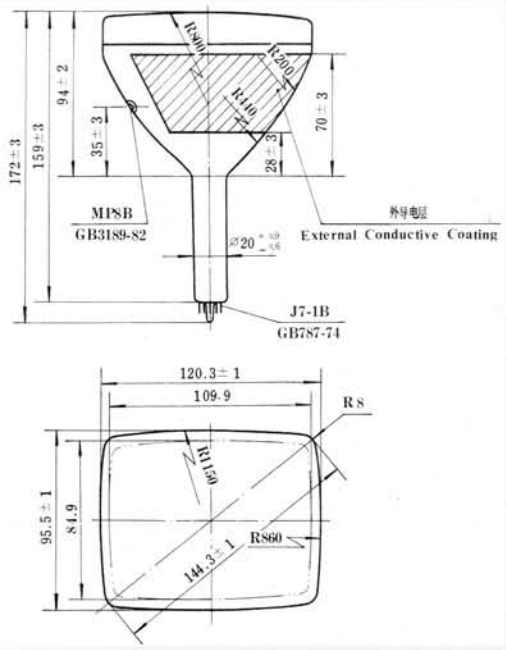


OD205

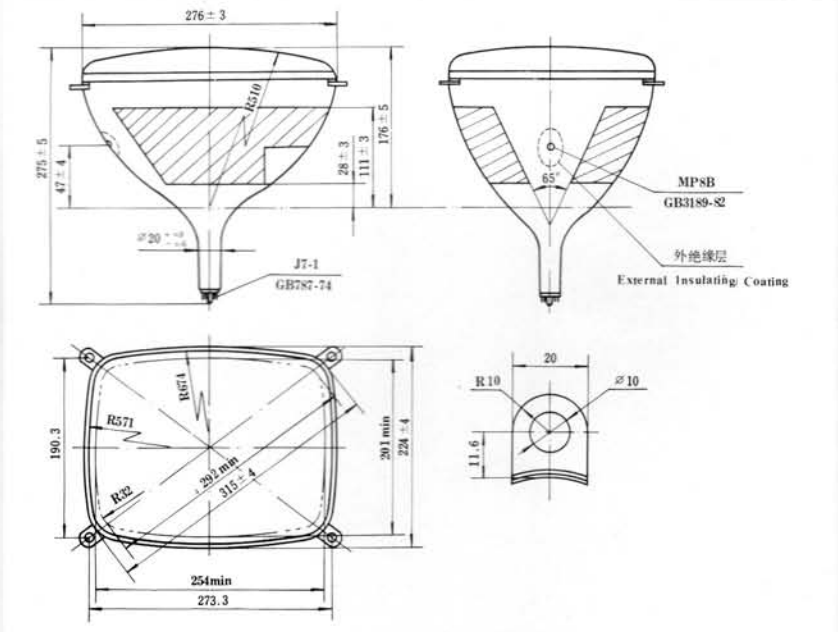


OD206

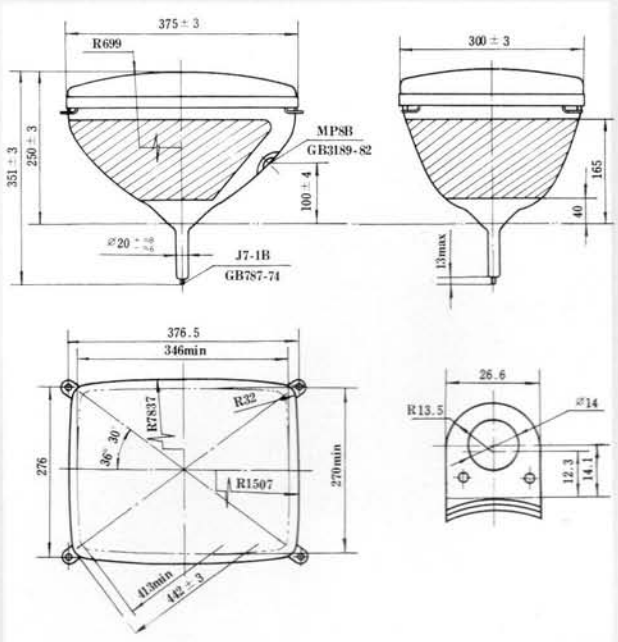
外形圖



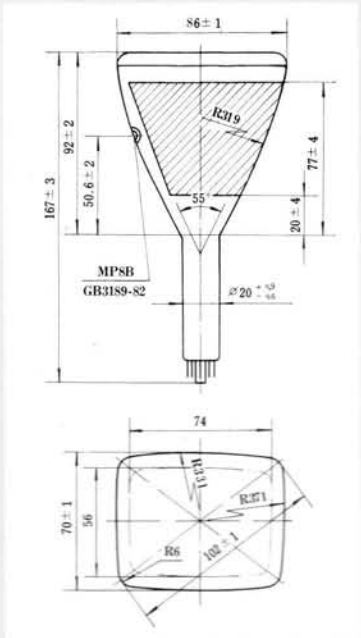
OD207



OD208

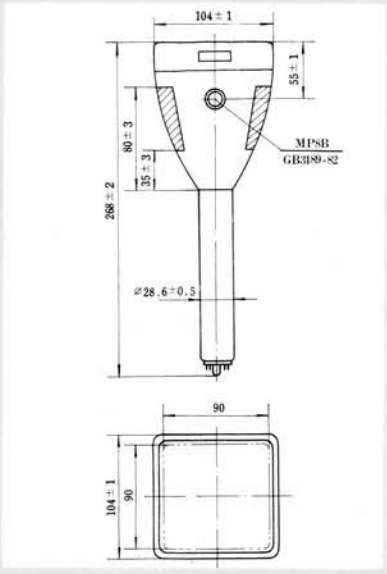

375±3
R699
300±3
MPSB
GB3189-82
351±3
250±3
100±4
165
40
J7-1B
GB787-74
13max
376.5
346min
R32
R7837
36°30'
276
R1507
270min
413min
442±3
26.6
R13.5
Ø14
12.3
14.1

