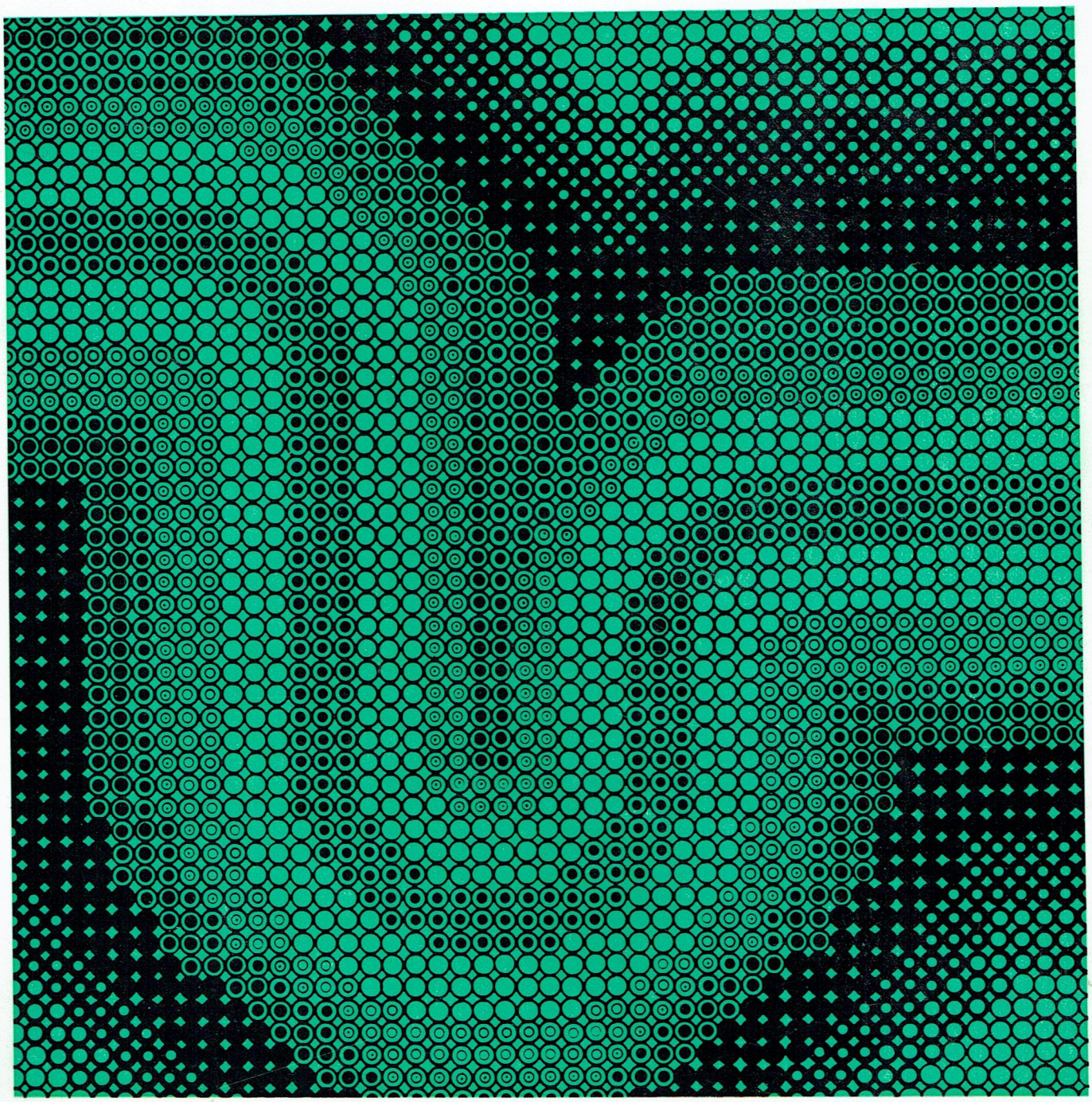
OSCILLOSCOPE AND MONITOR TUBES '76|77

ORION



TYPE ASSORTMENT

TYPE DESIGNATION SYSTEM

symbol		old	new
first letter	before the group of numbers	D: electrostatic deflection and focus	D: single trace oscilloscope tube M: monitor tube K: under development
second letter		B, F, G, H, L, N, P or W: cf. screen designation system	—
third letter		M: multiple trace tube	—
number preceding hyphen		screen diameter or screen diagonal in cm	
number following hyphen		serial number indicating a particular design or development	
final letters		F: flat faceplate	BE, GH, GJ, GL, GM, GR, LF, LD or W: cf. screen designation system

For eliminating the parallax the oscilloscope and monitor tubes can be provided with internal graticules. These tubes are available on special order. The type designation of tubes with not illuminable graticules must be completed with /01, /03, /05, etc., while those with illuminable graticules with /02, /04, /06 etc., and those with illuminable graticules and with fittings for illumination with /02S, /04S, /06S, etc.

SCREEN DESIGNATION SYSTEM

Code			Screen colour		Persistence
new	old	EIA	fluorescence	phosphorescence	
BE	B	P11	blue	blue	medium short
GH	H	P31	green	green	medium short
GJ	G	P1	yellowish green	yellowish green	medium
GL	N	P2	yellowish green	yellowish green	medium short
GM	P	P7	bluish white	yellowish green	long
GR	—	P39	yellowish green	yellowish green	long
LD	L	P33	orange	orange	very long
LF	F	P19	orange	orange	very long
W	W	P4	white	white	medium

With the rise of the anode voltage the screen P22R/P31 changes its colour steadily from red to yellowish green.

Persistence is defined as the period of time during which brightness dimishes to 1/10 of its initial value.

Persistence	JEDEC description
less than 1 μs	very short
1 μs ... 10 μs	short
10 μs ... 1 ms	medium short
1 ms...100 ms	medium
100 ms... 1 s	long
over 1 s	very long

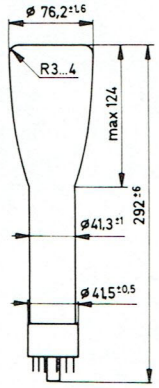
SYMBOLS AND DESIGNATION OF ELECTRODES AND ELECTRODE CONNECTIONS

A	side connection according to JEDEC J1-22
$a_1 \ldots a_4$	anodes 1...4
b	metal rimband
B	side connection according to JEDEC J1-21
D_1 and D_2	horizontal deflection plates
D_3 and D_4	vertical deflection plates
d_{12}	horizontal deflection factor
d_{34}	vertical deflection factor
f	heater
$g_1 \ldots g_4$	grids 1...4
I_f	heater current
i. c.	internal connection; base connection should not be used as tie point for components
k	cathode
m	external conductive coating
t_h	heating time
U_a	anode voltage
$U_{a1} \ldots U_{a4}$	voltage of anodes 1...4
U_f	heater voltage
$U_{g1} \ldots U_{g4}$	DC voltage between grids 1...4 and cathode
$-U_{g1\ cut\ off}$	negative grid bias for the visual extinction of the undeflected focused spot (at oscilloscope tubes) and of the raster (at monitor tubes)
U_k	voltage between grid 1 and cathode at cathode control

All voltages refer to cathode unless otherwise stated.

In double trace oscilloscope tubes with equal systems the equivalent electrodes are distinguished by subscripts a and b.

with flat faceplate, for medium operating voltages



Application

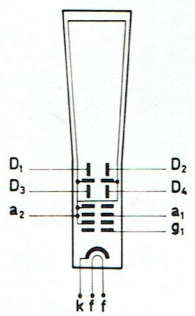
in small size portable oscilloscopes for medical and industrial purposes

Screen Types

DB 7-113 F
DG 7-113 F
DN 7-113 F
DP 7-113 F

System Structure

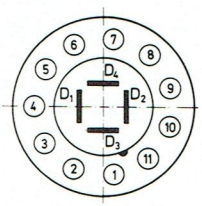
Arrangement of Electrodes:



Base Connections

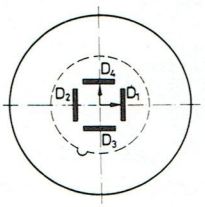
(bottom view)

1 — f
2 — g_1
3 — k
4 — a_1
5 — D_3
6 — D_4
7 — a_2
8 — D_2
9 — D_1
10 — i. c.
11 — f



Deflection

(viewed from screen end)



Deflection Method: electrostatic, symmetrical

Focusing Method: electrostatic

Base

Medium-Shell Magnal, 11-pin, JETEC No. B11-66

Minimum Useful Screen Diameter 70 mm

Heating

U_f = 6.3 V
I_f = 600 mA

Typical Operation

U_{a2}	=	2 kV
U_{a1}	=	320...600 V
$-U_{g1\ cut\ off}$	=	45...90 V
d_{12}	=	39.4...53.5 V/cm
d_{34}	=	30...41 V/cm

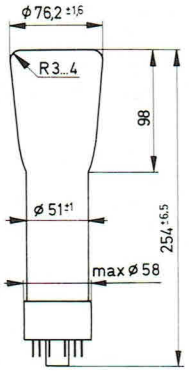
Maximum Ratings

U_{a2} = 2.5 kV
U_{a1} = 1 kV

Accessories

Socket: VST 5
Metallic Shield: ART 1

with flat faceplate, for medium operating voltages



Application

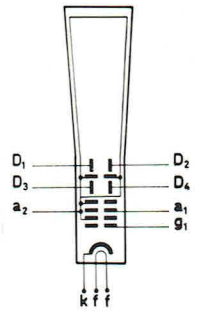
in small size portable oscilloscopes for medical and industrial purposes

Screen Types

DB 7-115 F
DG 7-115 F
DN 7-115 F

System Structure

Arrangement of Electrodes:



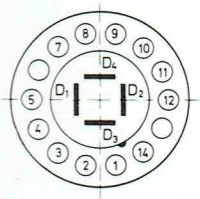
Deflection Method: electrostatic, symmetrical

Focusing Method: electrostatic

Base Connections

(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — D_3
8 — D_4
9 — a_2
10 — D_2
11 — D_1
12 — i. c.
14 — f

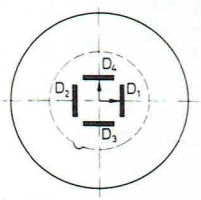


Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Deflection

(viewed from screen end)



Minimum Useful Screen Diameter 70 mm

Heating

U_f = 6.3 V
I_f = 600 mA

Maximum Ratings

U_{a2} = 2.2 kV
U_{a1} = 1.1 kV

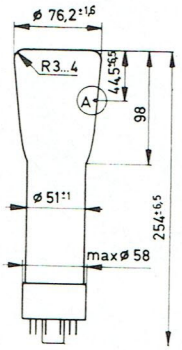
Typical Operation

U_{a2}	=	2 kV
U_{a1}	=	320...720 V
$-U_{g1\ cut\ off}$	=	30...90 V
d_{12}	=	75 V/cm
d_{34}	=	59 V/cm

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART 6

with flat faceplate, post-deflection accelerator, for medium operating voltages



Application

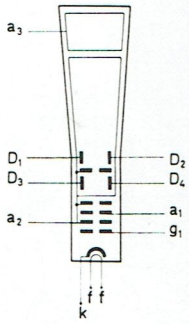
in small size portable oscilloscopes for medical and industrial purposes, most suitable for small oscillosynchroscopes

Screen Types

DB 7-116 F
DG 7-116 F
DN 7-116 F
DP 7-116 F

System Structure

Arrangement of Electrodes:



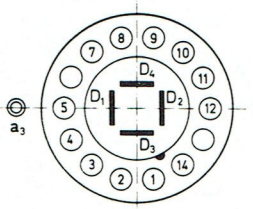
Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base Connections

(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — D_3
8 — D_4
9 — a_2
10 — D_2
11 — D_1
12 — i. c.
14 — f
A — a_3

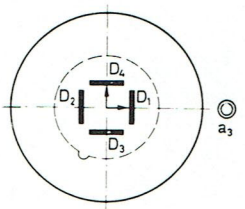


Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Deflection

(viewed from screen end)



Minimum Useful Screen Diameter 70 mm

Heating

U_f = 6.3 V
I_f = 600 mA

Maximum Ratings

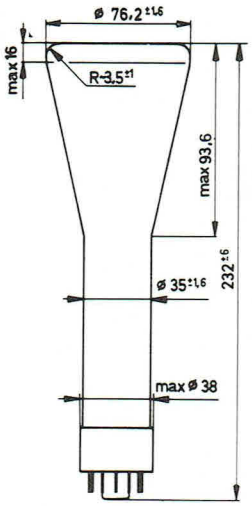
U_{a3} = 4 kV
U_{a2} = 2 kV
U_{a1} = 1 kV

Typical Operation

U_{a3}	=	4 kV
U_{a2}	=	2 kV
U_{a1}	=	400...690 V
$-U_{g1\ cut\ off}$	=	30...90 V
d_{12}	=	67...91 V/cm
d_{34}	=	49...67 V/cm

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART 5
Post-Deflection Accelerator Terminal: VST 2



with flat faceplate, for low and medium operating voltages

Application

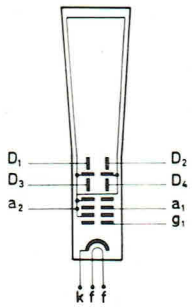
in small size portable oscilloscopes for medical and industrial purposes

Screen Types

DG 7-119/3RP1A
DH 7-119/3RP31A

System Structure

Arrangement of Electrodes:



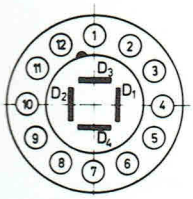
Deflection Method: electrostatic, symmetrical

Focusing Method: electrostatic

Base Connections

(bottom view)

1 — f
2 — g_1
3 — k
4 — a_1
5 — i. c.
6 — D_3
7 — D_4
8 — a_2
9 — D_2
10 — D_1
11 — i. c.
12 — f

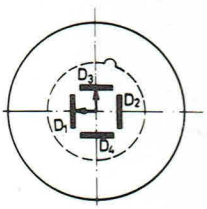


Base

Small-Shell Duodecal, 12-pin, JETEC No. B12-43

Deflection

(viewed from screen end)



Minimum Useful Screen Diameter 70 mm

Heating

U_f = 6.3 V
I_f = 600 mA

Maximum Ratings

U_{a2} = 2.5 kV
U_{a1} 1 kV

Typical Operation

U_{a2}	=	1 kV
U_{a1}	=	165...310 V
$-U_{g1\ cut\ off}$	=	max. 67,5 V
d_{12}	=	28,5...39 V/cm
d_{34}	=	20,5...27,5 V/cm

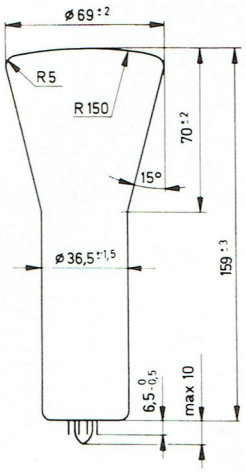
Accessories

Socket: VST 10
Metallic Shield: ART-K601

for asymmetrical operation with short overall length, for low operating voltages

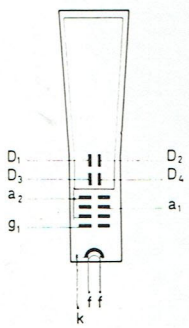
Application

low anode voltage indicator tube for asymmetrical horizontal deflection



System Structure

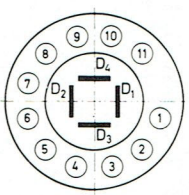
Arrangement of Electrodes:



Base Connections

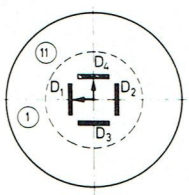
(bottom view)

1 — f
2 — f
3 — g_1
4 — k
5 — a_1
6 — D_3
7 — D_4
8 — a_2
9 — D_2
10 — D_1
11 — i. c.



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, D_{12} asymmetrical (D_2 must be connected to a_2), D_{34} symmetrical

Focusing Method:
electrostatic

Base

Small-Button Unidecar, 11-pin, JETEC No. E11-22

Minimum Useful Screen Diameter 63 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

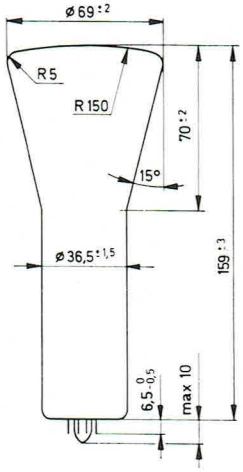
U_{a2} = 1 kV
U_{a1} = 0.4 kV

Typical Operation

U_{a2}	=	0.8 kV	
U_{a1}	=	0...180 V	
$-U_{g1\ cut\ off}$	=	80...160 V	
d_{12}	=	36...44 V/cm	H
d_{34}	=	24...30 V/cm	V

Accessories

Socket: VST 8
Metallic Shield: ART-K411



for symmetrical operation with short overall length, for low operating voltages

Application

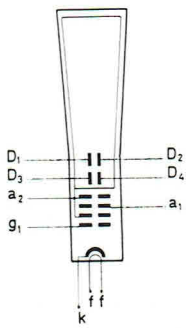
low anode voltage indicator tube

Screen Types

DG 7-124
DN 7-124

System Structure

Arrangement of Electrodes:



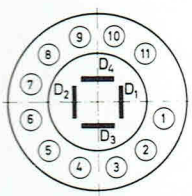
Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base Connections

(bottom view)

1 — f
2 — f
3 — g_1
4 — k
5 — a_1
6 — D_3
7 — D_4
8 — a_2
9 — D_2
10 — D_1
11 — i. c.

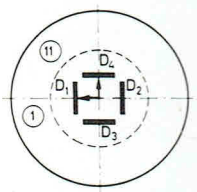


Base

Small-Button Unidecar, 11-pin, JETEC No. E11-22

Deflection

(viewed from screen end)



Minimum Useful Screen Diameter 63 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

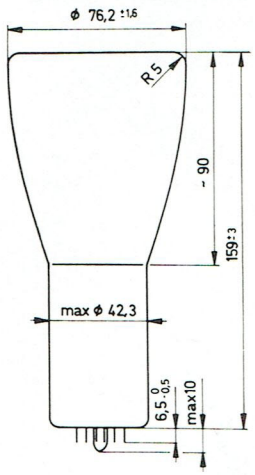
U_{a2} = 1 kV
U_{a1} = 0.4 kV

Typical Operation

U_{a2}	=	0.8 kV
U_{a1}	=	0...180 V
$-U_{g1\ cut\ off}$	=	80...160 V
d_{12}	=	36...44 V/cm H
d_{34}	=	24...30 V/cm V

Accessories

Socket: VST 8
Metallic Shield: ART-K411



with cathode of low heating power, flat faceplate and short overall length, for low operating voltages. Type K 2007 . . with fast warm-up cathode. The data of this type are tentative.

