

WASSENAAR

PHILIPS

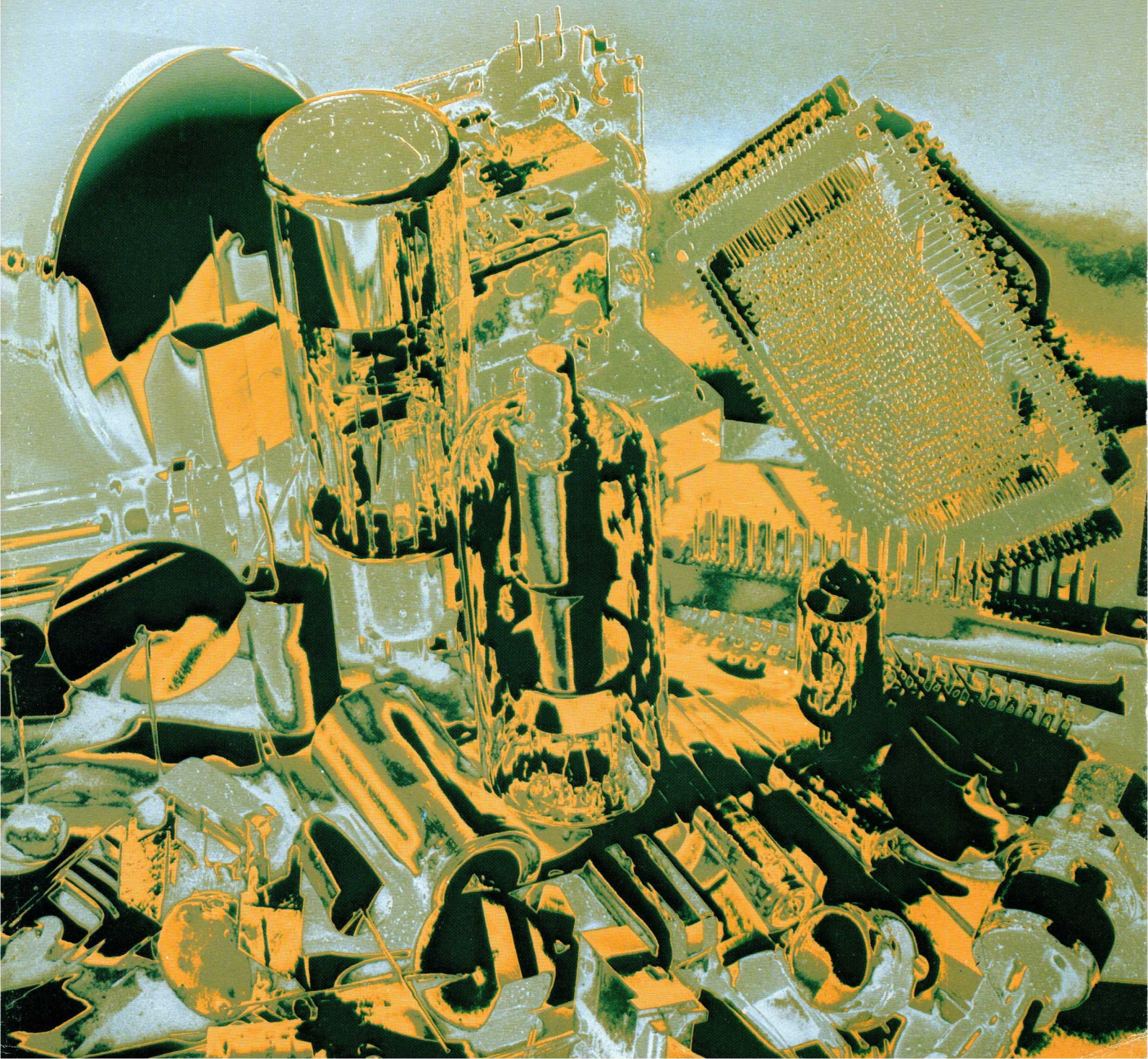
Catalogue



Electronic
components
and materials

Cathode ray tubes Camera tubes

June 1974



This catalogue is one of a planned series that will comprise the titles listed below.