OD209

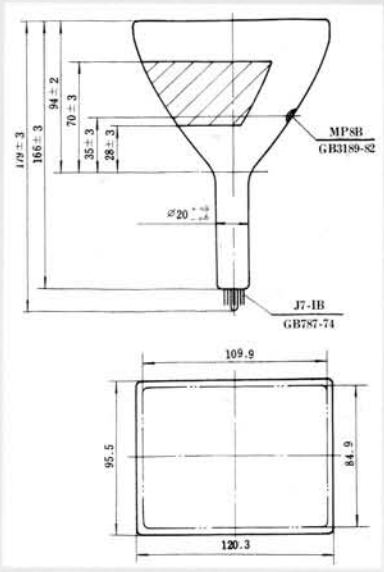

86±1
R319
92±2
167±3
50.6±2
77±4
55°
20±4
MPSB
GB3189-82
74
70±1
56
R371
R6
102±1

OD301

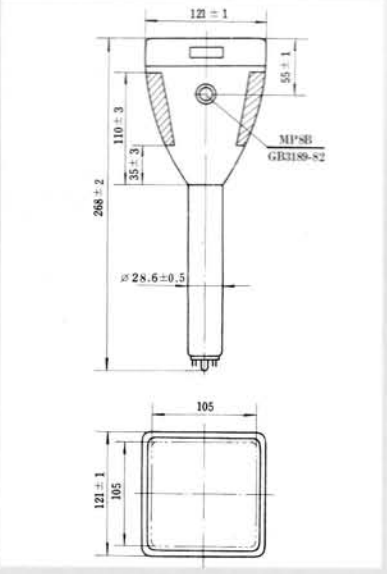
外形圖



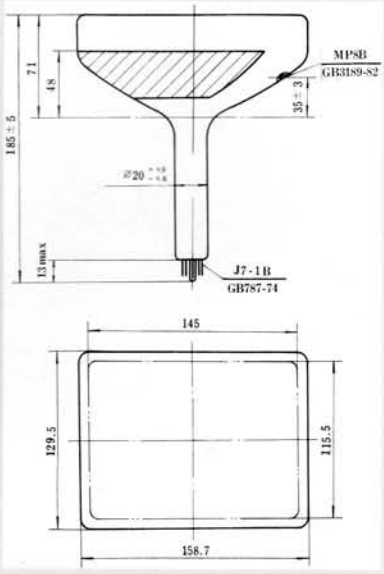
OD302



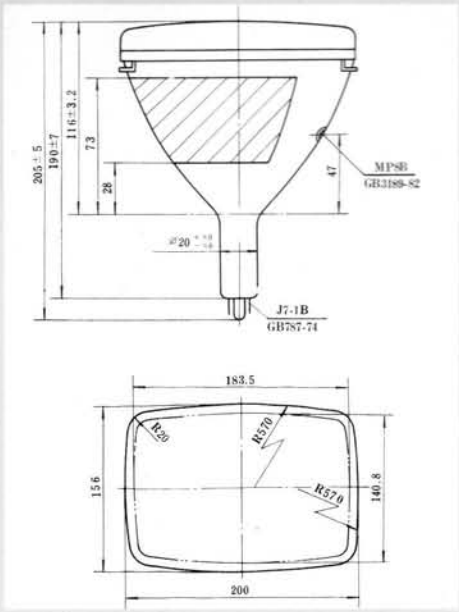
OD303



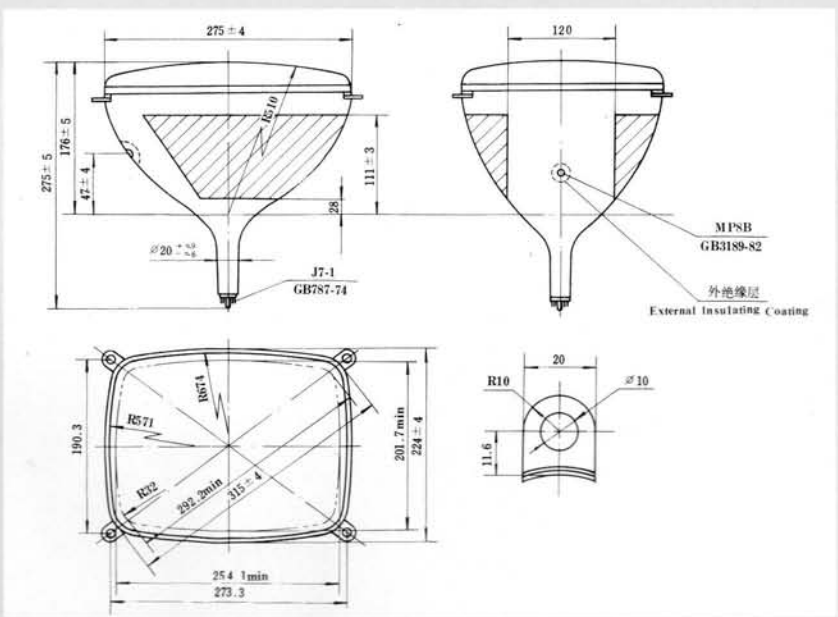
OD304



OD305

