7 cm diameter flat faced monoaccelerator oscilloscope tube primarily intended for use in inexpensive oscilloscopes and monitoring devices.

QUICK REFERENCE DATA			
Accelerator voltage	$V_{g2,g4,g5,\ell}$	1000	V
Display area		60 x 50	mm^2
Deflection coefficient, horizontal	M_x	29	V/cm
vertical	M_y	11.5	V/cm

SCREEN

	colour	persistence
D7-190GH D7-190GM	green yellowish green	medium short long

Useful screen diameter   min.   64   mm

Useful scan

      horizontal   min.   60   mm

      vertical   min.   50   mm

The useful scan may be shifted vertically to a maximum of 4mm with respect to the geometric centre of the faceplate.

HEATING: Indirect by AC or DC; parallel supply

      Heater voltage V_f 6.3   V

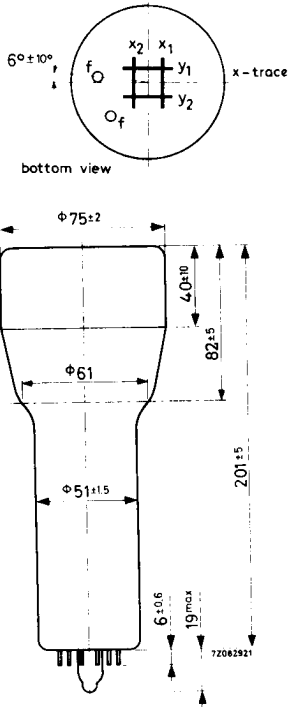   Heater current I_f 300   mA

MECHANICAL DATA

Dimensions in mm

bottom view

bottom view

Fig. 2 Pin arrangement.
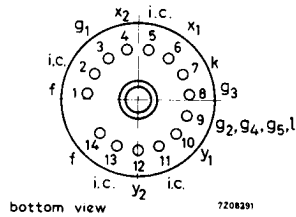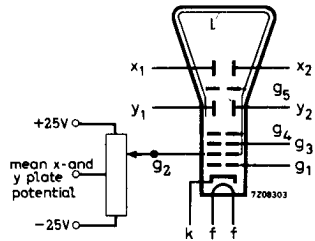

Fig. 1 Outlines.

Fig. 3 Electrode configuration.

Mounting position: any

The tube should not be supported by the base alone and under no circumstances should the socket be allowed to support the tube.

Dimensions and connections

See also outline drawing

Overall length	max.	225	mm
Face diameter	max.	77	mm
Base 14 pin all glass			
Net weight	approx.	260	g

Accessories

Socket (supplied with tube)	type	55566
Mu-metal shield	type	55534

CAPACITANCES

x_1 to all other elements except x_2	$C_{x1(x2)}$	4	pF
x_2 to all other elements except x_1	$C_{x2(x1)}$	4	pF
y_1 to all other elements except y_2	$C_{y1(y2)}$	3.5	pF
y_2 to all other elements except y_1	$C_{y2(y1)}$	3	pF
x_1 to x_2	C_{x1x2}	1.6	pF
y_1 to y_2	C_{y1y2}	1.1	pF
Control grid to all other elements	C_{g1}	5.5	pF
Cathode to all other elements	C_k	4.0	pF

FOCUSING   electrostatic

DEFLECTION   double electrostatic   **see note 3**

   x plates   symmetrical

   y plates   symmetrical

If use is made of the full deflection capabilities of the tube the deflection plates will intercept part of the electron beam, hence a low impedance deflection plate drive is desirable.