Industrial subassemblies	Circuits: analogue –40-series and CSA70; digital FZ-30 series (HNIL) and 60- and 61-series NORbits, 90-series and 50-series counter modules, variable mains transformers.
Thumbwheel switches.	normal, miniature.
Resistors (CM2a).	– fixed, variable, non-linear.
Capacitors (CM2b).	– ceramic, paper, film, electrolytic, variable; test switches.
Radio, audio, television.	F.M. tuners, coax. aerial input assemblies. Black/white and colour television; picture tubes, deflection components, tuners, delay lines. Loudspeakers, cross-over filters. Receiving tubes (index).
Soft ferrites.	Ferrites for radio, audio and television. Coil components, microchokes and wide-band h.f. chokes. Ferroxcube potcores, square cores and transformer cores.
Piezoelectric ceramics. Permanent magnet materials.	
Memory products.	Ferrite cores; matrix planes, platrics, matrix stacks. Complete memories.
Electric motors and accessories. Timing and control devices.	Small synchronous, asynchronous, d.c. and stepper motors. BITE indicators. Timers, delays, counters, time code generators, aircraft clock systems, etc.
Transmitting tubes for communication. Tubes for r.f. heating. Amplifier circuit assemblies (ET1).	
Microwave products.	Pulsed and continuous wave magnetrons. Klystrons, travelling wave tubes, t-r switches. Isolators, circulators, diodes, triodes.
Cathode-ray and Camera tubes	Instrument, monitor and data display tubes. Projection tubes and flying spot scanners. Plumbicon, vidicon t.v. camera tubes for broadcasting, medical and scientific purposes. Deflection assemblies for camera tubes.
Products for nuclear technology. Photo-diodes.	Photomultiplier tubes, channel electron multipliers. Scintillators. Photoscintillators. Radiation counter tubes. Neutron generator tubes.
Gas-filled tubes.	Voltage stabilizing and reference tubes. Counter, selector and indicator tubes. Trigger tubes. Switching diodes. Thyratrons. Ignitrons. Industrial and high voltage rectifying tubes.
Semiconductors.	Diodes, thyristors, transistors, FET's microminiature devices, devices for opto electronics.
Linear integrated circuit.	for: all signal processing functions in colour and b/w t.v., for f.m. and a.m. audio GP and wide-band amplifiers, channel amplifiers, difference and amps, hearing aids, etc.
Digital integrated circuits.	DTL (FC family), CML (GX families), MOS (FD-FE families).
Connectors	
Semiconductor radiation detectors	
Photomultipliers	

This catalogue is one of a series covering a full range of electronic components and materials. It is a companion to our data handbook system and presents the brief information needed for preliminary selection of a product. It should also provide ready access to the data handbook, where full design data and recommended accessories can be found.

We hope that the information is so arranged that selection is made easy: in putting it together we have tried to see things from our customers' point of view. We include a status guide to help you choose the right type.

If either the scope of the information or its arrangement falls short of your needs, please let us know. We try to serve our customers as much in our information service as we do in providing the right product at the right price, and in backing it with a full application service.

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Status guide

D = DEVELOPMENT TYPE

Development samples available. Inclusion in catalogue does not necessarily imply that the device will go into production.

P = PREFERRED TYPE

Recommended for new equipment design.

C = CURRENT TYPE

Available for equipment production and maintenance. No longer recommended for new equipment design.

M = MAINTENANCE TYPE

Available for equipment maintenance. No longer recommended for equipment production.

Full information in
Data Handbook for:

Cathode ray tubes ET5a 11 - 73
Camera tubes and
Deflection assemblies ET5b 12 - 73

CATHODE RAY TUBES

740308 - 10 - 08



D14-250GH

Note particularly the flat-faced range:

- includes a rectangular tube *
- rugged construction
- compactness
- high current efficiency
- high control sensitivity

* The D14-250GH has the same mechanical dimensions as the D14-260GH allowing the production of two oscilloscope styles (0-10 MHz and 0-15-20 MHz) on the same basic chassis and cabinet.

INSTRUMENT TUBES

Types listed have GH (H) or G phosphor (standard green)
Other phosphors on request.