Application

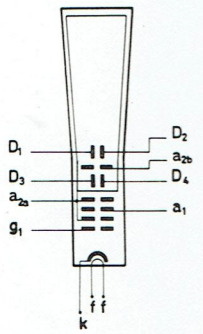
in small size portable transistorized oscilloscopes and other equipments of low operating voltage

Screen Types

DG 7-125	K 2007 GJ
DP 7-125	K 2007 GM

System Structure

Arrangement of Electrodes:



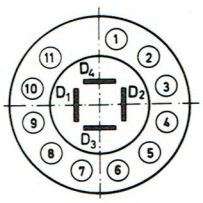
Deflection Method: electrostatic, symmetrical

Focusing Method: electrostatic

Base Connections

(bottom view)

1 — f
2 — f
3 — g_1
4 — k
5 — a_1
6 — D_2
7 — D_1
8 — a_{2a}
9 — D_3
10 — D_4
11 — a_{2b}

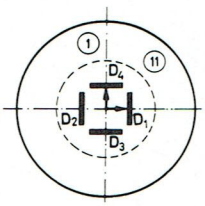


Base

Small-Button Unidecar, 11-pin, JETEC No. E11-22

Deflection

(viewed from screen end)



Minimum Useful Screen Diameter 65 mm

Heating

D. 7-125:
U_f = 6.3 V
I_f = 95 mA
K 2007 . . :
U_f = 0.5 V
I_f = 800 mA
t_h = 1.5 . . . 2 s

Typical Operation

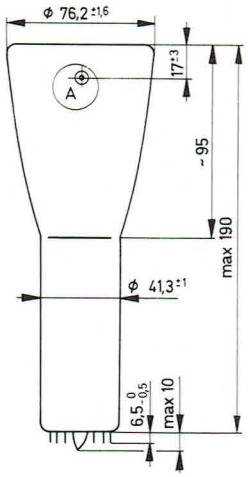
U_{a2a}	= 0.8 kV	
U_{a1}	= 0 . . . 180 V	
$-U_{g1\ cut\ off}$	= 30 . . . 60 V	
d_{12}	= 36 . . . 44 V/cm	H
d_{34}	= 24 . . . 30 V/cm	V

Maximum Ratings

U_{a2a} = 1.6 kV
U_{a1} = 0.4 kV

Accessories

Socket: VST8
Metallic Shield: ART-K591A



with spiral post-deflection accelerator, for medium operating voltages

Application

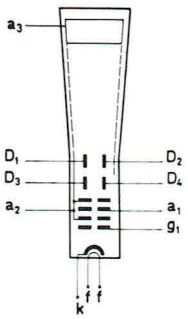
in small oscilloscopes of high brightness and other equipments; with W-screen as monitor tube in small size display devices

Screen Types

DB 7-126
DG 7-126
DN 7-126
DP 7-126
DW 7-126

System Structure

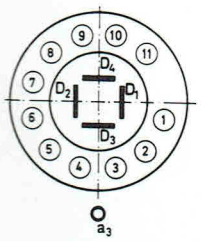
Arrangement of Electrodes:



Base Connections

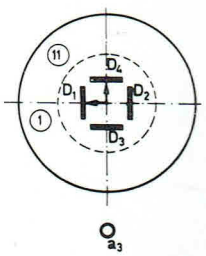
(bottom view)

1 — f
2 — f
3 — g_1
4 — k
5 — a_1
6 — D_3
7 — D_4
8 — a_2
9 — D_2
10 — D_1
11 — i. c.
A — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

Small-Button Unidecar, 11-pin, JETEC No. E11-22

Minimum Useful Screen Diameter 68 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

U_{a3} = 4 kV
U_{a2} = 1 kV
U_{a1} = 0.4 kV

Typical Operation

U_{a3}	=	4 kV	
U_{a2}	=	1 kV	
U_{a1}	=	0...250 V	
$-U_{g1\ cut\ off}$	=	30...180 V	
d_{12}	=	55...62.5 V/cm	H
d_{34}	=	37.5...46 V/cm	V

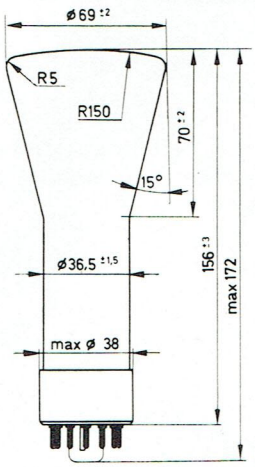
Accessories

Socket: VST 8
Metallic Shield: ART-K501A
Post-Deflection Accelerator Terminal: VST 2

for asymmetrical operation with low operating voltages

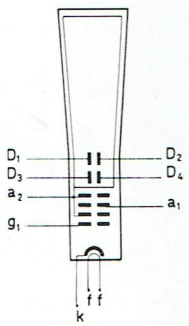
Application

low anode voltage indicator tube for asymmetrical horizontal deflection



System Structure

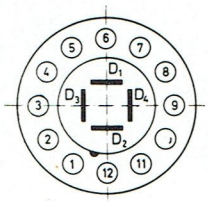
Arrangement of Electrodes:



Base Connections

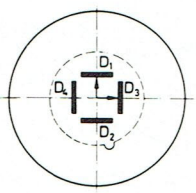
(bottom view)

1 — f
2 — g_1
3 — k
4 — a_1
5 — i. c.
6 — D_3
7 — D_4
8 — a_2
9 — D_1
10 — D_2
11 — i. c.
12 — f



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, D_{12} asymmetrical (D_1 must be connected to a_2), D_{34} symmetrical

Focusing Method:
electrostatic

Base

Small-Shell Duodecal, 12-pin, JETEC No. B12-43

Minimum Useful Screen Diameter 63 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Typical Operation

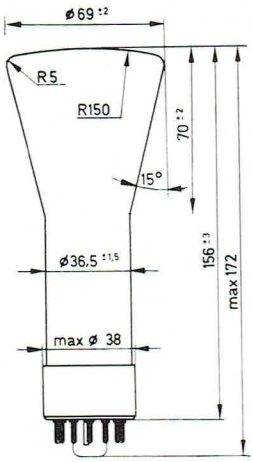
U_{a_2}	=	0.5 kV
U_{a_1}	=	0...120 V
$-U_{g1\ cut\ off}$	=	50...100 V
d_{12}	=	33.3...41.5 V/cm H
d_{34}	=	18.8...23.2 V/cm V

Maximum Ratings

U_{a2} = 0.8 kV
U_{a1} = 0.2 kV

Accessories

Socket: VST 10
Metallic Shield: ART-K461A



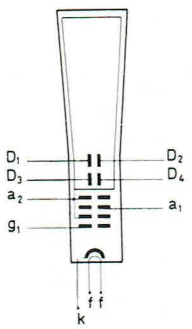
for symmetrical operation with low operating voltages

Application

low anode voltage indicator tube

System Structure

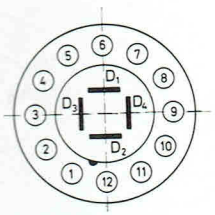
Arrangement of Electrodes:



Base Connections

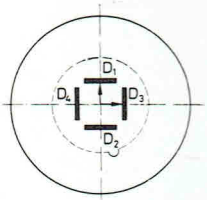
(bottom view)

1 — f
2 — g_1
3 — k
4 — a_1
5 — i. c.
6 — D_3
7 — D_4
8 — a_2
9 — D_1
10 — D_2
11 — i. c.
12 — f



Deflection

(viewed from screen end)



Deflection Method: electrostatic, symmetrical

Focusing Method: electrostatic

Base

Small-Shell Duodecal, 12-pin, JETEC No. B12-43

Minimum Useful Screen Diameter 63 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Typical Operation

U_{a2}	=	0.5 kV	
U_{a1}	=	0...120 V	
$-U_{g1\ cut\ off}$	=	50...100 V	
d_{12}	=	33.3...41.5 V/cm	H
d_{34}	=	18.8...23.2 V/cm	V

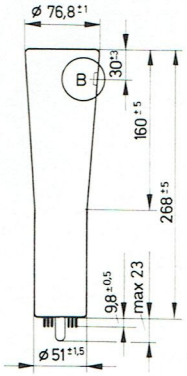
Maximum Ratings

U_{a2} = 0.8 kV
U_{a1} = 0.2 kV

Accessories

Socket: VST 10
Metallic Shield: ART-K461A

of high deflection sensitivity, with flat faceplate and mesh post-deflection accelerator, for medium operating voltages



Application

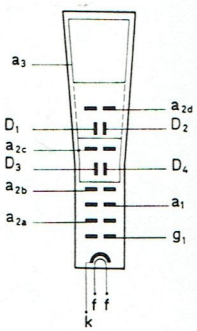
in small size transistorized broad-band oscilloscopes

Screen Types

DB 7-176
DG 7-176
DH 7-176
DN 7-176
DP 7-176

System Structure

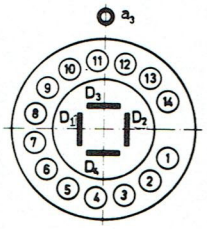
Arrangement of Electrodes:



Base Connections

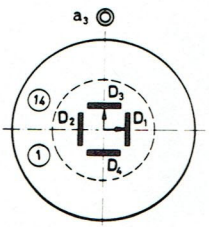
(bottom view)

1 — f
2 — k
3 — g_1
4 — a_1
5 — a_{2c}
6 — D_4
7 — D_3
8 — a_{2b}
9 — D_1
10 — D_2
11 — i. c.
12 — a_{2a}
13 — a_{2d}
14 — f
B — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 14-pin

Minimum Useful Deflection

in direction D_{12}: 65 mm
in direction D_{34}: 50 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

U_{a3} = 8 kV
U_{a2a} = 1.2 kV
U_{a1} = 1 kV

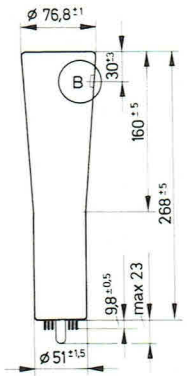
Typical Operation

U_{a3}	=	3 kV	
U_{a2a}	=	0.5 kV	
U_{a1}	=	20...200 V	
$-U_{g1\ cut\ off}$	=	25...75 V	
d_{12}	=	7.3...10 V/cm	H
d_{34}	=	4.25...5.85 V/cm	V

Accessories

Socket: VST 7
Metallic Shield: ART 4
Post-Deflection Accelerator Terminal: VST-K005

of high deflection sensitivity, with flat faceplate and spiral post-deflection accelerator, for medium operating voltages



Application

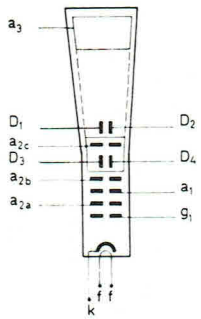
in small size transistorized broad-band oscilloscopes

Screen Types

DB 7-178
DH 7-178
DN 7-178
DP 7-178

System Structure

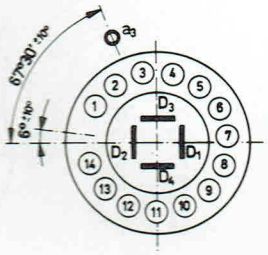
Arrangement of Electrodes:



Base Connections

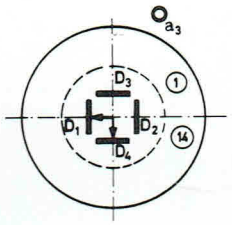
(bottom view)

1 — f
2 — k
3 — g_1
4 — a_1
5 — a_{2c}
6 — D_3
7 — D_4
8 — a_{2b}
9 — D_2
10 — D_1
11 — i. c.
12 — a_{2a}
13 — i. c.
14 — f
B — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 14-pin

Minimum Useful Deflection at $U_{a3}/U_{a2b}=4$

in direction D_{12}: 60 mm
in direction D_{34}: 45 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

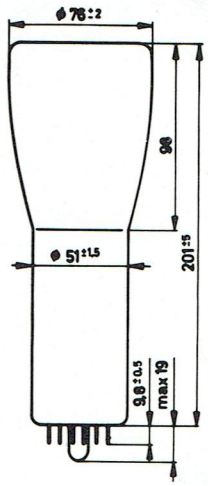
U_{a3} = 5 kV
U_{a2a} = 1.6 kV
U_{a1} = 1 kV

Typical Operation

U_{a3}	=	4 kV	
U_{a2a}	=	1 kV	
U_{a1}	=	35...165 V	
$-U_{g1\ cut\ off}$	=	30...60 V	
d_{12}	=	31...40 V/cm	H
d_{34}	=	10.5...13.7 V/cm	V

Accessories

Socket: VST 7
Metallic Shield: ART 4
Post-Deflection Accelerator Terminal: VST-K005



with flat faceplate and short overall length, for low operating voltages. Tentative data

Application

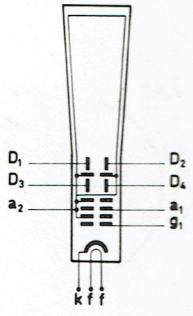
in small size portable transistorized oscilloscopes, industrial and medical instruments

Screen Types

D 7-190 GH/T
D 7-190 GL/T
D 7-190 GM/T

System Structure

Arrangement of Electrodes:



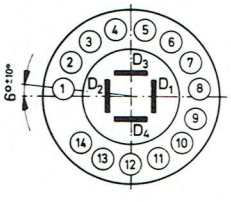
Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base Connections

(bottom view)

1 — f
2 — i. c.
3 — g_1
4 — D_2
5 — i. c.
6 — D_1
7 — k
8 — a_1
9 — a_2
10 — D_3
11 — i. c.
12 — D_4
13 — i. c.
14 — f

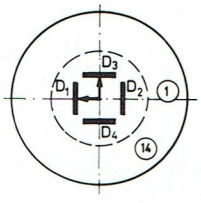


Base

special, 14-pin

Deflection

(viewed from screen end)



Minimum Useful Deflection

in direction D_{12}: 60 mm
in direction D_{34}: 50 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

U_{a2a} = 2.2 kV
U_{a1} = 2.2 kV

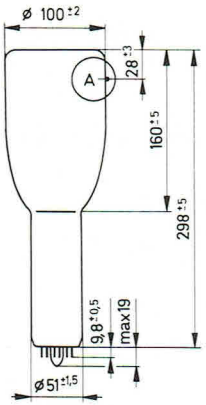
Typical Operation

U_{a2}	=	1000 ± 25 V	
U_{a1}	=	100 . . . 180 V	
$-U_{g1\ cut\ off}$	=	max. 35 V	
d_{12}	=	29 (max. 31) V/cm	H
d_{34}	=	11.5 (max. 12.5) V/cm	V

Accessories

Socket: VST 7
Metallic Shield: ART-K651

of high deflection sensitivity, with flat faceplate and spiral post-deflection accelerator, for medium operating voltages



Application

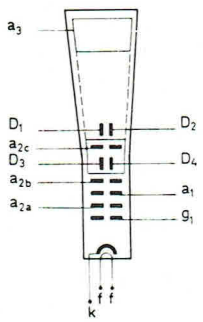
in medium size universal oscilloscopes

Screen Types

D 10-12 BE
D 10-12 GH
D 10-12 GL
D 10-12 GM

System Structure

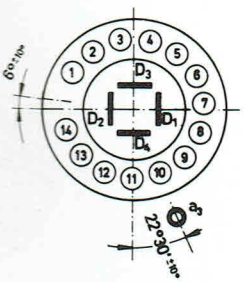
Arrangement of Electrodes:



Base Connections

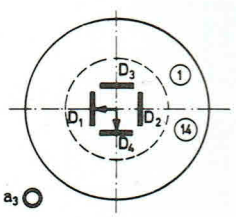
(bottom view)

1 — f
2 — k
3 — g_1
4 — a_1
5 — a_{2c}
6 — D_3
7 — D_4
8 — a_{2b}
9 — D_2
10 — D_1
11 — i. c.
12 — a_{2a}
13 — i. c.
14 — f
A — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 14-pin

Minimum Useful Deflection

in direction D_{12}: 85 mm
in direction D_{34}: 60 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

U_{a3} = 5 kV
U_{a2a} = 2.2 kV
U_{a1} = 1.5 kV

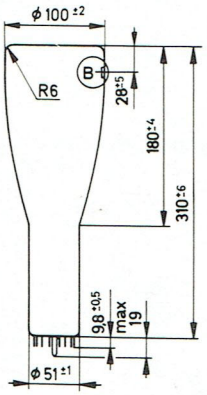
Typical Operation

U_{a3}	=	4 kV
U_{a2a}	=	1 kV
U_{a1}	=	50...200 V
$-U_{g1\ cut\ off}$	=	25...67 V
d_{12}	=	24...31 V/cm H
d_{34}	=	8.6...11 V/cm V

Accessories

Socket: VST 7
Metallic Shield: ART-K451
Post-Deflection Accelerator Terminal: VST 2

of high deflection sensitivity, with metal-backed flat faceplate and mesh post-deflection accelerator, for medium operating voltages



Application

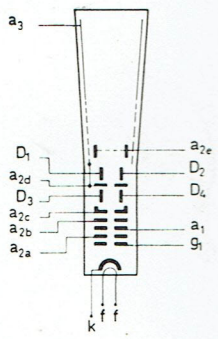
in small size transistorized broad-band oscilloscopes

Screen Types

DB 10-111
DH 10-111
DN 10-111
DP 10-111

System Structure

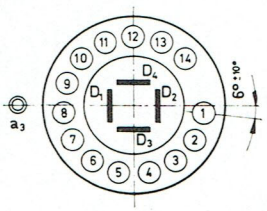
Arrangement of Electrodes:



Base Connections

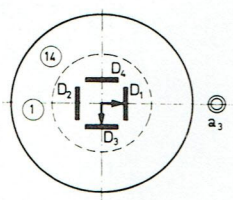
(bottom view)

1 — f
2 — a_{2c}
3 — g_1
4 — D_2
5 — a_{2a}
6 — D_1
7 — k
8 — a_1
9 — a_{2b}
10 — D_3
11 — a_{2d}
12 — D_4
13 — a_{2e}
14 — f
B — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 14-pin

Minimum Useful Deflection

in direction D_{12}: 80 mm
in direction D_{34}: 60 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

U_{a3} = 8 kV
U_{a2a} = 2.2 kV
U_{a1} = 1 kV

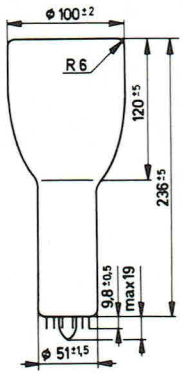
Typical Operation

U_{a3}	=	6 kV	
U_{a2a}	=	1 kV	
U_{a1}	=	100...300 V	
$-U_{g1\ cut\ off}$	=	40...80 V	
d_{12}	=	12.5 V/cm	H
d_{34}	=	4 V/cm	V

Accessories

Socket: VST 7
Metallic Shield: ART-K531
Post-Deflection Accelerator Terminal: VST-K005

with flat faceplate and short overall length, for low operating voltages. Tentative data



Application

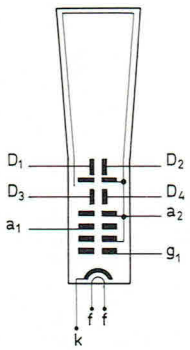
in medium size low frequency oscilloscopes

Screen Types

D 10-160 GH/T
D 10-160 GJ/T
D 10-160 GL/T
D 10-160 GM/T

System Structure

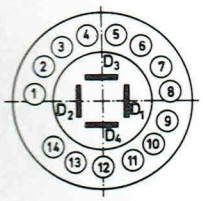
Arrangement of Electrodes:



Base Connections

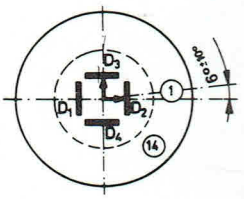
(bottom view)

1 — f
2 — i. c.
3 — g_1
4 — D_2
5 — i. c.
6 — D_1
7 — k
8 — a_1
9 — a_2
10 — D_3
11 — i. c.
12 — D_4
13 — i. c.
14 — f



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 14-pin

Minimum Useful Deflection

in direction D_{12}: 80 mm
in direction D_{34}: 60 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

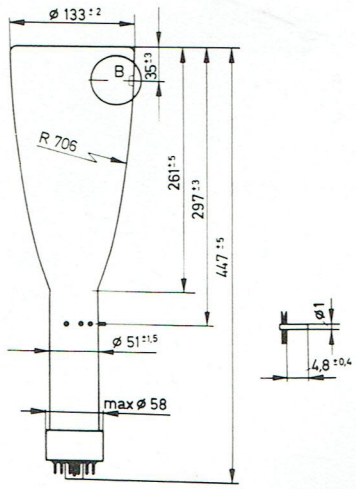
U_{a2} = 2.2 kV
U_{a1} = 2.2 kV

Typical Operation

U_{a2}	=	1500 ± 30 V	
U_{a1}	=	150 . . . 275 V	
$-U_{g1\ cut\ off}$	=	max. 50 V	
d_{12}	=	29.5 . . . 31.5 V/cm	H
d_{34}	=	12 . . . 13.2 V/cm	V

Accessories

Socket: VST 7
Metallic Shield: ART-K661



of high deflection sensitivity, with metal-backed flat faceplate, spiral post-deflection accelerator and small capacitance deflection plates with side contacts, for high operating voltages

Application

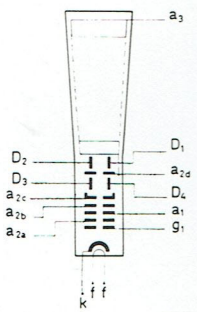
in broad-band oscilloscopes of high cut-off frequency

Screen Types

D 13-19 BE
D 13-19 GH
D 13-19 GL
D 13-19 GM

System Structure

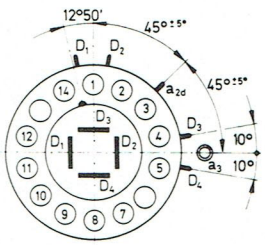
Arrangement of Electrodes:



Base Connections

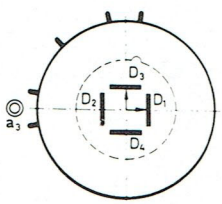
(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — i. c.
8 — a_{2a}
9 — a_{2b}
10 — i. c.
11 — a_{2c}
12 — i. c.
14 — f
B — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Minimum Useful Deflection at $U_{a3}/U_{a2b}=6$

in direction D_{12}: 100 mm
in direction D_{34}: 60 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

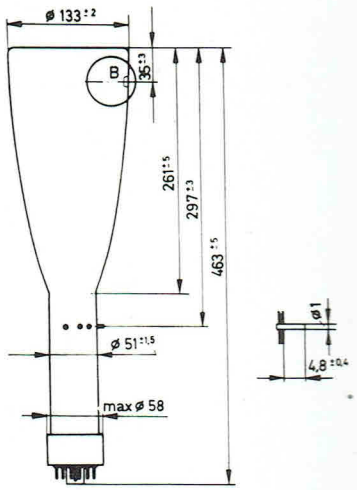
U_{a3} = 12 kV
U_{a2a} = 2.2 kV
U_{a1} = 1.5 kV

Typical Operation

U_{a3}	=	10 kV	
U_{a2a}	=	1.67 kV	
U_{a1}	=	320...500 V	
$-U_{g1\ cut\ off}$	=	53...82 V	
d_{12}	=	27...33 V/cm	H
d_{34}	=	9.5...12.4 V/cm	V

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART-K002
Post-Deflection Accelerator Terminal: VST-K005
Side Contacts: VST 9 (5 pcs.)



of high deflection sensitivity, with metal-backed flat faceplate, spiral post-deflection accelerator and small capacitance deflection plates with side contacts, for high operating voltages. With internal graticules: Type D 13-21 ../01

Application

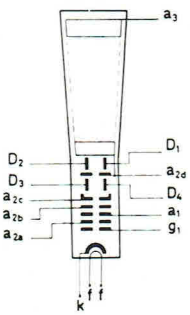
in broad-band oscilloscopes of high cut-off frequency

Screen Types

D 13-21 BE
D 13-21 GH
D 13-21 GL

System Structure

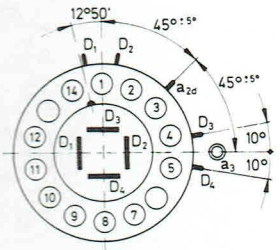
Arrangement of Electrodes:



Base Connections

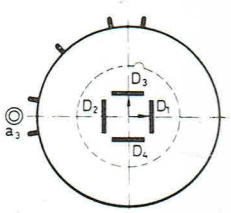
(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — i. c.
8 — a_{2a}
9 — a_{2b}
10 — i. c.
11 — a_{2c}
12 — i. c.
14 — f
B — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Minimum Useful Deflection at $U_{a3}/U_{a2b} = 6$

in direction D_{12}: 100 mm
in direction D_{34}: 40 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

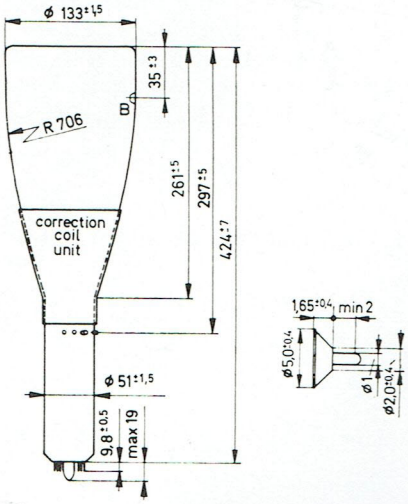
U_{a3} = 12 kV
U_{a2a} = 2.1 kV
U_{a1} = 1.5 kV

Typical Operation

U_{a3}	=	10 kV	
U_{a2a}	=	1.67 kV	
U_{a1}	=	200...500 V	
$-U_{g1\ cut\ off}$	=	50...80 V	
d_{12}	=	27...33.5 V/cm	H
d_{34}	=	5.7...7.2 V/cm	V

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART-K002 for type D 13-21 .., ART-K003 for type D 13-21 ../01
Post-Deflection Accelerator Terminal: VST-K005
Side Contacts: VST 9 (5 pcs.)
Coil body of magnet: VST-K003 for type with internal graticules



of high deflection sensitivity, with metal-backed flat faceplate, mesh post-deflection accelerator, small capacitance deflection plates with side contacts and correction coils for centring, for high operating voltages. Tentative data

Application

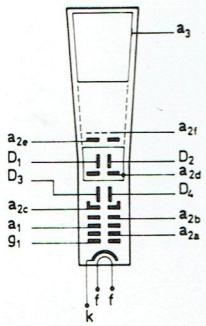
in transistorized broad-band devices

Screen Types

D 13-26 BE
D 13-26 GH
D 13-26 GL
D 13-26 GM

System Structure

Arrangement of Electrodes:



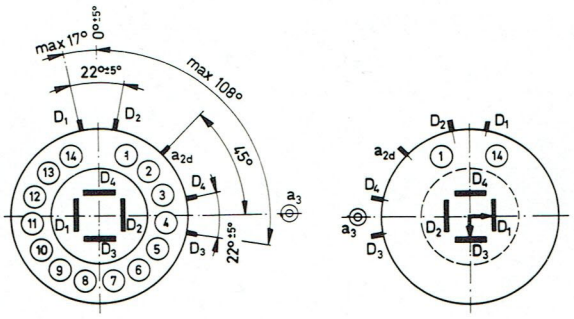
Base Connections

(bottom view)

1 — f
2 — k
3 — g_1
4 — a_1
5 — a_{2e}
6 — a_{2f}
7 — a_{2c}
8 — a_{2b}
9 — a_{2a}
10 — i. c.
11 — i. c.
12 — a_{2a}
13 — i. c.
14 — f
B — a_3

Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 14-pin

Minimum Useful Deflection

in direction D_{12}: 100 mm
in direction D_{34}: 60 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

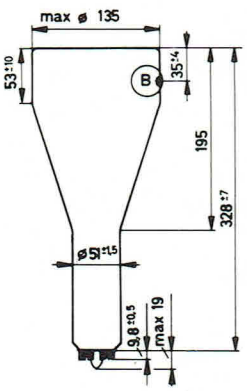
U_{a3} = 16.5 kV
U_{a2a} = 2.5 kV
U_{a1} = 2.5 kV

Typical Operation

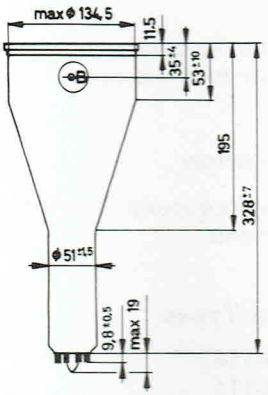
U_{a3}	=	15 kV
U_{a2a}	=	1.5 kV
U_{a1}	=	375...625 V
$-U_{g1\ cut\ off}$	=	40...90 V
d_{12}	=	8...11 V/cm
d_{34}	=	2.3....3.5 V/cm

Accessories

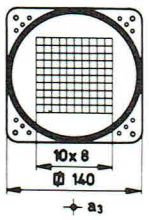
Socket: VST 7
Metallic Shield: ART-K001
Post-Deflection Accelerator Terminal: VST-K005
Side Contacts: VST 9 (5 pcs.)

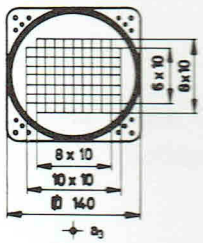


Internal graticules of D 13-27 . ./04S



Internal graticules of D 13-27 . ./02S





of high deflection sensitivity, with flat faceplate, spiral post-deflection accelerator and beam blanking, for medium operating voltages. With not illuminable graticules: D 13-27 . ./01, D 13-27 . ./03; with illuminable graticules with illumination equipment: D 13-27 . ./02S, D 13-27 . ./04S

Application

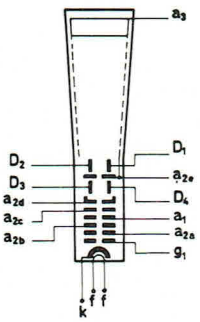
in universal oscilloscopes and medical instruments

Screen Types

D 13-27 BE
D 13-27 GH
D 13-27 GL
D 13-27 GM

System Structure

Arrangement of Electrodes:



Deflection Method:
electrostatic, symmetrical
Focusing Method:
electrostatic

Base Connections

(bottom view)

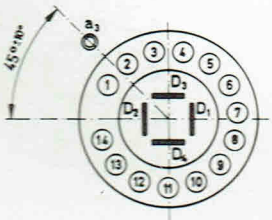
1 — f
2 — k
3 — g_1
4 — a_1
5 — a_{2c}
6 — D_3
7 — D_4
8 — a_{2c}
9 — D_1
10 — D_2
11 — a_{2b}
12 — a_{2a}
13 — a_{2d}
14 — f
B — a_3

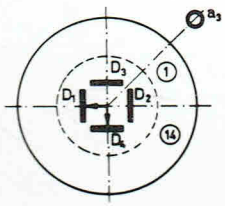
Base

special, 14-pin

Deflection

(viewed from screen end)





Minimum Useful Deflection

in direction D_{12}: 100 mm
in direction D_{34}: 80 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

U_{a3} = 5 kV
U_{a2a} = 1.7 kV
U_{a1} = 1.2 kV

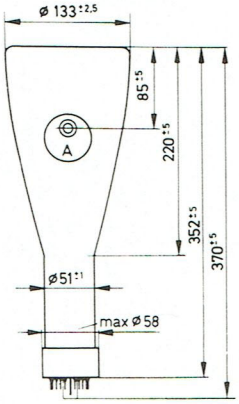
Typical Operation

U_{a3}	=	3 kV
U_{a2a}	=	1.5 kV
U_{a1}	=	200..380 V
$-U_{g1\ cut\ off}$	=	38...135 V
d_{12}	=	21...27 V/cm
d_{34}	=	9.8...12.2 V/cm

Accessories

Socket: VST 7
Metallic Shield: ART-K521A for type D 13-27. ., ART-K522A for types with internal graticules
Post-Deflection Accelerator Terminal: VST-K005
Coil body of magnet: VST-K003 for types with internal graticules

with flat faceplate and post-deflection accelerator, for medium operating voltages



Application

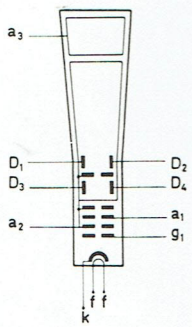
in low-frequency oscilloscopes and industrial instruments

Screen Types

DB 13-114
DG 13-114
DN 13-114
DP 13-114

System Structure

Arrangement of Electrodes:



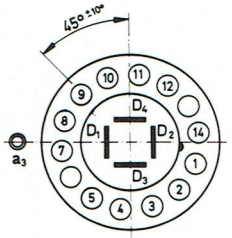
Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base Connections

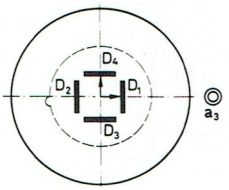
(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — D_3
8 — D_4
9 — a_2
10 — D_1
11 — D_2
12 — i. c.
14 — f
A — a_3



Deflection

(viewed from screen end)



Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Minimum Useful Deflection

in direction D_{12}: 102 mm
in direction D_{34}: 102 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

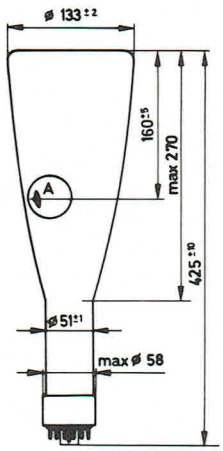
U_{a3} = 6 kV
U_{a2} = 3 kV
U_{a1} = 1.5 kV

Typical Operation

U_{a3}	=	4 kV	
U_{a2}	=	2 kV	
U_{a1}	=	360...620 V	
$-U_{g1\ cut\ off}$	=	48...82 V	
d_{12}	=	30...37 V/cm	H
d_{34}	=	24...30 V/cm	V

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART 7
Post-Deflection Accelerator Terminal: VST 2



with post-deflection accelerator, for medium operating voltages

Application

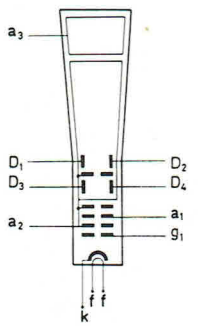
for displaying high speed non-recurring phenomena, e.g. for surge voltage tests

Screen Types

DB 13-116 F
DG 13-116 F
DN 13-116 F
DP 13-116 F

System Structure

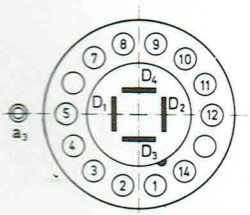
Arrangement of Electrodes:



Base Connections

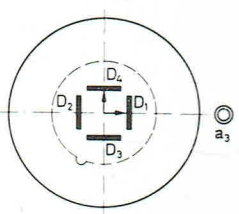
(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — D_3
8 — D_4
9 — a_2
10 — D_2
11 — D_1
12 — i. c.
14 — f
A — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Minimum Useful Screen Diameter 114 mm

Heating

U_f = 6.3 V
I_f = 600 mA

Maximum Ratings

U_{a3} = 4.4 kV
U_{a2} = 2.2 kV
U_{a1} = 1 kV

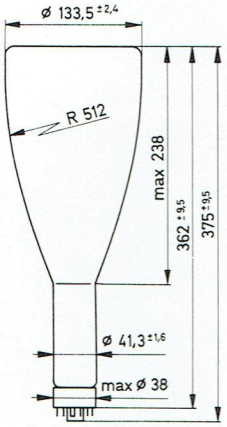
Typical Operation

U_{a3}	=	4 kV	
U_{a2}	=	2 kV	
U_{a1}	=	370...690 V	
$-U_{g1\ cut\ off}$	=	30...90 V	
d_{12}	=	30.5...42 V/cm	H
d_{34}	=	26...35.5 V/cm	V

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART 3Z
Post-Deflection Accelerator Terminal: VST 2

with flat faceplate, for medium operating voltages



Application

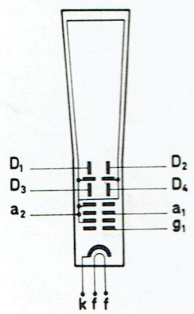
in service oscilloscopes and for display purposes

Screen Types

DB 13-132 F
DG 13-132 F
DN 13-132 F
DP 13-132 F

System Structure

Arrangement of Electrodes:



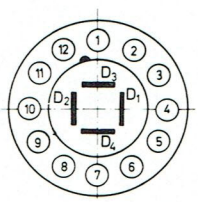
Deflection Method: electrostatic, symmetrical

Focusing Method: electrostatic

Base Connections

(bottom view)

1 — f
2 — g_1
3 — k
4 — a_1
5 — i. c.
6 — D_3
7 — D_4
8 — a_2
9 — D_2
10 — D_1
11 — i. c.
12 — f

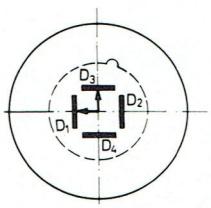


Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Deflection

(viewed from screen end)



Minimum Useful Screen Diameter 114 mm

Heating

U_f = 6.3 V
I_f = 600 mA

Maximum Ratings

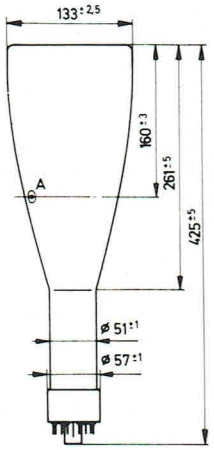
U_{a2} = 2.75 kV
U_{a1} = 1.1 kV

Typical Operation

U_{a2}	=	2 kV
U_{a1}	=	340...640 V
$-U_{g1\ cut\ off}$	=	30...90 V
d_{12}	=	22...30.5 V/cm H
d_{34}	=	18...24.5 V/cm V

Accessories

Metallic Shield: ART-K471



of high deflection sensitivity, with flat faceplate and post-deflection accelerator, for medium operating voltages

Application

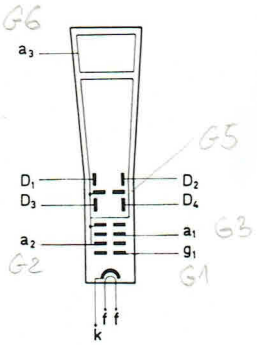
in oscilloscopes for observing very high speed non-recurring phenomena

Screen Types

DB 13-134
DG 13-134
DN 13-134
DP 13-134

System Structure

Arrangement of Electrodes:



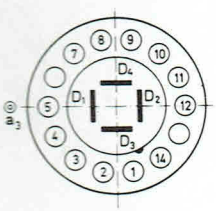
Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base Connections

(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — D_3
8 — D_4
9 — a_2
10 — D_2
11 — D_1
12 — i. c.
14 — f
A — a_3

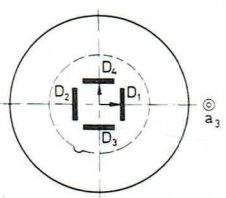


Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Deflection

(viewed from screen end)



Minimum Useful Deflection

in direction D_{12}: 102 mm
in direction D_{34}: 102 mm

Heating

U_f = 6.3 V
I_f = 600 mA

Maximum Ratings

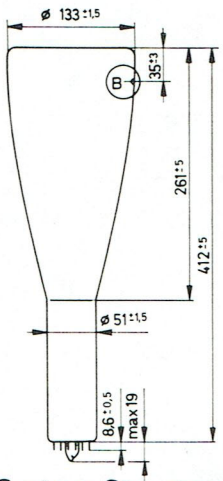
U_{a3} = 6 kV
U_{a2} = 2.6 kV
U_{a1} = 1 kV

Typical Operation

U_{a3}	=	4 kV
U_{a2}	=	2 kV
U_{a1}	=	400...700 V
$-U_{g1\ cut\ off}$	=	45...75 V
d_{12}	=	21...26 V/cm H
d_{34}	=	16...20 V/cm V

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART-3Z
Post-Deflection Accelerator Terminal: VST 2



of high deflection sensitivity, with metal-backed flat faceplate and spiral post-deflection accelerator, for medium and high operating voltages

Application

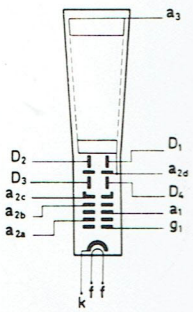
in oscilloscopes of medium bandwidth, as well as in medical and industrial instruments

Screen Types

DH 13-136
DN 13-136
DP 13-136

System Structure

Arrangement of Electrodes:



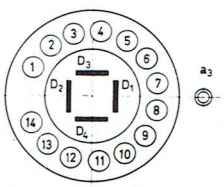
Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base Connections

(bottom view)

1 — f
2 — k
3 — g_1
4 — a_1
5 — a_{2d}
6 — D_3
7 — D_4
8 — a_{2b}
9 — D_1
10 — D_2
11 — i. c.
12 — a_{2a}
13 — a_{2c}
14 — f
B — a_3

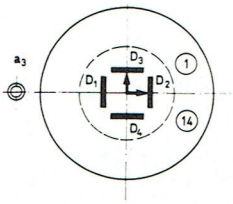


Base

special, 14-pin

Deflection

(viewed from screen end)



Minimum Useful Deflection at $U_{a3}/U_{a2}=2$, $U_{a3}=5$ kV, $U_{a2}=2.5$ kV

in direction D_{12}: 100 mm
in direction D_{34}: 100 mm

At the Given Typical Operation

in direction D_{12}: 100 mm
in direction D_{34}: 60 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

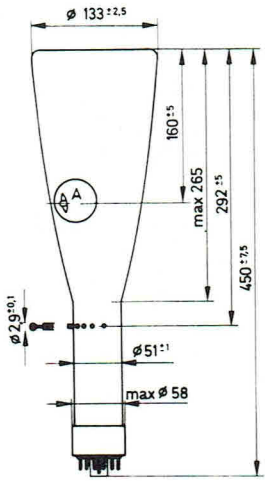
U_{a3} = 12 kV
U_{a2a} = 2.5 kV
U_{a1} = 1.5 kV

Typical Operation

U_{a3}	=	10 kV
U_{a2a}	=	1.67 kV
U_{a1}	=	320...500 V
$-U_{g1\ cut\ off}$	=	50...80 V
d_{12}	=	27...33 V/cm H
d_{34}	=	9.5...12.4 V/cm V

Accessories

Socket: VST 7
Metallic Shield: ART-K005
Post-Deflection Accelerator Terminal: VST-K005



of high deflection sensitivity, with flat faceplate, post-deflection accelerator and small capacitance deflection plates with side contacts, for medium operating voltages

Application

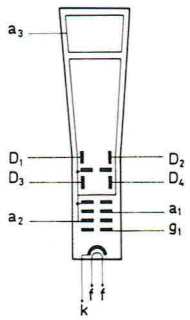
in broad-band oscilloscopes

Screen Types

DB 13-154
DG 13-154
DN 13-154
DP 13-154

System Structure

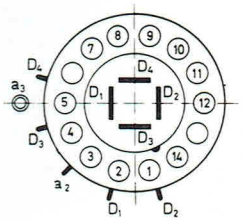
Arrangement of Electrodes:



Base Connections

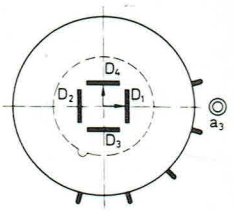
(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — i. c.
8 — i. c.
9 — i. c.
10 — i. c.
11 — i. c.
12 — i. c.
14 — f
A — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

U_{a3} = 8 kV
U_{a2} = 4 kV
U_{a1} = 2 kV

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART 3
Post-Deflection Accelerator Terminal: VST 2
Side Contacts: VST 1 (5 pcs.)