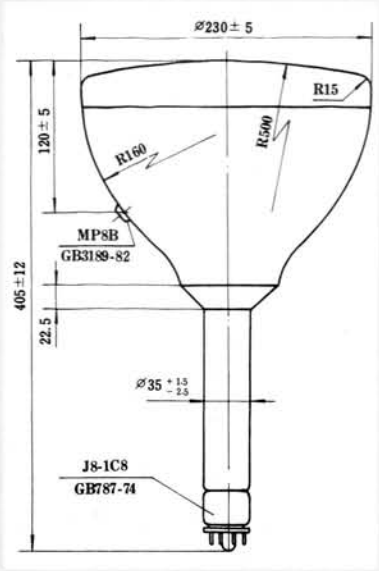

205±5
190±7
116±3.2
73
28
47
MPSB
GB3189-82
J7-1B
GB787-74
183.5
R20
R570
R570
156
140.8
200

OD306

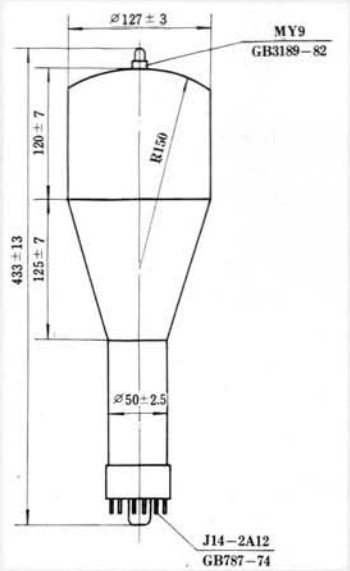

275±4
120
275±5
176±5
47±4
R510
111±3
28
J7-1
GB787-74
MPSB
GB3189-82
外绝缘层
External Insulating Coating
R574
R571
R32
190.3
292.2min
315±4
201.7min
224±4
254.1min
273.3
20
R10
ø10
11.6