   Angle between x and y traces 90 ± 1°

LINE WIDTH see note 3

Measured with the shrinking raster method in the centre of the screen under typical operating conditions, adjusted for optimum spot size at a beam current I_{ℓ} = 10 μA.1)

Line width   l.w.   0.28   mm

As the construction of this tube does not permit a direct measurement of the beam current, this current should be determined as follows:

a) under typical operating conditions, apply a small raster display (no overscan), adjust V_{g1} for a beam current of approx. 10 μA and adjust V_{g3} and $V_{g2,g4,g5,\ell}$ for optimum spot quality at the centre of the screen.

b) under these conditions, but no raster, the deflection plate voltages should be changed to

$V_{y1} = V_{y2}$ = 1000 V; V_{x1} = 300 V; V_{x2} = 700 V, thus directing the total beam current to $x2$.

Measure the current on x_2 and adjust V_{g1} for I_{x2} = 10 μA (being the beam current I_{ℓ})

c) set again for the conditions under a), without touching the V_{g1} control. Now a raster display with a true 10 μA screen current is achieved.

d) focus optimally in the centre of the screen (do not adjust the astigmatism control) and measure the line width.

TYPICAL OPERATING CONDITIONS 3)

Accelerator voltage	$V_{g2,g4,g5,\ell}$		1000 V
Astigmatism control voltage	$\Delta V_{g2,g4,g5,\ell}$		± 25 V 1)
Focusing electrode voltage	V_{g3}		100 to 180 V
Control grid voltage for visual extinction of focused spot	V_{g1}	max.	−35 V
Grid drive for 10 μA screen current		approx.	10 V
Deflection coefficient, horizontal	M_x	max.	29 V/cm 31 V/cm
vertical	M_y	max.	11,5 V/cm 12,5 V/cm
Deviation of linearity of deflection		max.	1 % 2)
Geometry distortion		see note 4	
Useful scan, horizontal		min.	60 mm
vertical		min.	50 mm

LIMITING VALUES (Absolute max. rating system)

Accelerator	$V_{g2,g4,g5,\ell}$	max. min.	2200 V 900 V
Focusing electrode voltage	V_{g3}	max.	2200 V
Control grid voltage, negative	$-V_{g1}$	max. min.	200 V 0 V
Cathode to heater voltage	V_{kf} $-V_{kf}$	max. max.	125 V 125 V
Grid drive, average		max.	20 V
Screen dissipation	W_ℓ	max.	3 mW/cm²
Control grid circuit resistance	R_{g1}	max.	1 MΩ

1. All that will be necessary when putting the tube into operation is to adjust the astigmatism control voltage once for optimum spot shape in the screen centre. The control voltage will always be in the range stated, provided the mean x plate and certainly the mean y plate potential was made equal to $V_{g2,g4,g5,\ell}$ with zero astigmatism correction.
2. The sensitivity at a deflection of less than 75% of the useful scan will not differ from the sensitivity at a deflection of 25% of the useful scan by more than the indicated value.
3. The mean x and certainly the mean y plate potential should be equal to $V_{g2,g4,g5,\ell}$ with astigmatism adjustment set to zero.
4. A graticule, consisting of concentric rectangles of 40 mm x 50 mm and 39,2 mm x 49 mm is aligned with the electrical x-axis of the tube. The edges of a raster will fall between these rectangles.

INSTRUMENT CATHODE-RAY TUBE

7 cm diameter flat-faced monoaccelerator oscilloscope tube with low heater consumption.

QUICK REFERENCE DATA

Accelerator voltage	$V_{g2, g4, g5}$ (ℓ)	1000 V
Display area		60 x 50 mm²
Deflection coefficient		
horizontal	M_x	29 V/cm
vertical	M_y	11,5 V/cm

The D7—191 is equivalent to the type D7—190.. except for the following.

HEATING

Indirect by AC or DC; parallel supply

Heater voltage	V_f		6,3 V
Heater current	I_f		95 mA

LIMITING VALUES (Absolute maximum rating system)

Cathode to heater voltage				
positive	$V_{k/f}$	max.	100 V
negative	$-V_{k/f}$	max.	15 V

CAPACITANCES

Cathode to all other elements	C_k		2,3 pF