Base

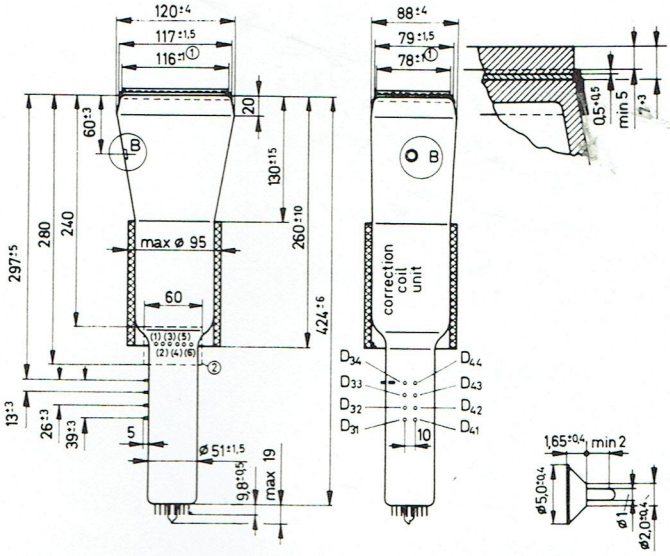
Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Typical Operation

U_{a3} = 4 kV
U_{a2} = 2 kV
U_{a1} = 360...700 V
$-U_{g1\ cut\ off}$ = 30...90 V
without post-deflection accelerator
d_{12} = 17...23 V/cm H
d_{34} = 7...14 V/cm V
with post-deflection accelerator
d_{12} = 24...28.5 V/cm H
d_{34} = 10...16 V/cm V

Minimum Useful Deflection

in direction D_{12}: 105 mm
in direction D_{34}: 65 mm



of high deflection sensitivity, with illuminable internal graticules, rectangular, metal-backed flat faceplate, mesh post-deflection accelerator and small capacitance deflection plates with side contacts. It is provided with in four parts divided vertical deflection plates and correction coils for centring and orthogonality adjustment. The tube is for high operating voltages. Tentative data

Application

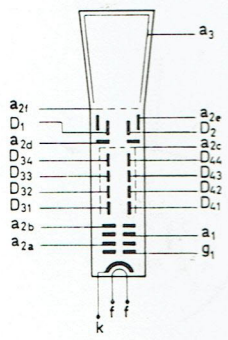
in transistorized devices up to 250 MHz bandwidth

Screen Types

D 13-450 GH/01
D 13-450 GL/01

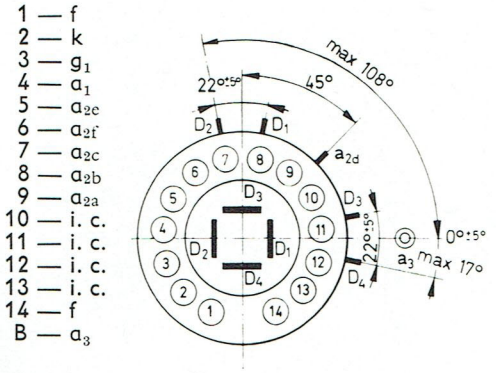
System Structure

Arrangement of Electrodes:



Base Connections

(bottom view)



Deflection

(viewed from screen end)

Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 14-pin

Minimum Useful Deflection

in direction D_{12}: 100 mm
in direction D_{34}: 60 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

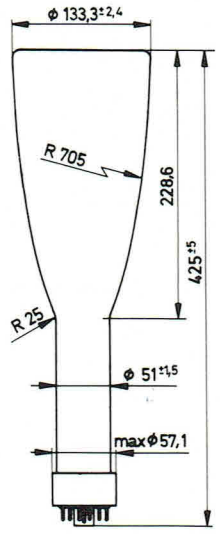
U_{a3} = 16.5 kV
U_{a2a} = 1.8 kV
U_{a1} = 2.4 kV

Typical Operation

U_{a3}	=	15 kV
U_{a2a}	=	1.5 kV
U_{a1}	=	400...550 V
$-U_{g1\ cut\ off}$	=	40...100 V
d_{12}	=	9.9 (max 11) V/cm
d_{34}	=	3 (max 3.3) V/cm

Accessories

Socket: VST 7
Metallic Shield: ART-K551
Post-Deflection Accelerator Terminal: VST-K005
Side Contacts: VST 9 (11 pcs.)



of high deflection sensitivity with flat faceplate, 5 AQP..A/T of close tolerance, for medium operating voltages

Application

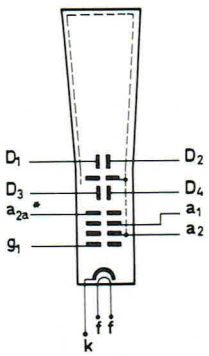
in service oscilloscopes and for medical purposes

Screen Types

5 AQP 1/T	5 AQP 1A/T	5 AQP 1AC/T	5 AQP 1C/T
5 AQP 2/T	5 AQP 2A/T	5 AQP 2AC/T	5 AQP 2C/T
5 AQP 7/T	5 AQP 7A/T	5 AQP 7AC/T	5 AQP 7C/T
5 AQP 11/T	5 AQP 11A/T	5 AQP 11AC/T	5 AQP 11C/T
5 AQP 31/T	5 AQP 31A/T	5 AQP 31AC/T	5 AQP 31C/T

System Structure

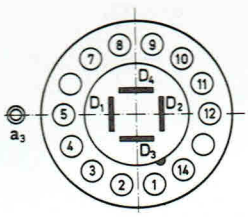
Arrangement of Electrodes:



Base Connections

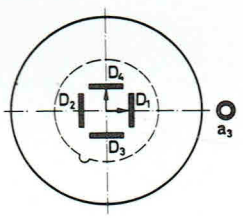
(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — D_3
8 — D_4
9 — a_2
10 — D_2
11 — D_1
12 — i. c.*
14 — f



Deflection

(viewed from screen end)



* At types 5AQP..C/T and 5AQP..AC/T: 12 — a_{2a}

Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Minimum Useful Deflection

in direction D_{12}: 102 mm
in direction D_{34}: 102 mm

Heating

U_f = 6.3 V
I_f = 600 mA

Typical Operation

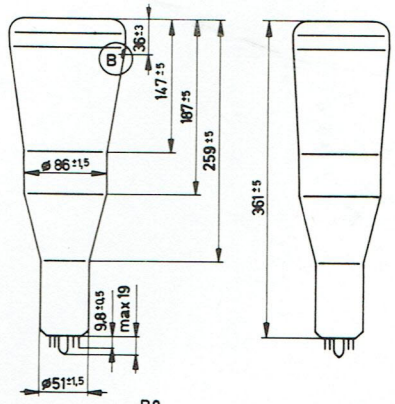
U_{a2}	=	2.5 kV
U_{a1}	=	0...300 V
$-U_{g1\ cut\ off}$	=	34...56 V
d_{12}	=	16...20 V/cm H
d_{34}	=	12.5...15 V/cm V

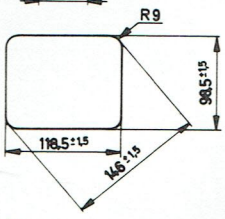
Maximum Ratings

U_{a2} = 4400 V
U_{a1} = 1650 V

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART-K008





of high deflection sensitivity, with rectangular flat faceplate, spiral post-deflection accelerator and ray extinction, for medium operating voltages. Data of K 2011 . . are tentative

Application

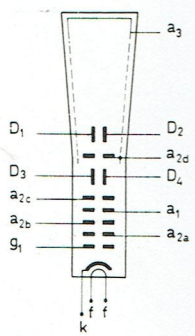
in service oscilloscopes of medium bandwidth and other equipments

Screen Types

D 14-180 GH/T	K 2011 GH
D 14-180 GM/T	K 2011 GM

System Structure

Arrangement of Electrodes:



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

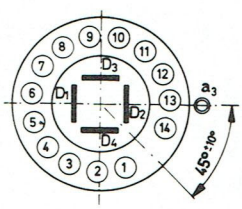
Heating

U_f = 6.3 V
I_f = 300 mA

Base Connections

(bottom view)

1 — f
2 — k
3 — g_1
4 — a_1
5 — a_{2d}
6 — D_4
7 — D_3
8 — a_{2a}
9 — D_1
10 — D_2
11 — a_{2b}
12 — a_{2c}
13 — i. c.
14 — f
B — a_3



Base

special, 14-pin

Maximum Ratings

D 14-180 . . /T

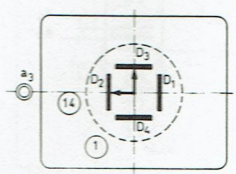
U_{a3} = 7 kV
U_{a2a} = 1.75 kV
U_{a1} = 1 kV

K 2011 . .

U_{a3} = 4 kV
U_{a2a} = 1.75 kV
U_{a1} = 1 kV

Deflection

(viewed from screen end)



Minimum Useful Deflection

in direction D_{12}: 100 mm
in direction D_{34}: 80 mm

Typical Operation

D 14-180 . . /T

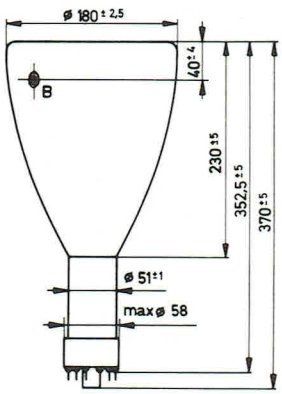
U_{a3}	=	6 kV	
U_{a2a}	=	1.5 kV	
U_{a1}	=	260 . . . 600 V	
$-U_{g1\ cut\ off}$	=	50 . . . 95 V	
d_{12}	=	21.2 . . . 25.5 V/cm	H
d_{34}	=	10 . . 13.1 V/cm	V

K 2011 . .

U_{a3}	=	3 kV	
U_{a2a}	=	1.5 kV	
U_{a1}	=	260 . . . 600 V	
$-U_{g1\ cut\ off}$	=	50 . . . 95 V	
d_{12}	=	15.6 . . . 18.5 V/cm	H
d_{34}	=	8.5 . . . 11.5 V/cm	V

Accessories

Socket: VST 7
Metallic Shield: ART-K611Z
Post-Deflection Accelerator Terminal: VST-K005
Coil body of magnet: VST-K006



with flat faceplate and spiral post-deflection accelerator, for medium operating voltages. With not illuminable graticules: D. 18-114/01, with illuminable graticules: D. 18-114/02.

Application

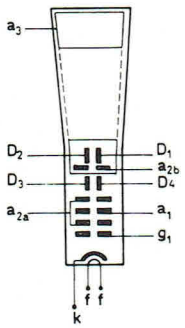
in large screen oscilloscopes

Screen Types

DB 18-114
DG 18-114
DH 18-114
DN 18-114
DP 18-114

System Structure

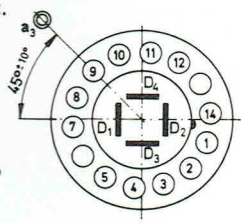
Arrangement of Electrodes:



Base Connections

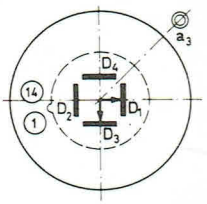
(bottom view)

1 — f
2 — k
3 — g_1
4 — i. c.
5 — a_1
7 — D_3
8 — D_4
9 — a_{2a}
10 — D_2
11 — D_1
12 — a_{2b}
14 — f
B — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

Medium-Shell Diheptal, 12-pin, JETEC No. B12-37

Minimum Useful Deflection

in direction D_{12}: 150 mm
in direction D_{34}: 150 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

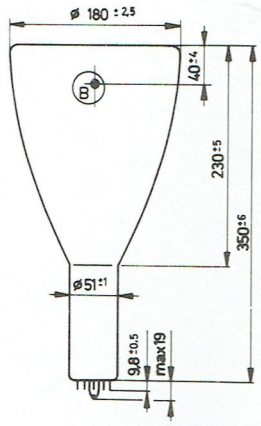
U_{a3} = 6 kV
U_{a2a} = 3 kV
U_{a1} = 1.5 kV

Typical Operation

U_{a3}	=	4 kV	
U_{a2a}	=	2 kV	
U_{a1}	=	200...600 V	
$-U_{g1\ cut\ off}$	=	45...95 V	
d_{12}	=	31.5...37.5 V/cm	H
d_{34}	=	26.5...31.5 V/cm	V

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART-K541Z for Type D. 18-114, ART-K543 for Type D. 18-114/01, ART-K543Z for Type D. 18-114/02
Post-Deflection Accelerator Terminal: VST-K005



with flat faceplate and spiral post-deflection accelerator, for medium operating voltages. With not illuminable graticules: D. 18-116/01, with illuminable graticules: D. 18-116/02.

Application

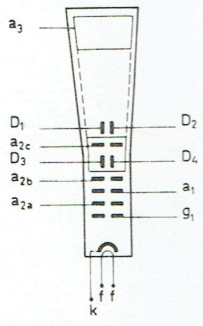
in large screen oscilloscopes

Screen Types

DB 18-116
DG 18-116
DH 18-116
DN 18-116
DP 18-116

System Structure

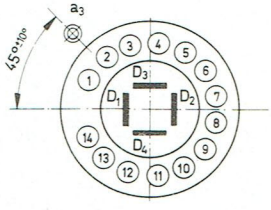
Arrangement of Electrodes:



Base Connections

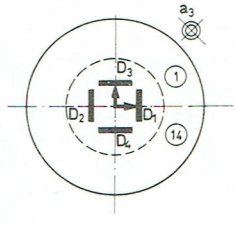
(bottom view)

1 — f
2 — k
3 — g_1
4 — a_1
5 — a_{2c}
6 — D_3
7 — D_4
8 — a_{2b}
9 — D_2
10 — D_1
11 — i. c.
12 — a_{2a}
13 — i. c.
14 — f
B — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 14-pin

Minimum Useful Deflection at $U_{a3}/U_{a2b}=2$

in direction D_{12}: 150 mm
in direction D_{34}: 150 mm

Heating

U_f = 6.3 V
I_f = 300 mA

Maximum Ratings

U_{a3} = 6 kV
U_{a2} = 3 kV
U_{a1} = 1.5 kV

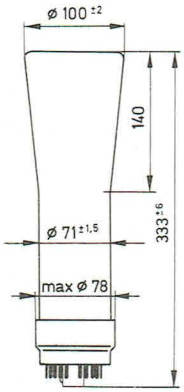
Typical Operation

U_{a3}	=	4 kV
U_{a2}	=	2 kV
U_{a1}	=	200...600 V
$-U_{g1\ cut\ off}$	=	45...95 V
d_{12}	=	31.5...37.5 V/cm
d_{34}	=	26.5...31.5 V/cm

Accessories

Socket: VST 7
Metallic Shield: ART-K541 for Type D. 18-116, ART-K542 for Type D. 18-116/01, ART-K542Z for Type D. 18-116/02
Post-Deflection Accelerator Terminal: VST-K005

with flat faceplate, for medium operating voltages



Application

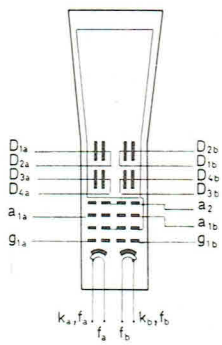
in small size double trace oscilloscopes for industrial and medical purposes

Screen Types

DBM 10-111
DGM 10-111
DNM 10-111

System Structure

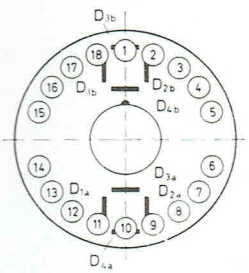
Arrangement of Electrodes:



Base Connections

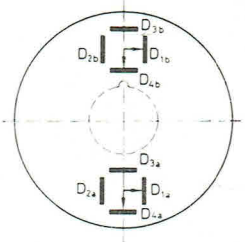
(bottom view)

1 — a_2
2 — D_{1b}
3 — D_{2b}
4 — D_{4b}
5 — D_{3b}
6 — D_{4a}
7 — D_{3a}
8 — D_{2a}
9 — D_{1a}
10 — i. c.
11 — a_{1a}
12 — f_a, k_a
13 — g_{1a}
14 — f_a
15 — f_b, k_b
16 — g_{1b}
17 — f_b
18 — a_{1b}



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 18-pin

Minimum Useful Screen Diameter

80 mm

Heating

U_f = 6.3 V
I_f = 2 × 300 mA

Maximum Ratings

(each system)

U_{a2} = 2.5 kV
U_{a1} = 1.1 kV

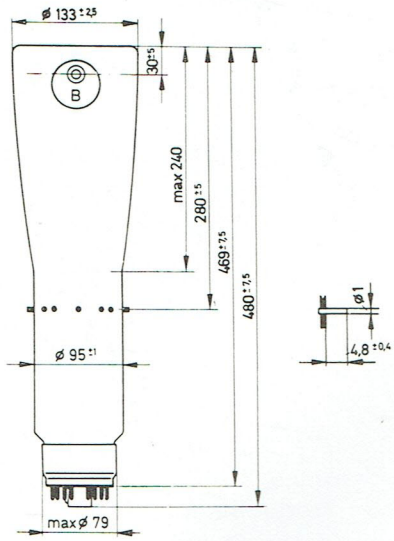
Typical Operation

(each system)

U_{a2} = 2 kV
U_{a1} = 340 . . . 640 V
$-U_{g1\ cut\ off}$ = 30 . . . 90 V
d_{12} = 41 V/cm
d_{34} = 40 V/cm

Accessories

Socket: VST 3
Metallic Shield: ART-K004



of high deflection sensitivity, with flat faceplate, spiral post-deflection accelerator and small capacitance deflection plates with side contacts, for medium operating voltages

Application

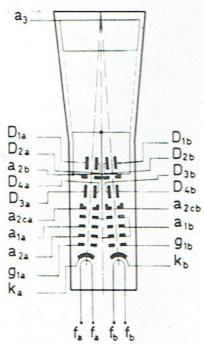
in broad-band oscilloscopes for observing very high speed non-recurring phenomena

Screen Types

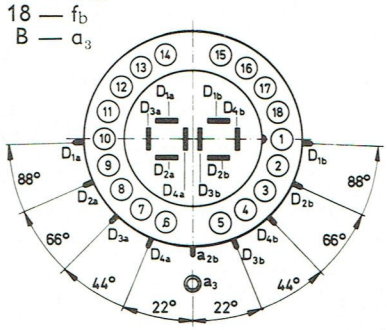
DBM 13-136
DGM 13-136
DNM 13-136
DPM 13-136

System Structure and Base Connections (bottom view)

Arrangement of Electrodes:

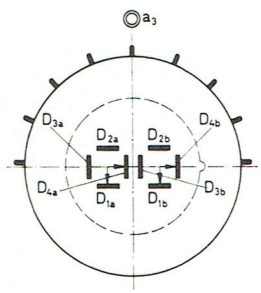


1 — k_b
2 — f_b
3 — i. c.
4 — a_{2a}
5 — i. c.
6 — a_{1a}
7 — g_{1a}
8 — i. c.
9 — f_a
10 — k_a
11 — f_a
12 — i. c.
13 — a_{1ca}
14 — a_{2cb}
15 — a_{1b}
16 — g_{1b}
17 — i. c.
18 — f_b
B — a_3



Deflection

(viewed from screen end)



Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base

special, 18-pin

Minimum Useful Deflection at U_{a3} = 4 kV and U_{a2} = 2 kV

in direction D_{12}: 110 mm
in direction D_{34}: 70 mm

Heating

U_f = 6.3 V
I_f = 2 × 300 mA

Maximum Ratings

(each system)

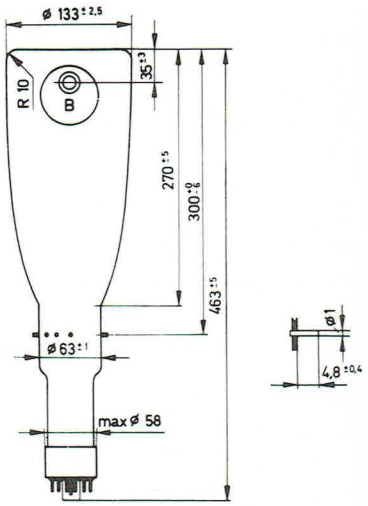
U_{a3} = 8 kV
U_{a2} = 4 kV
U_{a1} = 2 kV

Typical Operation (each system)

U_{a3}	=	4 kV
U_{a2}	=	2 kV
U_{a1}	=	360...700 V
$-U_{g1\ cut\ off}$	=	30...90 V
d_{12}	=	24...28.5 V/cm
d_{34}	=	10...16 V/cm

Accessories

Socket: VST 3
Metallic Shield: ART 9
Post-Deflection Accelerator Terminal: VST-K005
Side Contacts: VST 9 (9 pcs.)



of high deflection sensitivity, with metal-backed screen, spiral post-deflection accelerator, side terminal deflection plates and common horizontal deflection to the two traces, for high operating voltages

Application

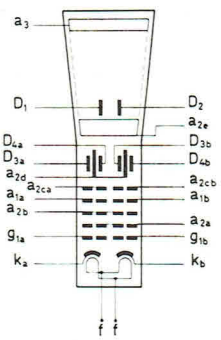
in broad-band oscilloscopes for observing non-recurring phenomena

Screen Types

DBM 13-140
DGM 13-140
DNM 13-140
DPM 13-140

System Structure

Arrangement of Electrodes:



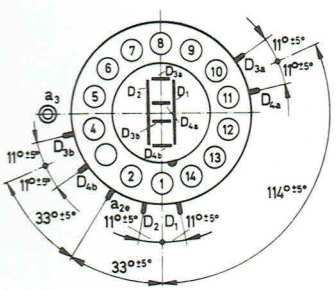
Deflection Method:
electrostatic, symmetrical

Focusing Method:
electrostatic

Base Connections

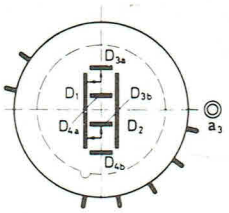
(bottom view)

1 — f
2 — k_b
3 — i. c.
4 — g_{1b}
5 — a_{1b}
6 — a_{2b}
7 — a_{2cb}
8 — a_{2a}
9 — a_{2d}
10 — a_{1a}
11 — g_{1a}
12 — k_a
13 — a_{2ca}
14 — f
B — a_3



Deflection

(viewed from screen end)



Base

Medium Shell Diheptal, 14-pin, JETEC No. B14-38

Minimum Useful Deflection (each system) at $U_{a3}/U_{a2} = 2$

in direction D_{12}: 100 mm
in direction D_{34}: 40 mm
the common useful display area: 100 mm × 20 mm

Heating

U_f = 6.3 V
I_f = 1.2 A

Maximum Ratings

(each system)

U_{a3} = 12 kV
U_{a2a} = 2.1 kV
U_{a1} = 1.5 kV

Typical Operation (each system)

U_{a3}	=	10 kV
U_{a2a}	=	1.67 kV
U_{a1}	=	180...570 V
$-U_{g1\ cut\ off}$	=	50...80 V
d_{12}	=	27...33.5 V/cm
d_{34}	=	5.35...7.2 V/cm

Accessories

Socket: VST 4 or VST 6
Metallic Shield: ART 8
Post-Deflection Accelerator Terminal: VST-K005
Side Contacts: VST 9 (7 pcs.)

with electrostatic focusing, 90° magnetic deflection, small neck diameter, low filament input power and metal-backed grey glass faceplate, no ion-trap, for use without safety plate, suitable for push-through technique (with internal graticules if required)

Application

with W-screen: in monitor-television sets; with GH-, GL-, GM-, GR-, LD- or LF-screen: in industrial display units

Screen Types

K 36-20 GH
K 36-20 GL
K 36-20 GM
K 36-20 GR
K 36-20 LD
K 36-20 LF
K 36-20 W

Minimum Useful Display Area: 211 mm × 270 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 90°
Focusing Method: electrostatic
Beam Centring: magnetic
magnetic field intensity perpendicular to tube axis: 0...10 Oe

Base: miniature, with exhaust connection (JEDEC No. E7-91)

Cavity contact: JEDEC No. J1-21

Heating

U_f = 11 V
I_f = 68 mA

Maximum Ratings

U_a = 16 kV
U_{g2} = 350 V
U_{g4} = 500 V

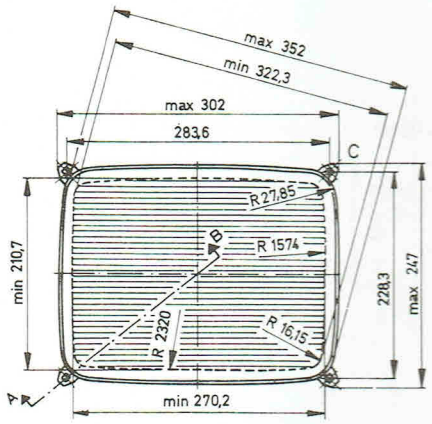
Typical Operation

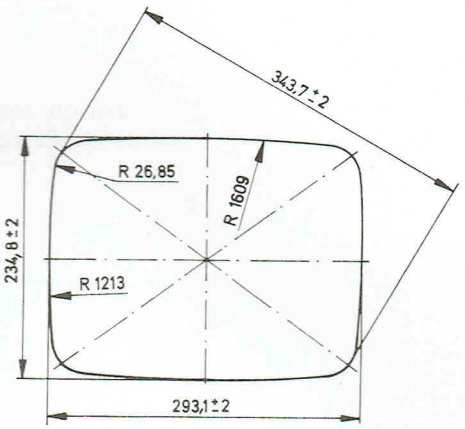
at grid control

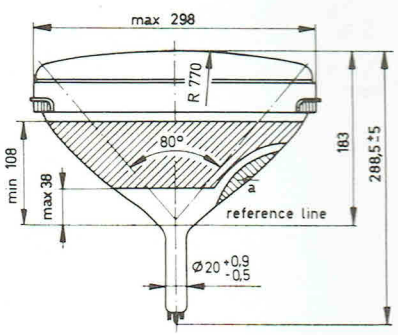
U_a	=	14 kV
U_{g2}	=	350 V
U_{g4}	=	0...350 V
$-U_{g1\ cut\ off}$	=	47...92 V

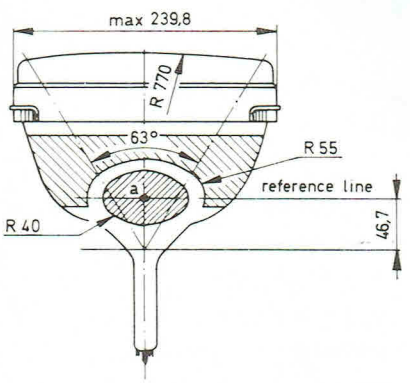
at cathode control

U_a	=	14 kV
U_{g2}	=	200...350 V
U_{g4}	=	0...350 V
U_k	=	approx. 48 V

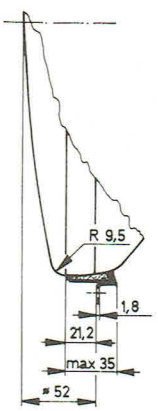


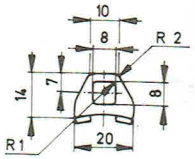


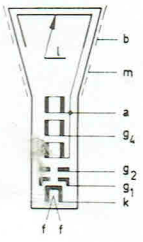


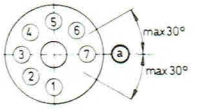


Section A-B Detail C









1 — g_1
2 — k
3 — f
4 — f
5 — g_1
6 — g_2
7 — g_4

with electrostatic focusing, 90° magnetic deflection, small neck diameter, low filament input power and metal-backed flat faceplate, no ion-trap (with internal graticules if required)

Application

with W-screen: in monitor-television sets and video telephones; with GH-, GL-, GM-, GR-, LD- or LF-screen: in industrial display units

Screen Types

K 2001 GH
K 2001 GL
K 2001 GM
K 2001 GR
K 2001 LD
K 2001 LF
K 2001 W

Minimum Useful Display Area: 130 mm × 150 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 90°
Focusing Method: electrostatic
Beam Centring: magnetic

Base: miniature, with exhaust connection (JEDEC No. E7-91)

Cavity contact: JEDEC No. J1-21

Heating

U_f = 11 V
I_f = 68 mA

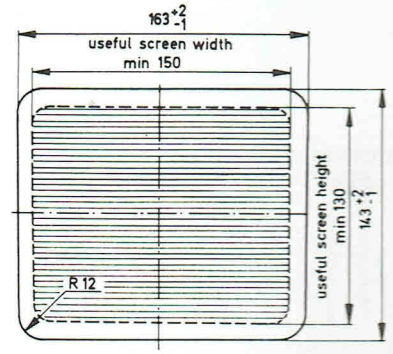
Maximum Ratings

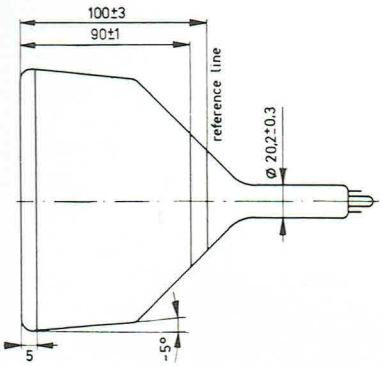
U_a = 15 kV
U_{g2} = 450 V
U_{g4} = 450 V

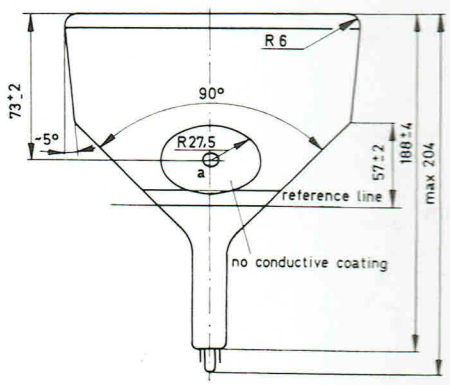
Typical Operation

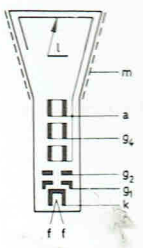
at cathode control

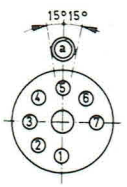
U_a = 14 kV
U_{g2} = 200 . . . 350 V
U_{g4} = 0 . . . 400 V
$U_{k\ cut\ off}$ = 30 . . . 70 V











1 — g_1
2 — k
3 — f
4 — f
5 — i.c.
6 — g_2
7 — g_4

with electrostatic focusing, 55° magnetic deflection, small neck diameter, low filament input power, metal-backed faceplate, no ion-trap (with internal graticules if required). Tentative data.

Application

with W-screen: in monitor-television sets and as camera-monitor tube; with GH-, GL-, GM-, GR-, LD- or LF-screen: in industrial display units

Screen Types

M 12-100 GH
M 12-100 GL
M 12-100 GM
M 12-100 GR
M 12-100 LD
M 12-100 LF
M 12-100 W

Minimum Useful Display Area: 70 mm × 90 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 55°
Focusing Method: electrostatic
Beam Centring: magnetic

Base: miniature, with exhaust connection (JEDEC No. E7-91)

Cavity contact: JEDEC No. J1-30

Heating

U_f = 11 V
I_f = 68 mA

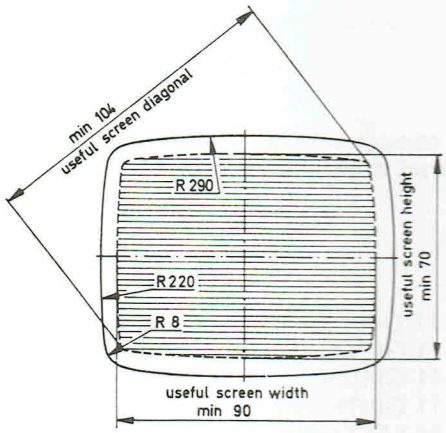
Maximum Ratings

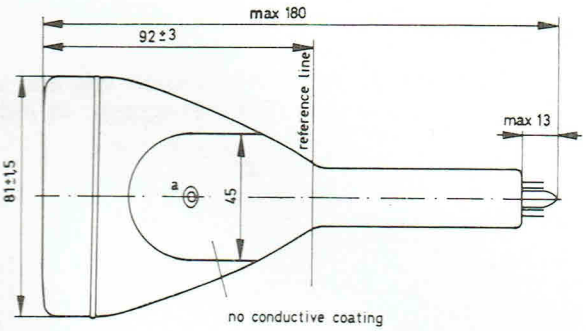
U_a = 10 kV
U_{g2} = 450 V
U_{g4} = 1.1 kV

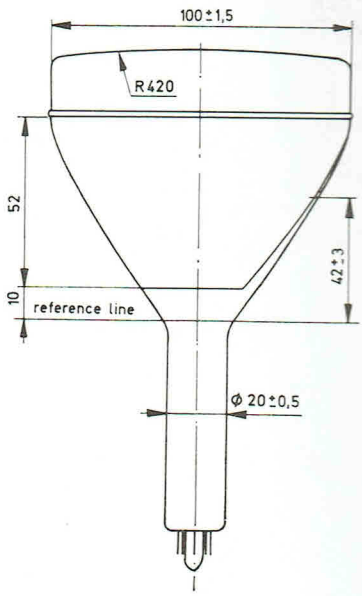
Typical Operation

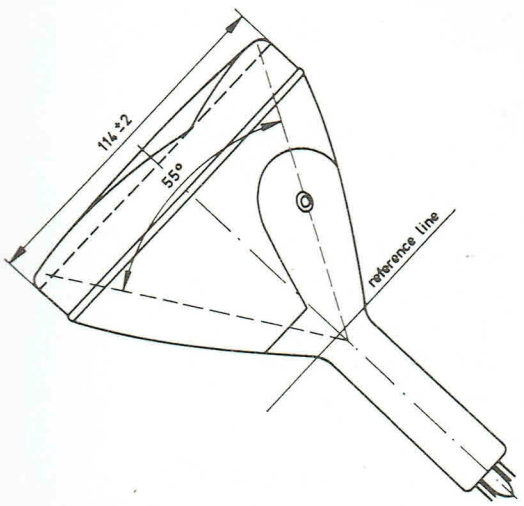
at grid control

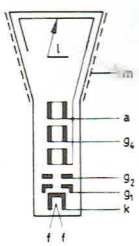
U_a	=	8 kV
U_{g2}	=	300 V
U_{g4}	=	—50 . . . 300 V
$-U_{g1\ cut\ off}$	=	25 . . . 50 V



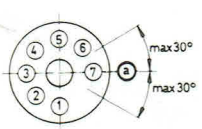








1 — g_1
2 — k
3 — f
4 — f
5 — g_1
6 — g_2
7 — g_4



with electrostatic focusing, 75° magnetic deflection, small neck diameter, low filament input power and metal-backed flat faceplate, no ion-trap (with internal graticules if required), Types M 17-111 ../T and M 17-111 ../TK with holding frame

Application

with W-screen: in monitor-television sets and as camera-monitor-tubes; with GH-, GL-, GM-, GR-, LD-, LF- or P22R/P31-screen: in industrial display units

Screen Types

M 17-11 GH	M 17-111 GH/T	M 17-111 GH/TK
M 17-11 GL	M 17-111 GL/T	M 17-111 GL/TK
M 17-11 GM	M 17-111 GM/T	M 17-111 GM/TK
M 17-11 GR	M 17-111 GR/T	M 17-111 GR/TK
M 17-11 LD	M 17-111 LD/T	M 17-111 LD/TK
M 17-11 LF	M 17-111 LF/T	M 17-111 LF/TK
M 17-11 P22R/P31	M 17-111 P22R/P31/T	M 17-111 P22R/P31/TK
M 17-11 W	M 17-111 W/T	M 17-111 W/TK

Minimum Useful Display Area: 95 mm × 125 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 75°
Focusing Method: electrostatic
Beam Centring: magnetic

Base: miniature, with exhaust connection (JEDEC No. E7-91)

Cavity contact: JEDEC No. J1-21

Heating

U_f = 11 V
I_f = 68 mA

Maximum Ratings

U_a = 14 kV
U_{g2} = 350 V
U_{g4} = 500 V

Typical Operation

at grid control

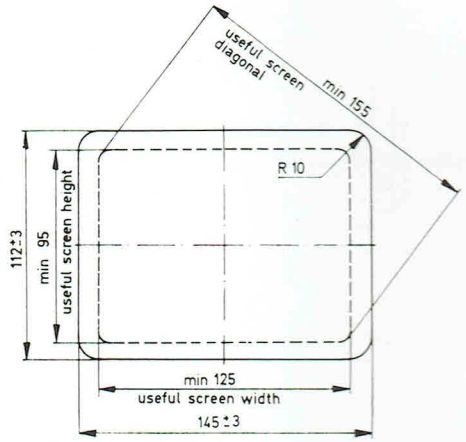
U_a	=	13 kV
U_{g2}	=	350 V
U_{g4}	=	50...400 V
$-U_{g1\ cut\ off}$	=	46....91 V

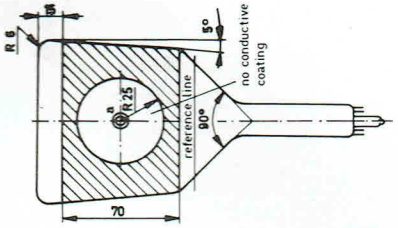
at cathode control

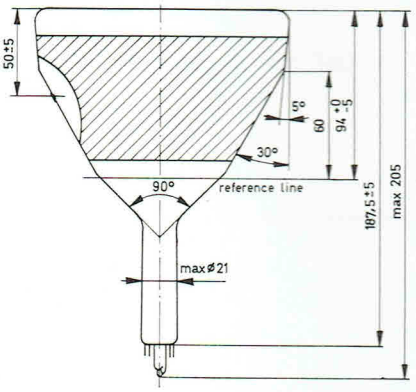
U_a	=	13 kV
U_{g2}	=	200...350 V
U_{g4}	=	50...400 V
U_k	=	approx. 47 V

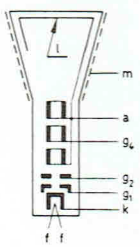
The three with the naked eye distinguishable shades on the P 22R/P31-screen are:

U_a = 5... 6 kV: red
U_a = 9.5...11 kV: yellow
U_a = 13...14 kV: yellowish green

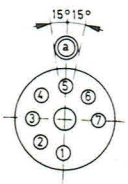




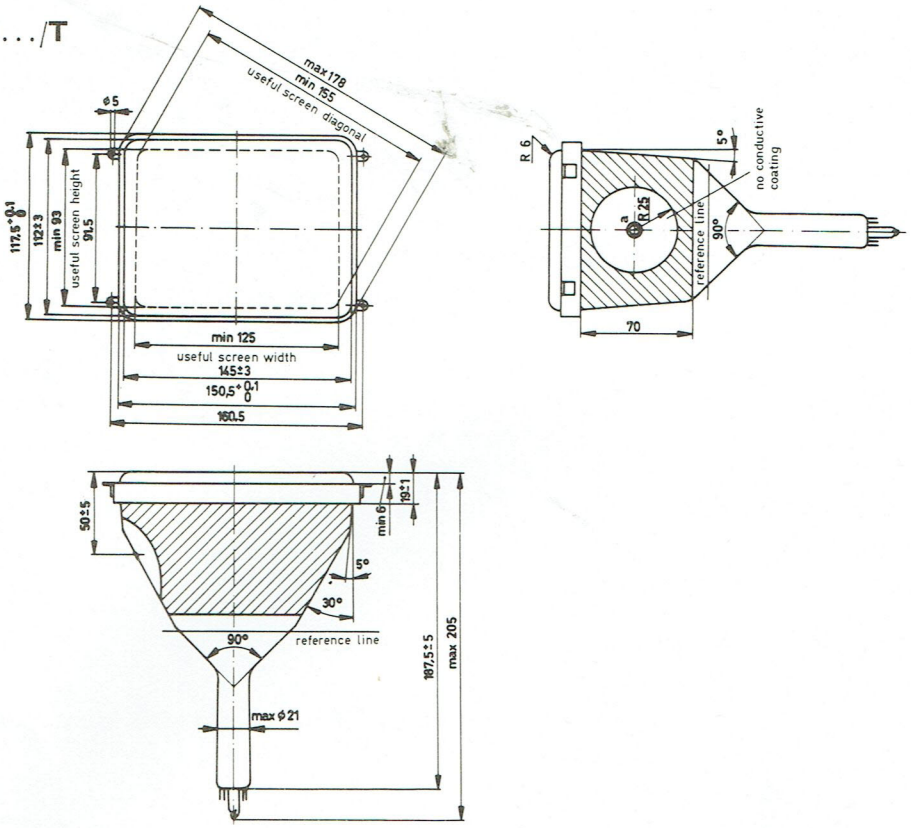




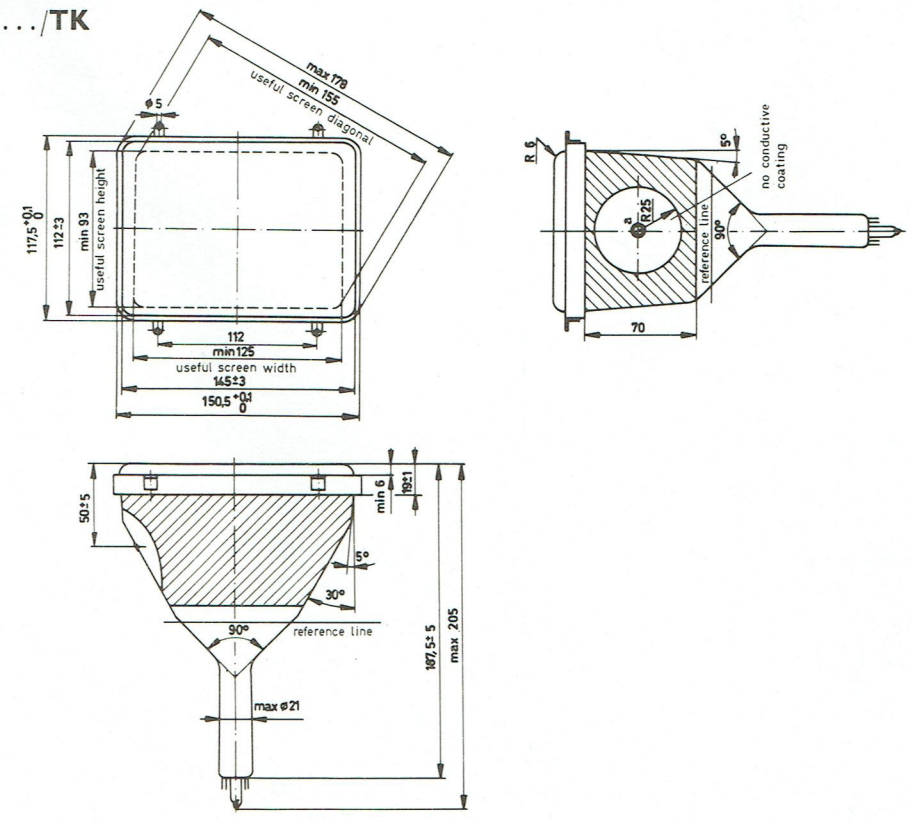
1 — g_1
2 — k
3 — f
4 — f
5 — g_1
6 — g_2
7 — g_4



M 17-111.../T



M 17-111.../TK



with electrostatic focusing, 90° magnetic deflection, small neck diameter, low filament input power, metal-backed grey glass faceplate and rimband-reinforced envelope with integral mounting leaks[1], suitable for push-through technique (with internal graticules if required). Tentative data.

Application

with W-screen: in monitor-television sets; with GH-, GL-, GM-, GR-, LD- or LF-screen: in industrial display devices

Screen Types

M 23-100 GH
M 23-100 GL
M 23-100 GM
M 23-100 GR
M 23-100 LD
M 23-100 LF
M 23-100 W

Minimum Useful Display Area: 140 mm × 183 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 90°
Focusing Method: electrostatic
Beam Centring: magnetic

Base: miniature, with exhaust connection (JEDEC No. E7-91)

Cavity contact: JEDEC No. J1-21

Heating

U_f = 11 V
I_f = 68 mA

Maximum Ratings

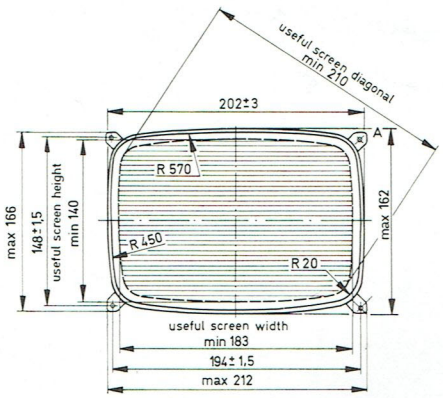
U_a = 12 kV
U_{g2} = 125 V
U_{g4} = 1.1 kV

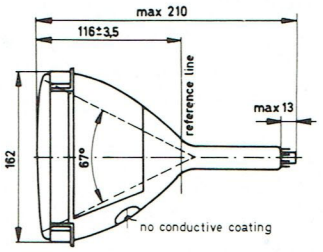
Typical Operation

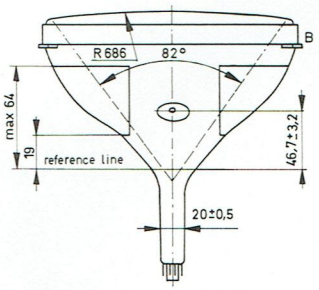
at grid control

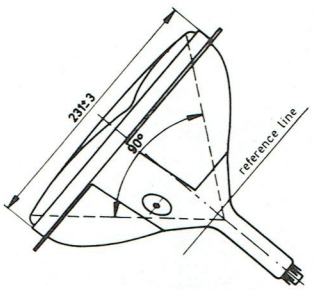
U_a	=	9 kV
U_{g2}	=	100 V
U_{g4}	=	−50...300 V
$-U_{g1\ cut\ off}$	=	32...50 V

[1] The tube can be applied without safety plate and fixed at the metal rimband.



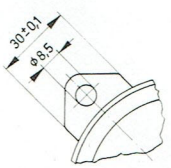


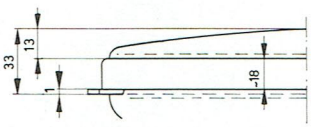


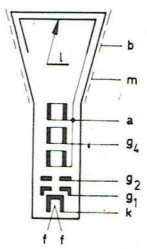


Detail A

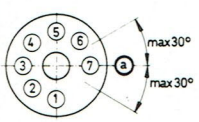
Detail B







1 — g_1
2 — k
3 — f
4 — f
5 — g_1
6 — g_2
7 — g_4



with electrostatic focusing, 90° magnetic deflection, small neck diameter, low filament input power and metal-backed grey glass faceplate, no ion-trap, for use without safety plate, suitable for push-through technique (with internal graticules if required)

Application

with W-screen: in monitor-television sets; with GH-, GL-, GM-, GR-, LD-, LF- or P22R/P31-screen: in industrial display units

Screen Types

M 28-12 GH
M 28-12 GL
M 28-12 GM
M 28-12 GR
M 28-12 LD
M 28-12 LF
M 28-12 P22R/P31
M 28-12 W

Minimum Useful Display Area: 171 mm × 228 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 90°
Focusing Method: electrostatic
Beam Centring: magnetic
magnetic field intensity perpendicular to tube axis: 0...10 Oe

Base: miniature, with exhaust connection (JEDEC No. E7-91)

Cavity contact: JEDEC No. J1-21

Heating

U_f = 11 V
I_f = 68 mA

Maximum Ratings

U_a = 14 kV
U_{g2} = 350 V
U_{g4} = 500 V

Typical Operation

at grid control

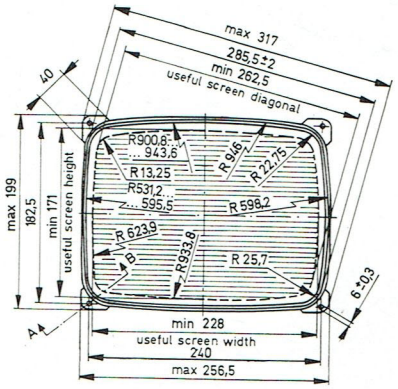
U_a	=	13 kV
U_{g2}	=	350 V
U_{g4}	=	50...400 V
$-U_{g1\ cut\ off}$	=	46... 91 V

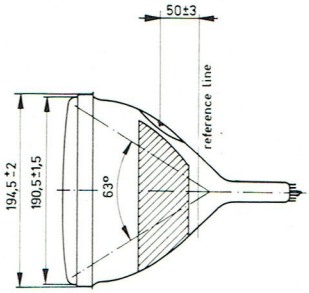
at cathode control

U_a	=	13 kV
U_{g2}	=	200...350 V
U_{g4}	=	50...400 V
U_k	=	approx. 47 V

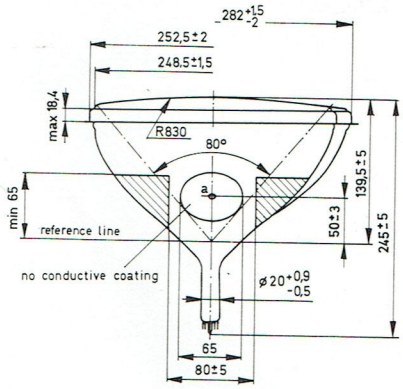
The three with the naked eye distinguishable shades on the P22R/P31-screen are:

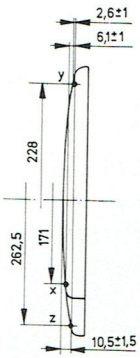
U_a = 5... 6 kV: red
U_a = 9.5...11 kV: yellow
U_a = 13...14 kV: yellowish green



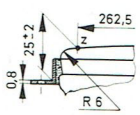


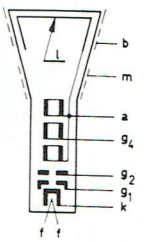
Spherical faceplate



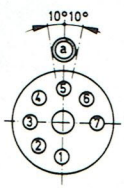


Section A-B





1 — g_1
2 — k
3 — f
4 — f
5 — g_1
6 — g_2
7 — g_4



with electrostatic focusing, 110° magnetic deflection, metal-backed grey glass faceplate and rimband-reinforced envelope with integral mounting leaks[1], suitable for push-through technique (with internal graticules if required). Tentative data.

Application

with W-screen; in monitor-television sets; with GH-, GL-, GM-, GR-, LD- or LF-screen: in industrial display units

Screen Types

M 31-120 GH
M 31-120 GL
M 31-120 GM
M 31-120 GR
M 31-120 LD
M 31-120 LF
M 31-120 W

Minimum Useful Display Area: 195 mm × 257 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 110°
Focusing Method: electrostatic
Beam Centring: magnetic
magnetic field intensity perpendicular to tube axis: 0...10 Oe

Base: miniature, with exhaust connection (JEDEC No. E7-91)

Cavity contact: JEDEC No. J1-21

Heating

U_f = 11 V
I_f = 68 mA

Maximum Ratings

U_a = 12 kV
U_{g2} = 350 V
U_{g4} = 500 V

Typical Operation

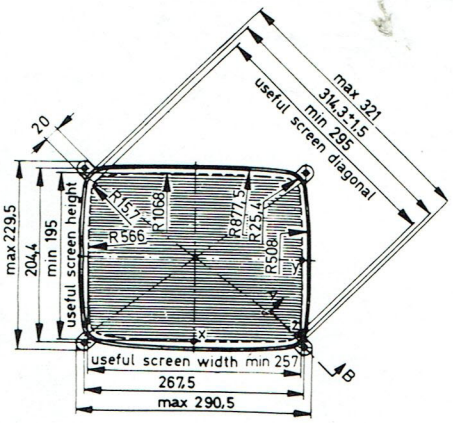
at grid control

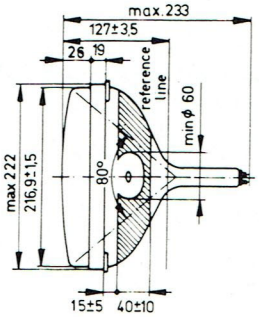
U_a	=	11 kV
U_{g2}	=	250 V
U_{g4}	=	0...350 V
$-U_{g1\ cut\ off}$	=	35...69 V

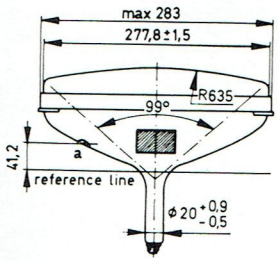
at cathode control

U_a	=	11 kV
U_{g2}	=	250 V
U_{g4}	=	0...350 V
U_k	=	32...58 V

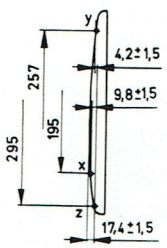
[1] The tube can be applied without safety plate and fixed at the metal rimband.



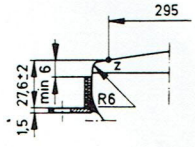


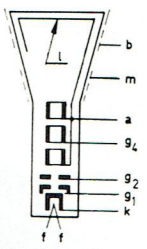


Spherical faceplate

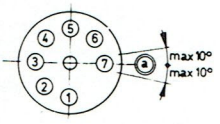


Section A-B





1 — g_1
2 — k
3 — f
4 — f
5 — g_1
6 — g_2
7 — g_4



with electrostatic focusing, 110° magnetic deflection and metal-backed grey glass faceplate (with internal graticules if required)

Application

with W-screen: in monitor-television sets; with GH-, GL-, GM-, GR-, LD- or LF-screen: in industrial display units

Screen Types

M 38-120 GH
M 38-120 GL
M 38-120 GM
M 38-120 GR
M 38-120 LD
M 38-120 LF
M 38-120 W

Minimum Useful Display Area: 226 mm × 291 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 110°
Focusing Method: electrostatic
Beam Centring: magnetic
magnetic field intensity perpendicular to tube axis: 0...10 Oe

Base: neoeightar (JEDEC No. B7-208)

Cavity contact: JEDEC No. J1-21

Heating

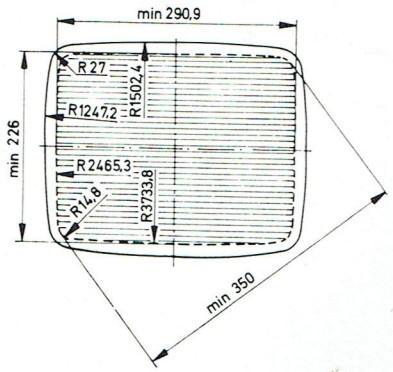
U_f = 6.3 V
I_f = 300 mA

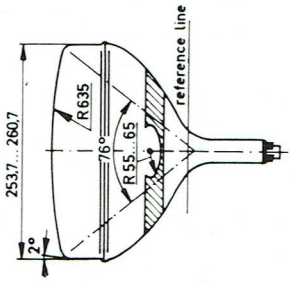
Maximum Ratings

U_a = 18 kV
U_{g2} = 550 V
U_{g4} = 1 kV

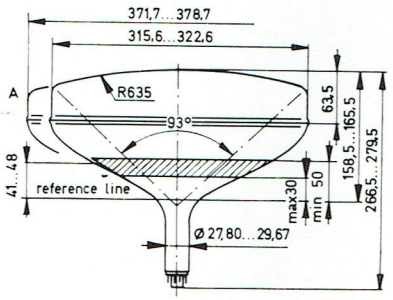
Typical Operation

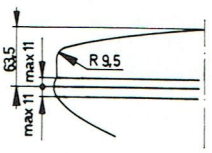
U_a	=	16 kV
U_{g2}	=	400 V
U_{g4}	=	0...400 V
$-U_{g1\ cut\ off}$	=	40...85 V
resolution	=	min 625 lines

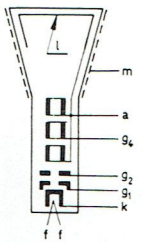




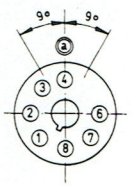
Detail A







1 — f
2 — g_1
3 — g_2
4 — g_4
6 — g_1
7 — k
8 — f



with electrostatic focusing, 110° magnetic deflection and metal-backed grey glass faceplate, for use without safety plate (with internal graticules if required)

Application

with W-screen: in monitor-television sets; with GH-, GL-, GM-, GR-, LD- or LF-screen in industrial display units

Screen Types

M 47-12 GH
M 47-12 GL
M 47-12 GM
M 47-12 GR
M 47-12 LD
M 47-12 LF
M 47-12 W

Minimum Useful Display Area: 305 mm × 348 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 110°
Focusing Method: electrostatic
Beam Centring: magnetic
magnetic field intensity perpendicular to tube axis: 0...6.5 Oe

Base: neoeightar (JEDEC No. B7-208)

Cavity contact: JEDEC No. J1-21

Heating

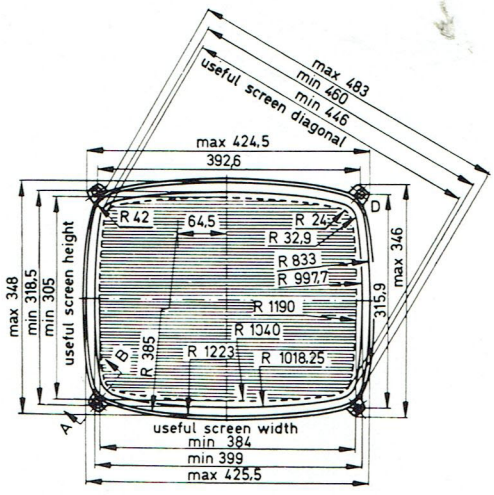
U_f = 6.3 V
I_f = 300 mA

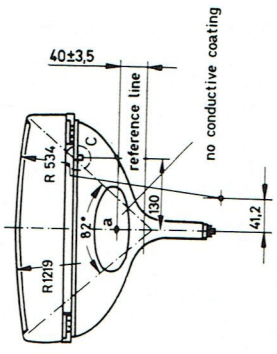
Maximum Ratings

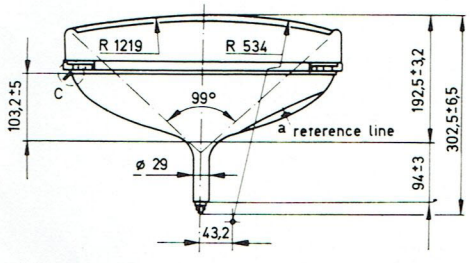
U_a = 18 kV
U_{g2} = 550 V
U_{g4} = 1 kV

Typical Operation

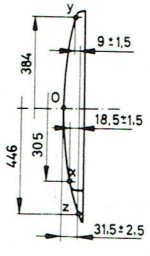
U_a	=	18 kV
U_{g2}	=	500 V
U_{g4}	=	0...400 V
$-U_{g1\ cut\ off}$	=	50...93 V