OD307

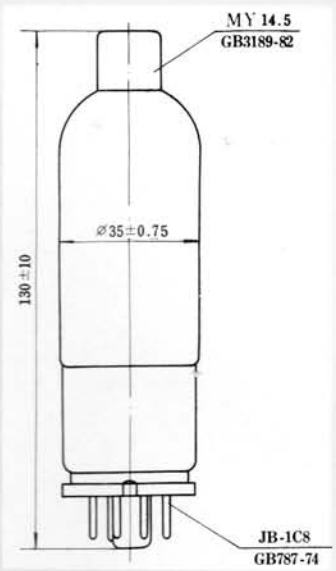
外形圖 OUTLINE DRAWINGS



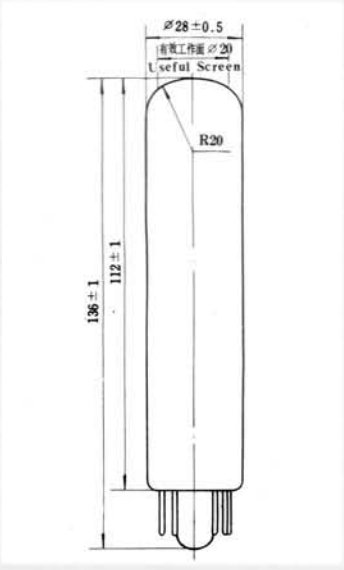
OD308



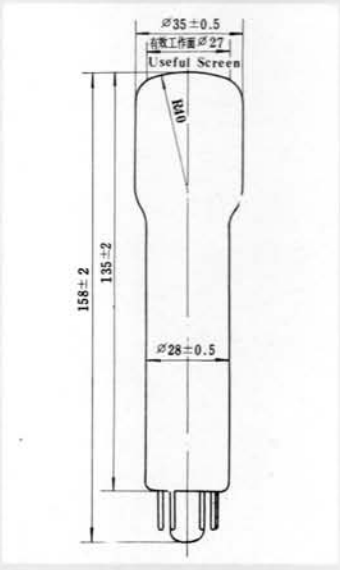
OD401



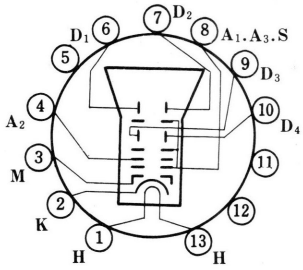
OD402



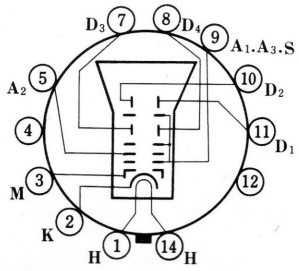
OD403



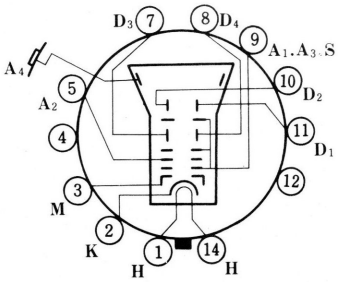
OD404



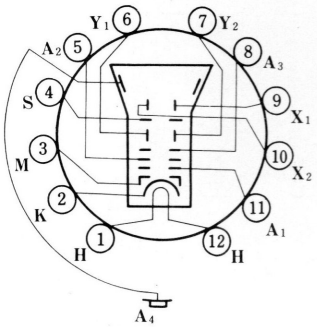
BCD101



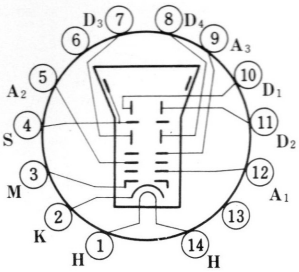
BCD102-1



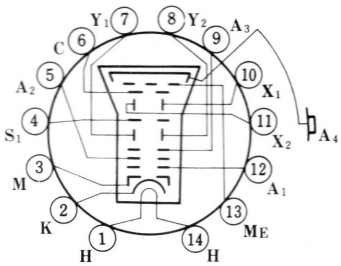
BCD102-2



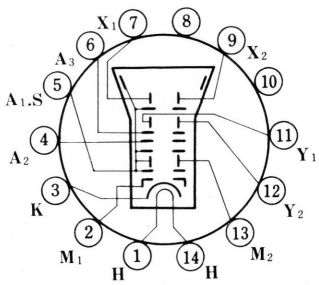
BCD103



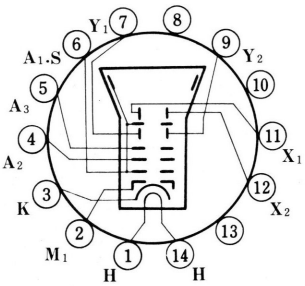
BCD104