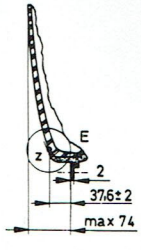




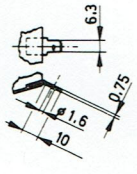
Spherical faceplate



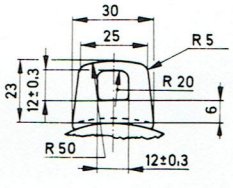
Section A-B



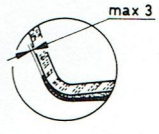
Detail C

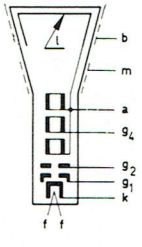


Detail D

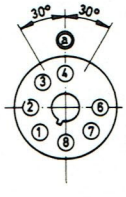


Detail E





1 — f
2 — g_1
3 — g_2
4 — g_4
6 — g_1
7 — K
8 — f



with electrostatic focusing, 110° magnetic deflection and metal-backed grey glass faceplate, no ion-trap, for use without safety plate (with internal graticules if required)

Application

with W-screen; in monitor-television sets; with GH-, GL-, GM-, GR-, LD- or LF-screen: in industrial display units

Screen Types

M 59-33 GH
M 59-33 GL
M 59-33 GM
M 59-33 GR
M 59-33 LD
M 59-33 LF
M 59-33 W

Minimum Useful Display Area: 385 mm × 489 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 110°
Focusing Method: electrostatic
Beam Centring: magnetic
magnetic field intensity perpendicular to tube axis: 0...10 Oe

Base: neoeightar (JEDEC No. B7-208)

Cavity contact: JEDEC No. J1-21

Heating

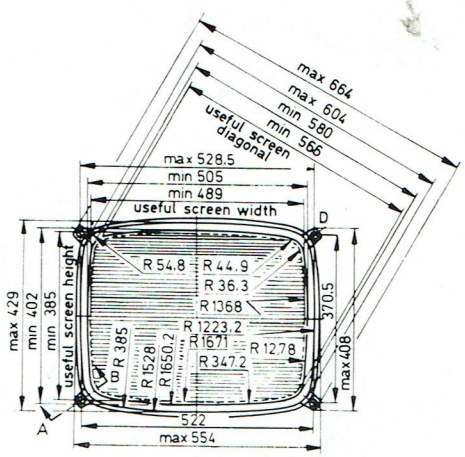
U_f = 6.3 V
I_f = 300 mA

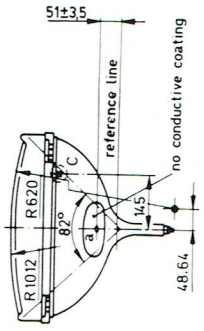
Maximum Ratings

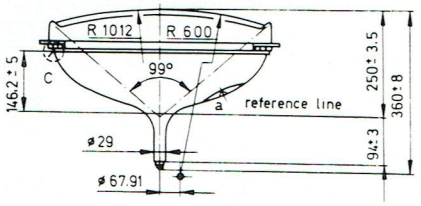
U_a = 18 kV
U_{g2} = 550 V
U_{g4} = 1 kV

Typical Operation

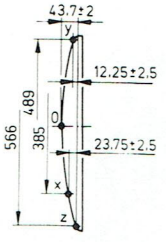
U_a	=	18 kV
U_{g2}	=	500 V
U_{g4}	=	0...400 V
$-U_{g1\ cut\ off}$	=	50...93 V



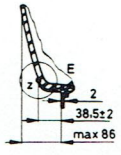




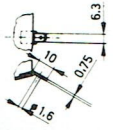
Spherical faceplate



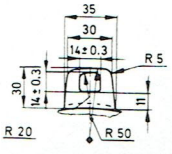
Section A-B



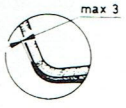
Detail C

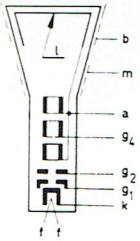


Detail D

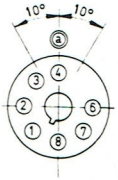


Detail E





1 — f
2 — g_1
3 — g_2
4 — g_4
6 — g_1
7 — k
8 — f



with electrostatic focusing, 70° magnetic deflection, small neck diameter, low filament input power and metal-backed faceplate, no ion-trap (with internal graticules if requested). Types K 2006.. and K 2006../K with fast warm-up cathode. The data of both types are tentative.

Application

with B4- and W-screen; in monitor-television sets and as camera-monitor-tubes; with B2-, B7-, B19-, B31-, B33-, B39-, GH-, GL-, GM-, GR-, LD- or LF-screen: in industrial display units

Screen Types

140 MB2/T	(equal to GL)	K 2006 GH	140 MB7/TK
140 MB4/T	(equal to W)	K 2006 GL	140 MB31/TK
140 MB7/T	(equal to GM)	K 2006 GM	
140 MB19/T	(equal to LF)	K 2006 GR	K 2006 GM/K
140 MB31/T	(equal to GH)	K 2006 LD	K 2006 GH/K
140 MB33/T	(equal to LD)	K 2006 LF	
140 MB39/T	(equal to GR)	K 2006 W	

Minimum Useful Display Area: 85 mm × 110 mm

System Structure

Deflection Method: magnetic
Deflection Angle: 70°
Focusing Method: electrostatic

Base: miniature, with exhaust connection (JEDEC No. E7-91)

Cavity contact: JEDEC No. J1-21

Heating

140 MB./T,
140 MB./TK:
U_f = 11 V
I_f = 68 mA

K 2006..,
K 2006../K:
U_f = 0.5 V
I_f = 800 mA
t_h = 1.5...2 s

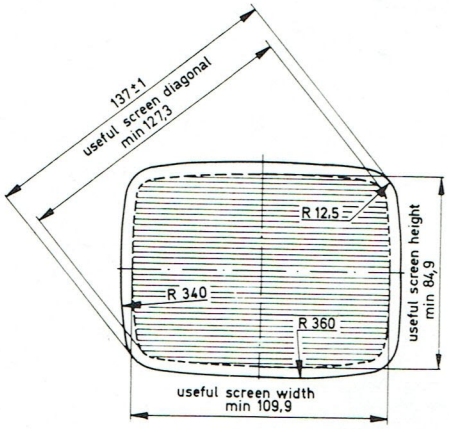
Typical Operation

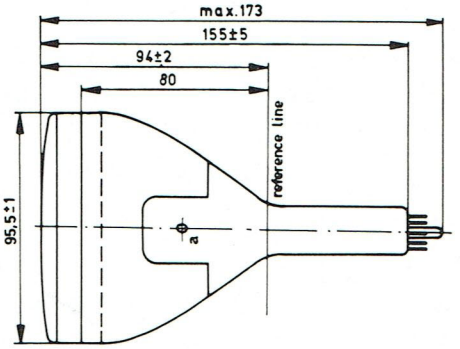
at grid control

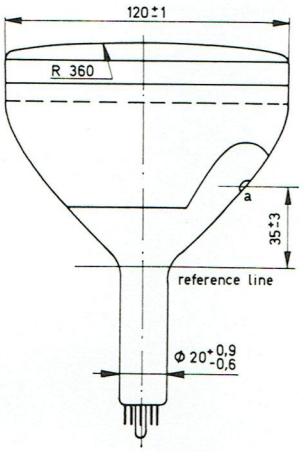
U_a = 8 kV
(140 MB./T, K 2006..)
U_a = 5 kV
(140 MB./TK, K 2006../K)
U_{g2} = 300 V
U_{g4} = 0...300 V
$-U_{g1\ cut\ off}$ = 15...40 V

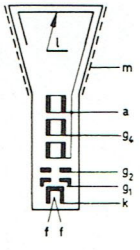
Maximum Ratings

U_a = 10 kV
$U_{a\ min}$ = 7 kV
(140 MB./T, K 2006..)
$U_{a\ min}$ = 4 kV
(140 MB./TK, K 2006../K)
U_{g2} = 450 V
U_{g4} = 1.1 kV

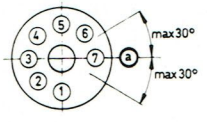


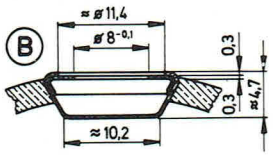




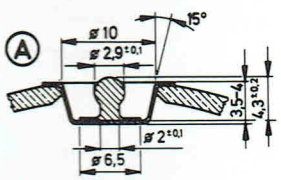


1 — g_1
2 — k
3 — f
4 — f
5 — g_1
6 — g_2
7 — g_4

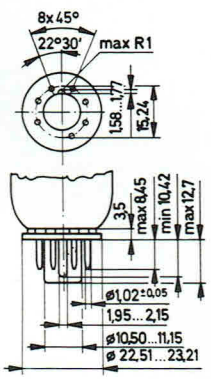




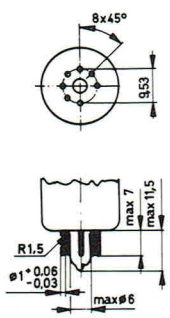
JEDEC No. J1-21



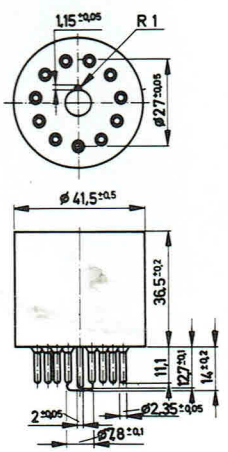
JEDEC No. J1-22



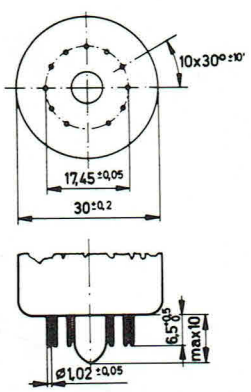
Small-Button Neoeightar,
7-pin
JEDEC No. B7-208



Miniature, 7-pin, with exhaust connection
JEDEC No. E7-91

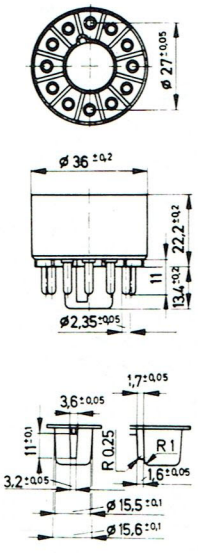


Medium-Shell Magnal,
11-pin
JETEC No. B11-66



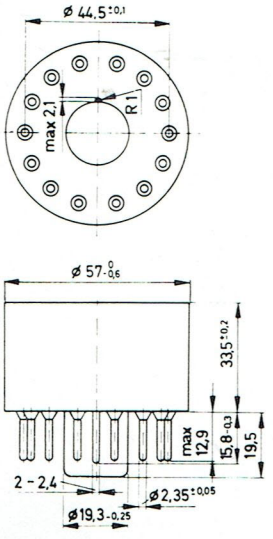
Small-Button Unidecar,
11-pin
JETEC No. E11-22

BASES AND CAVITY CONTACTS



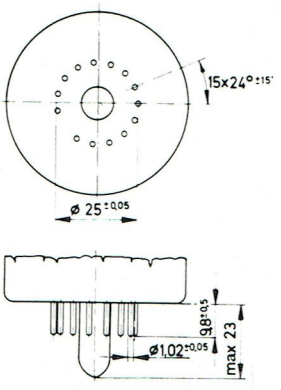
Small-Shell Duodecal,
12-pin
JETEC No. B12-43

10-pin
(without pins 5 and 11):
JETEC No. B10-75

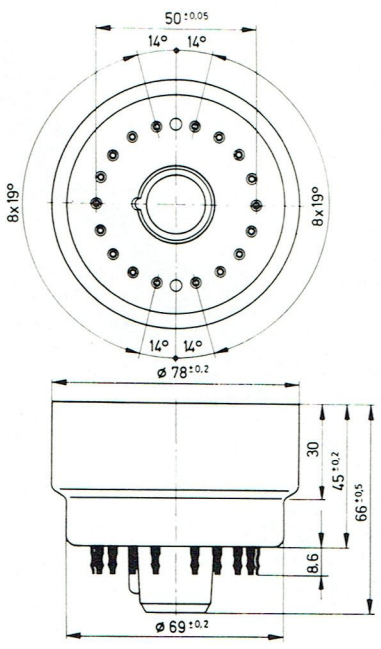


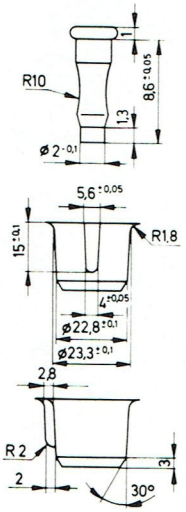
Medium-Shell Diheptal
14-pin: JETEC No. B14-38