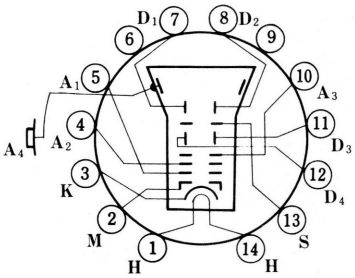
BCD105



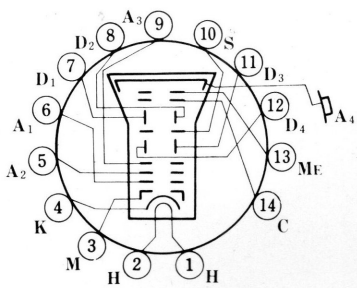
BCD106



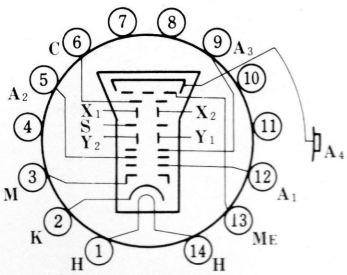
BCD107



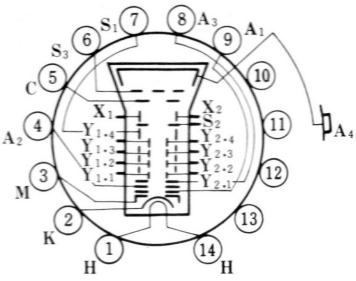
BCD108



BCD109

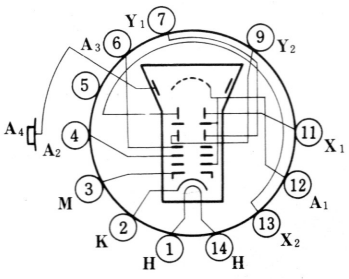


BCD110

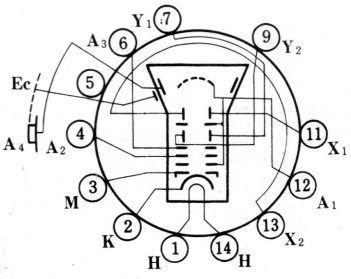


BCD111

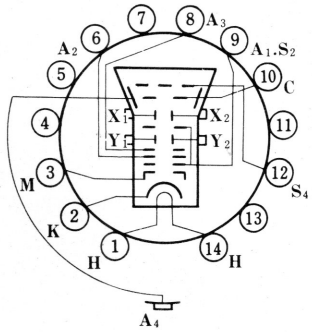
管基接綫圖



BCD112-1



BCD112-2



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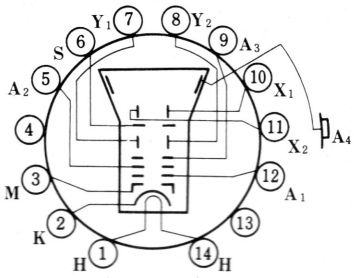

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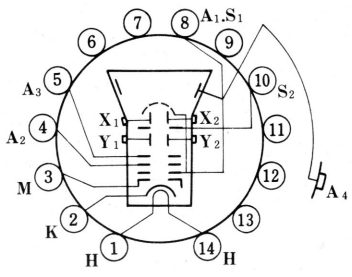