12-pin (without pins 6 and
13): JETEC No. B12-37



14-pin Special Base

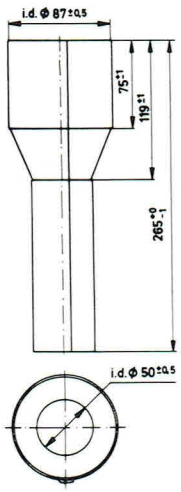




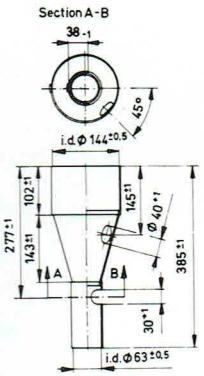
18-pin Special Base

METALLIC SHIELDS, mm

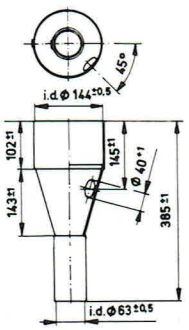
ART-1



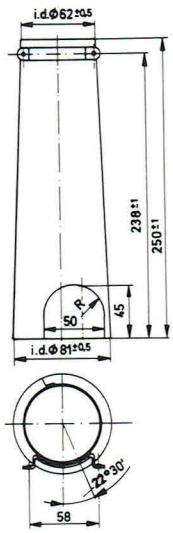
ART-3



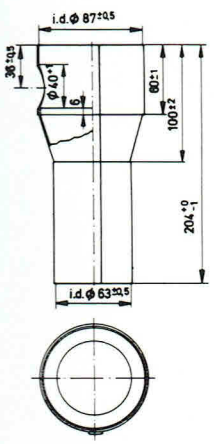
ART-3Z



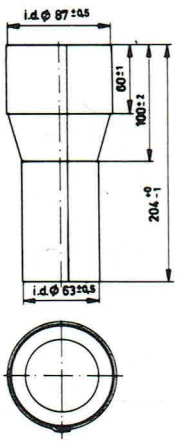
ART-4



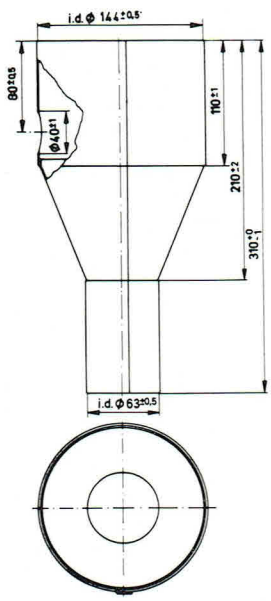
ART-5



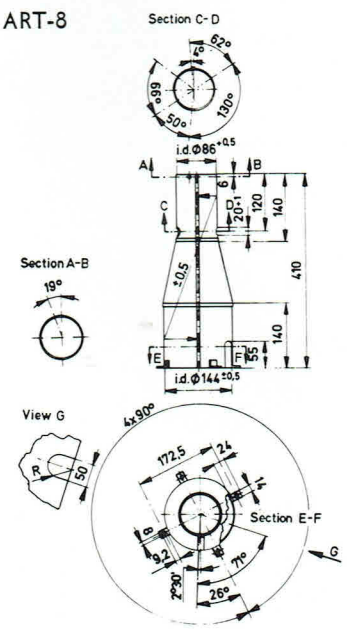
ART-6



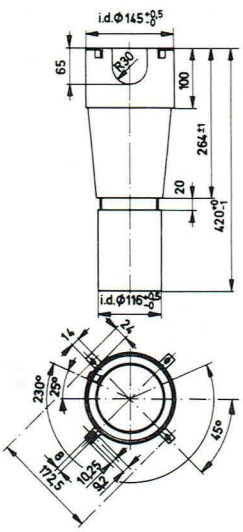
ART-7



ART-8

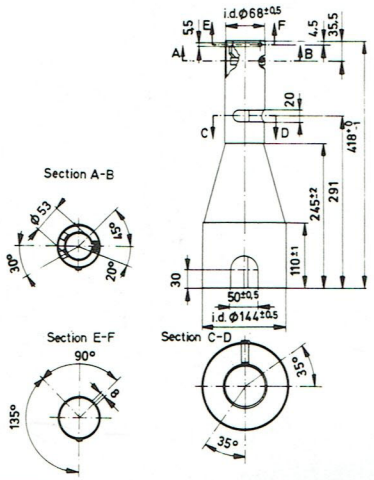


ART-9

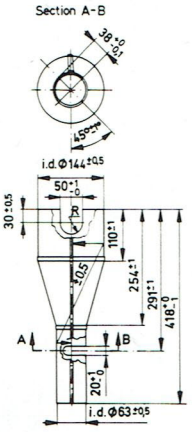


METALLIC SHIELDS, mm

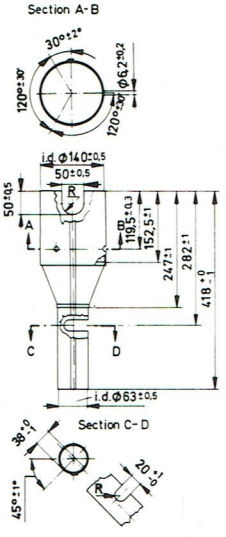
ART-K001



ART-K002

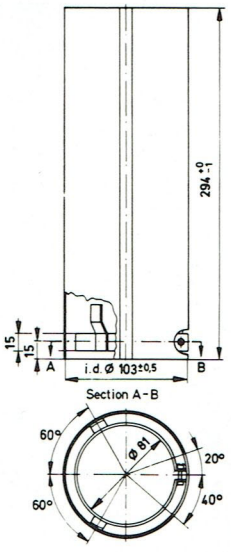


ART-K003

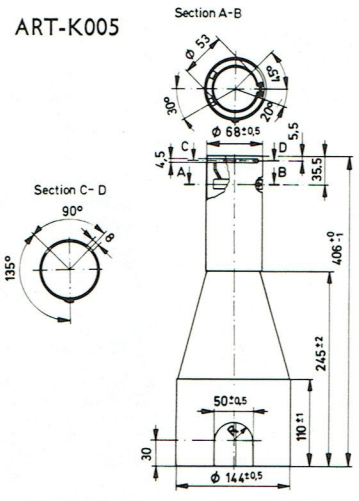


ORION

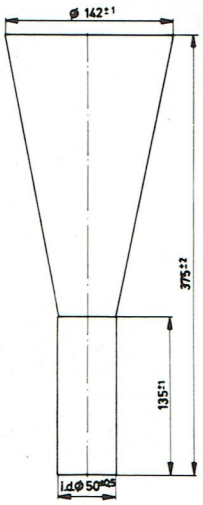
ART-K004



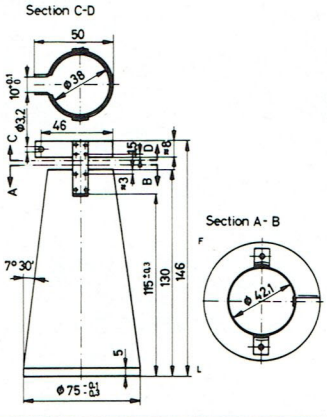
ART-K005



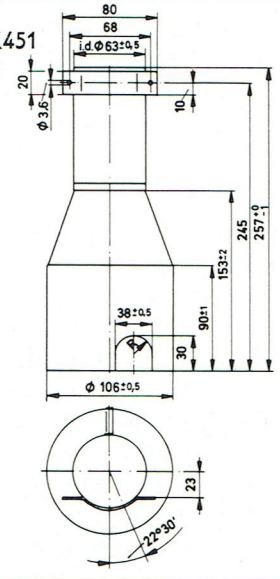
ART-K006



ART-K411

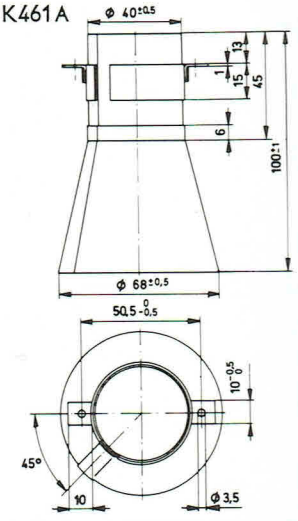


ART-K451

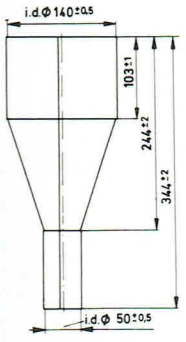


METALLIC SHIELDS, mm

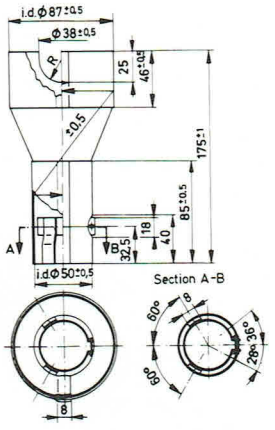
ART-K461A



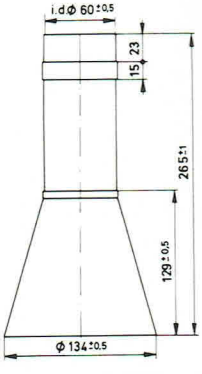
ART-K471



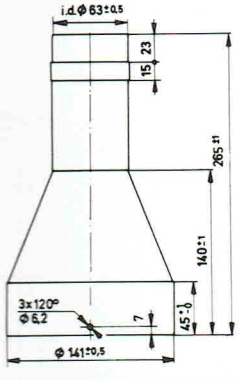
ART-K501A



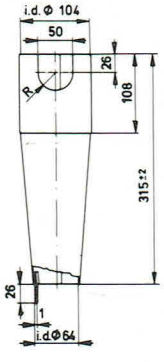
ART-K521A



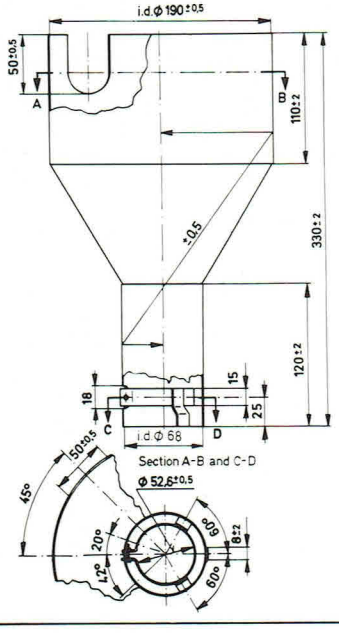
ART-K522A



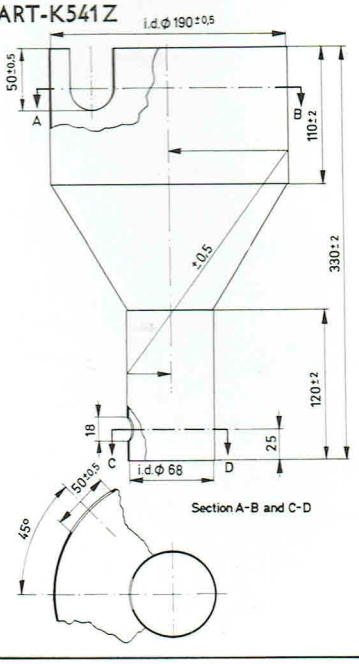
ART-K531



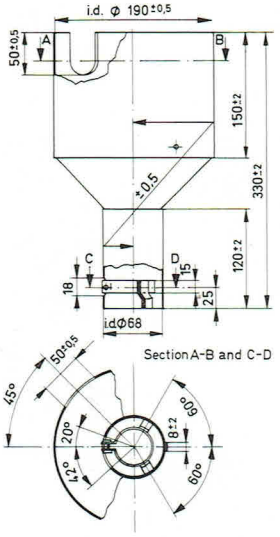
ART-K541



ART-K541Z

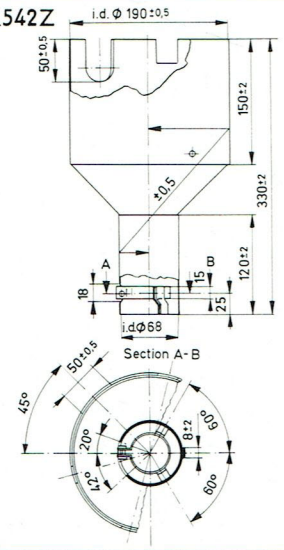


ART-K542

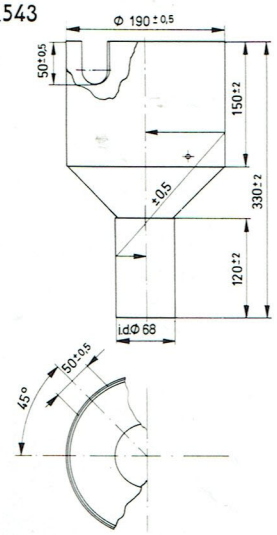


METALLIC SHIELDS, mm

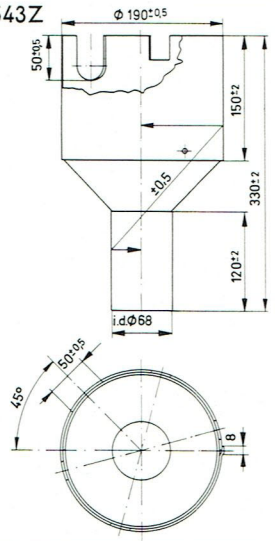
ART-K542Z



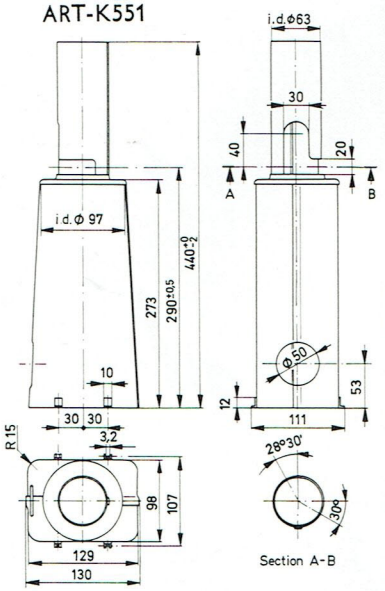
ART-K543



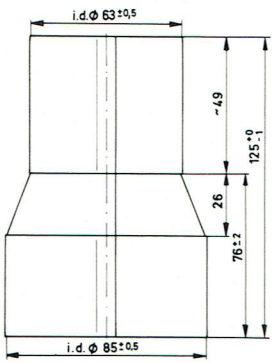
ART-K543Z



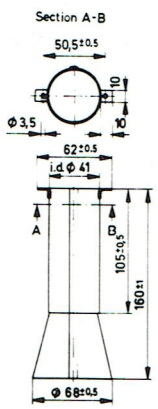
ART-K551



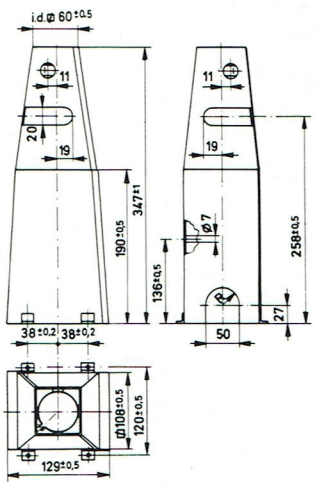
ART-K591Z



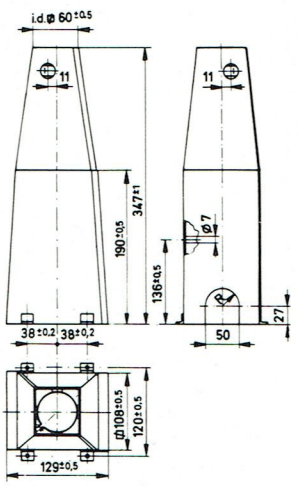
ART-K601



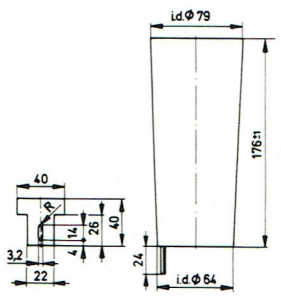
ART-K611



ART-K611Z

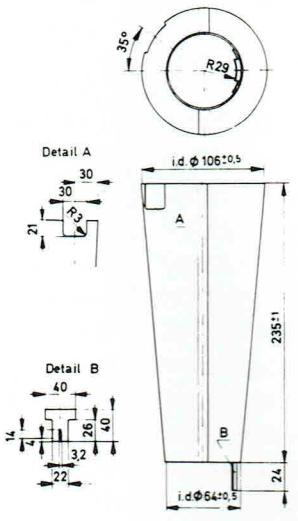


ART-K651

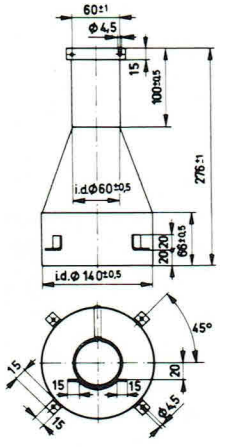


METALLIC SHIELDS, mm

ART-K661



ART-K671



ORION

INTERCHANGEABILITY LIST

The oscilloscope and monitor tubes in this interchangeability list are not identical, but owing to their similarity they are interchangeable in almost every circuit.

type to be replaced	ORION type	type to be replaced	ORION type	type to be replaced	ORION type
B7S4	DH 7-178	D 13-26 GP	D 13-26 GL	DN 13-2	DN 13-116
B7S4N	DN 7-178	D 13-27 GH	D 13-27 GH	DN 13-14	DN 13-114
B10S21[1]	DGM 10-111	D 13-450 GH/01	D 13-450 GH/01	DN 13-32	DN 13-132
B10S21B[1]	DBM 10-111	D 14-180 GH[4]	D 14-180 GH/T	DN 13-34	DN 13-134
B10S21N[1]	DNM 10-111	D 18-140 GH[2]	DH 18-114	DN 13-54	DN 13-154
B13S5[1]	DG 13-154	D 18-140 GJ[2]	DG 18-114	DN 13-58[2]	D 13-21 GL
B13S5B[1]	DB 13-154	D 18-140 GH[2]	DP 18-114	DN 13-78[2]	D 13-21 GL
B13S5DN[1]	DP 13-154	D 18-141 GH[2]	DH 18-116	DN 13-79	D 13-21 GL
B13S5N[1]	DN 13-154	D 18-141 GJ[2]	DG 18-116	DP 7-14[3]	DP 7-116 F
B13S6[1]	DG 13-114	D 18-141 GH[2]	DP 18-116	DP 7-78	DP 7-178
B13S6DN[1]	DP 13-114	DB 7-14[3]	DB 7-116 F	DP 13-2	DP 13-116
B13S6N[1]	DN 13-114	DB 7-78	DB 7-178	DP 13-14	DP 13-114
B13S7[2]	D 13-21 GH	DB 13-2	DB 13-116	DP 13-32	DP 13-132
B13S7N[2]	D 13-21 GL	DB 13-14	DB 13-114	DP 13-34	DP 13-134
B13S7DN[2]	D 13-21 GM	DB 13-32	DB 13-132	DP 13-54	DP 13-154
B13S8[1]	D 13-26 GH	DB 13-34	DB 13-134	DP 18-14[2]	DP 18-114
B13S8A[1]	D 13-26 GL	DB 13-54	DB 13-154	F8074P1	DGM 13-140
B13S25[1]	DGM 13-116	DB 13-58[2]	D 13-21 BE	F8074P2	DNM 13-140
B13S25DN[1]	DPM 13-136	DB 13-78[2]	D 13-21 BE	F8074P11	DBM 13-140
B13S25N[1]	DNM 13-136	DB 13-79	D 13-21 BE	M 17-11 LF	M 17-11 LF
B13S52	DG 13-154	DG 7-14[3]	DG 7-116 F	M 17-18 W	M 17-11 W
B13S52DN	DP 13-153	DG 7-31	DG 7-131	M 28-10 GL[2]	M 28-12 GL
B13S52N	DN 13-154	DG 7-32	DG 7-132	M 28-12 GL[2]	M 28-12 GL
D 7-190 GH	D 7-190 GH/T	DG 13-2	DG 13-116	M 28-10 GM	M 28-12 GM
D 10-12 BE	D 10-12 BE	DG 13-14	DG 13-114	M 28-12 GM[2]	M 28-12 GM
D 10-12 GH	D 10-12 GH	DG 13-32	DG 13-132	M 47-12 GM	M 47-12 GM
D 10-12 GL	D 10-12 GL	DG 13-34	DG 13-134	M 47-12 LF	M 47-12 LF
D 10-12 GM	D 10-12 GM	DG 13-54	DG 13-154	M 47-25..[1]	M 47-12..
D 10-160 GH	D 10-160 GH/T	DG 13-58[2]	D 13-21 GH	M 59-25..[1]	M 59-33..
D 13-21 BE	D 13-21 BE	DG 18-14 A[2]	DG 18-114	M 59-33 GM	M 59-33 GM
D 13-21 BG	D 13-21 BE	DG 18-14[2]	DH 18-114	M 59-33 GR	M 59-33 GR
D 13-21 GH	D 13-21 GH	DH 7-78	DH 7-178	M 59-33 LF	M 59-33 LF
D 13-21 GL	D 13-21 GL	DH 13-78[2]	D 13-21 GH	T 54P2[2]	D 13-21 GL
D 13-21 GM	D 13-21 GM	DH 13-79	D 13-21 GH	T 54P11[2]	D 13-21 BE
D 13-21 GP	D 13-21 GL	DN 7-14[3]	DN 7-116 F	T 54P31[2]	D 13-21 GH
D 13-26 GH	D 13-26 GH	DN 7-78	DN 7-178	T 543P2	D 13-21 GL

[1], [2], [3] and [4]
see next page

type to be replaced	ORION type	type to be replaced	ORION type	type to be replaced	ORION type
T 543P11	D 13-21 BE	5ADP1	DG 13-134	5CP2-A	DN 13-116 F
T 543P31	D 13-21 GH	5ADP1A	DG 13-134	5CP7-A	DP 13-116 F
T 5511P1	DGM 13-140	5ADP2	DN 13-134	5DQP2	D 13-21 GL
T 5511P2	DNM 13-140	5ADP2A	DN 13-134	5DQP31	D 13-21 GH
T 5511P7	DPM 13-140	5ADP7	DP 13-134	5ELP2	D 13-21 GL
T 5511P11	DBM 13-140	5ADP7A	DP 13-134	5ELP11	D 13-21 BE
3AMP1A	DG 7-132	5ADP11	DB 13-134	5ELP31	D 13-21 GH
3BKP2	DN 7-178	5ADP11A	DB 13-134	5UP1-F	DG 13-132 F
3BKP7	DP 7-178	5ADP31	DH 13-134	5UP2-F	DN 13-132 F
3BKP11	DB 7-178	5AQP1	5AQP1/T	5UP7-F	DP 13-132 F
3BKP31	DH 7-178	5AQP1A	5AQP1A/T	5UP11-F	DB 13-132 F
3BLP31[4]	DH 7-176	5AQP2	5AQP2/T	5YP1	DG 13-154
3JP1-F	DG 7-116 F	5AQP2A	5AQP2A/T	5YP2	DN 13-154
3JP2-F	DN 7-116 F	5AQP7	5AQP7/T	5YP7	DP 13-154
3JP7-F	DP 7-116 F	5AQP7A	5AQP7A/T	5YP11	DB 13-154
3JP11-F	DB 7-116 F	5AQP31	5AQP31/T	13L036V	DP 13-116 F
3KP1-F	DG 7-113 F	5AQP31A	5AQP31A/T	13L037A	DB 13-116 F
3KP2-F	DN 7-113 F	5BPH2[2]	D 13-21 GL	13L037I	DG 13-116 F
3KP11-F	DB 7-113 F	5BPH11[2]	D 13-21 BE	31B82	D 13-21 GH
3RP1A	DG 7-119	5BPH31[2]	D 13-21 GH	140 MB.	140 MB./T
3RP31A	DH 7-119	5CP1-A	DG 13-116 F		

[1] type with similar data
[2] type with identical data
[3] also for asymmetrical deflection
[4] different base

COMPARISON CHART OF OSCILLOSCOPE TUBES

Designation System

Line 1: Type number(s) (e.g. DG 7-131, DG 7-132)

Line 2: Screen form (e.g. KS), accelerator (e.g.: o), max. overall length in mm (e.g.: 172)

Line 3: max. horizontal (e.g. 41.6) and vertical (e.g. 23.2) deflection factors in V/cm

Code for Screen Forms	Code for Accelerators
K — round tube R — rectangular tube S — spherical faceplate P — flat faceplate	o — monoaccelerator n — with post-deflection accelerator s — spiral post-deflection accelerator m — mesh post-deflection accelerator

U_a (kV)	Minimal useful screen diameter and diagonal respectively (cm)			
	7	10	13	18
Bandwidth: f < 10 MHz				
0.5	DG 7-131, DG 7-132 KS o 172 41.5 23.2			
0.8	DG 7-123, DG 7-124 KS o 172 44 30			
0.8	D. 7-125, K 2007.. KP o 172 44 30			
1	D. 7-119 KP o 238 39 27,5			
1	D 7-190../T KP o 225 31 12.5			
1.5		D 10-160../T KP o 260 31.5 13.2		
2	D. 7-113 F KP o 298 53.5 41	D. M 10-111 KP o 339 41 40	D. 13-132 F KP o 384.5 30.5 24.5	
2	D. 7-115 F KP o 260.5 75 59			
2.5			5AQP../T KP o 430 20 15	

U_a (kV)	Minimal useful screen diameter and diagonal respectively (cm)			
	7	10	13	18
4	D. 7-116 F KP n 260.5 91 67		D. 13-114 KP n 375 37 30	D. 18-114 KP s 375 37.5 31.5
4			D. 13-116 F KS n 431 42 35.5	D. 18-116 KP s 375 37.5 31.5
Bandwidth: f = 10...25 MHz				
3	D. 7-176 KP m 296 10 5.85		D 13-27.. KP s 250 27 12.2	
3			K 2011.. RP s 380 18.5 11.5	
4	D. 7-126 KP s 200 62.5 46	D 10-12.. KP s 320 31 11	D. 13-134 KP n 430 26 20	
4	D. 7-178 KP s 296 40 13.7		D. M 13-136 KP s 487.5 28.5 16	
4			D. 13-154 KP n 457.5 28.5 16	
5			D. 13-136 KP s 436 33 12.4	
6		D. 10-111 KP m 335 12.5 4	D 14-180../T RP s 386 25.5...13.1	
Bandwidth: f = 25...100 MHz				
10			D 13-19.. KP s 452 33 12.4	
10			D 13-21.. KP s 468 33.5 7.2	
10			D. M 13-140 KP s 468 33.5 7.2	
15			D 13-26.. KP m 450 11 3.5	
Bandwidth: f = 100...250 MHz				
15			D 13-450../01 RP m 449 11 3.3	

COMPARISON CHART OF MONITOR TUBES

Designation System

Line 1: Type number(s) (e.g.: M 12-100 . .)

Line 2: Useful screen sizes in mm × mm (e.g.: 70 × 90), max. overall length in mm (e.g.: 180)

Line 3: nominal neck sizes in mm (e.g.: 20), Resolution in lines (e.g.: 625), $-U_{g1\ cut\ off}$ in V (e.g.: 25 . . . 50)

U_a (kV)	Deflection angle			
	55°	70° . . . 75°	90°	110°
4		140 MB./TK, K 2006. ./K 85 × 110, 173, 20 625, 15 . . . 40		
8	M 12-100. . 70 × 90, 180, 20 625, 25 . . . 50	140 MB./T, K 2006. . 85 × 110, 173, 20 625, 15 . . . 40		
9			M 23-100. . 140 × 183, 210, 20 625, 32 . . . 50	
11				M 31-120. . 195 × 257, 233, 20 625, 35 . . . 69
13		M 17-11. ., M 17-111. ./T, M 17-111. ./TK 95 × 125, 205, 20 625, 46 . . . 91	M 28-12. . 171 × 228, 250, 20 850, 46 . . . 91	
14			K 2001. . 130 × 150, 204, 20 625, 30 . . . 70	
14			K 36-20. . 211 × 270, 293, 20 625, 47 . . . 92	
16				M 38-120. . 226 × 291, 280, 29 625, 40 . . . 85
18				M 47-12. . 305 × 348, 309, 29 625, 50 . . . 93
18				M 59-33. . 385 × 489, 368, 29 625, 50 . . . 93

ORION

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