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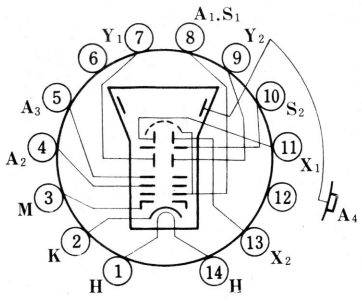

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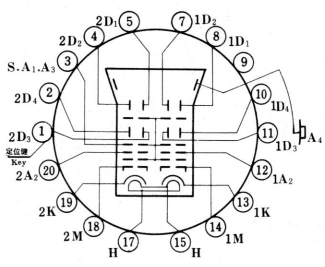

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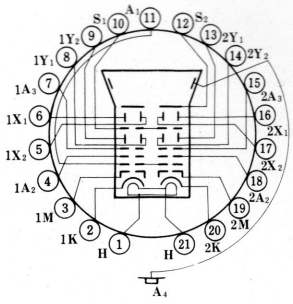

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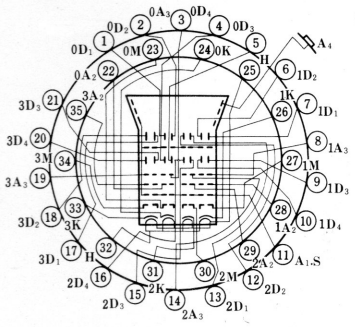

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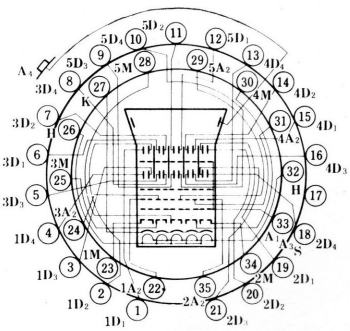

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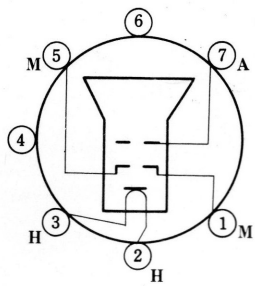

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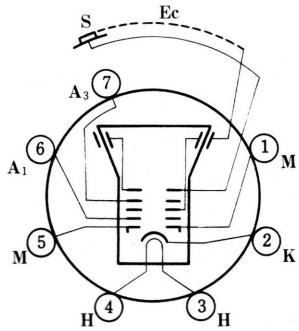

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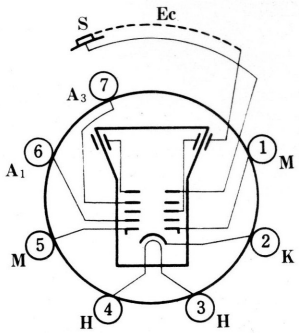

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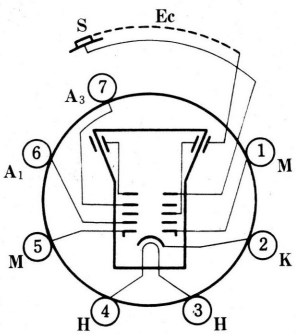

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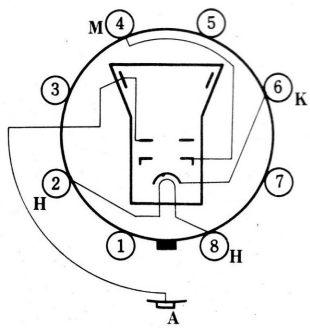

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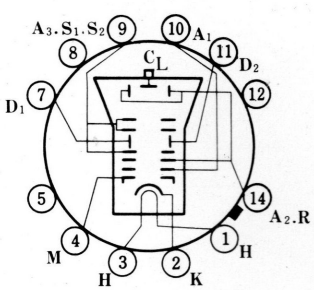

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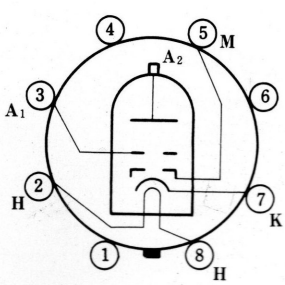

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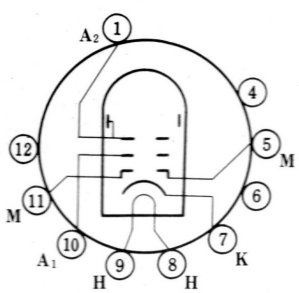


BCD403

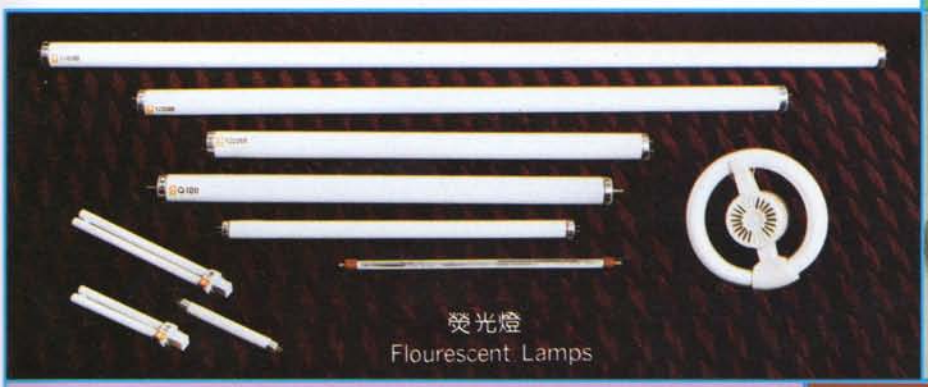
型號對照表 REPLACEMENT GUIDE

中國型號 China Type	國外型號 Type to be Replaced
8SJ31A	8Л029A
8SJ31D	8Л029B
8SJ31J	8Л029И,3BP1A
8SJ40A	8Л039A
8SJ40D	8Л039B
8SJ40J	8Л039И,3RP7A
13SJ38A	5ABP11
13SJ38D	5ABP7
13SJ38J	5ABP1
9SJ105Y14	95AB31
9SJ106Y14	95DB31
9SJ107Y14	95AB31
12SJ104Y14	D10－170GH/93
13SJ105J	140ACB31A,D13－451/45
15SJ109Y14	D14－302GH/43
15SJ110Y14	D14－180
15SJ114Y14	150FTM31,150BYB31T
15SJ116Y14	150BYB31,150CTB31
15SJ118Y41	150BTB31H
A2180	H6111B－P31,T4655,150CDB31
A2181	150CDB31
31SX3B	310GNB4, 310GAB4
44SX1B	440BFB4(Q)
B3021	140BTB4,5FNS4
B3030	4ADC4,R50AP4
B3040	C205P4
SMX－1	Иф－17
SMX－2	Иф－17
B1070	E2733
B1080	E2871B4
B1090	E2808
23SX41J	23ЛК41И
3ST1R	LS_1D
3ST1G	LS_1D
3ST1B	LS_1D
3ST2Y22R	SLS_1D
3ST2Y22G	SLS_1D
3ST2Y22B	SLS_1D

主要產品

MAIN PRODUCTS

攝像管
Camera Tubes



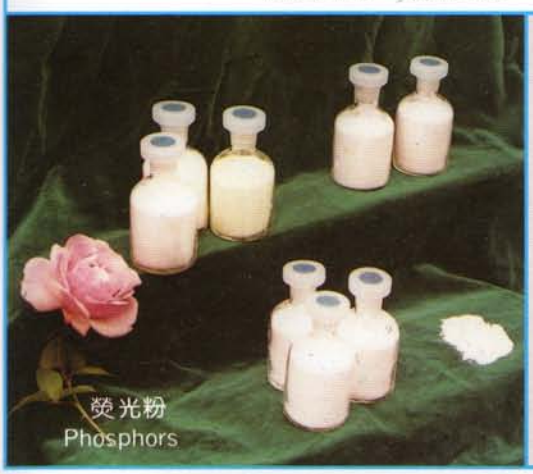
熒光燈
Flourescent Lamps

飛機着陸燈
Airplane Landing Lamps

應用整機
Electronic Appliances

光電倍增管
PMT Products

核輻射計數管
Nuclear Radiation Counter Tubes



熒光粉
Phosphors

吸氣劑
Getters

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