Heater : 6,3 V/300 mA
Deflection : symmetrical x and y } unless otherwise stated

Mono-accelerator

type	status	useful screen min. mm	useful scan min.		typical operating conditions			overall length max. mm
			hor. mm	vert. mm	deflection coefficient		accelerator voltage V	
			hor.	vert.	hor.	vert.		
			mm	mm	V/cm	V/cm		
DH3-91	C	∅28	full	full	56,5	49	500	105
DG7-5	M	∅65	full	full	62,5	40	800	160
DG7-6	M	as DG7-5, however asymmetrical hor. defl.						
DG7-32	P	∅65	full	full	37	21	500	172
DG7-31	P	as DG7-32, however asymmetrical hor. defl.						

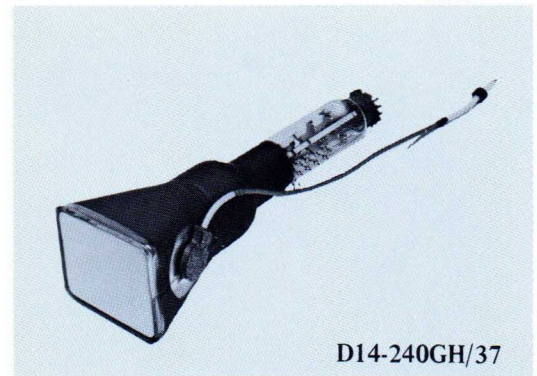
flat faced

D7-190GH	P	∅64	60	50	29	11,5	1000	225
D7-191GH	P	as D7-190GH, however heater 6,3 V/95 mA						
D10-160GH	P	∅85	80	60	32	13,7	1500	260
D10-161GH	P	as D10-160GH, however heater 6,3 V/95 mA						
D13-480GH	P	∅114	100	80	31,3	14,4	2000	310
D13-481GH	P	as D13-480GH however heater 6,3 V/95 mA						
D14-250GH	D	□100x80	100	80	24	13	2000	331
D14-251GH	D	as D14-250GH however heater 6,3 V/95 mA						

CATHODE RAY TUBES

740308 - 10 - 09

All preferred types are now in a rectangular bulb and with mesh post deflection accelerator. Special attention is drawn to the D14-240GH/37 which is a very compact (short) tube for broad bandwidths. The D14-260GH is a new 15-20 MHz rectangular tube specifically designed for economy and offering distinct performance advantages over spiral p.d.a. tubes in a rectangular bulb - particularly with respect to overall length and uniformity of line width over the full screen area.



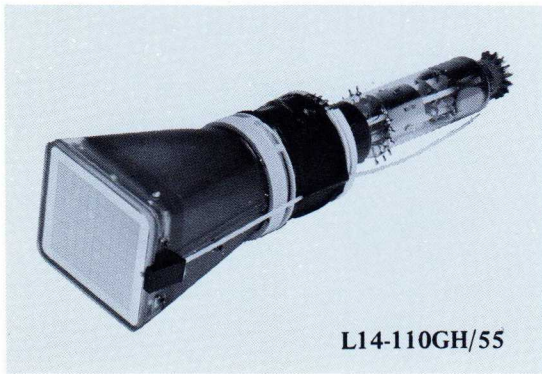
D14-240GH/37

Post-deflection accelerator – all types are flat faced

type	status	useful screen min. mm	useful scan min.		typical operating conditions				overall length max. mm	p.d.a.	
			hor. mm	vert. mm	deflection coefficient hor. V/cm	deflection coefficient vert. V/cm	accelerator voltage				
							first kV	final kV			
DH7-11	C	∅ 68	60	45	10,7	3,65	1,2/0,3	1,2	296	helical	heater 6,3 V/95 mA
D13-27GH	C	∅ 114	full	80	24	11,5	1,5	3	354	helical	
D14-120GH	P	□ 100x80	100	80	15,5	4,2	1,5	10	385	mesh	
D14-121GH	P	as D14-120GH but with side connections x and y plates									
D14-122GH	P	as D14-120GH but with rotation coil									
D14-123GH	P	as D14-121GH but with rotation coil									
D14-160GH/09	P	□ 100x80	100	80	15,2	4,1	1,5	10	417,5	mesh	with internal graticule and correction coils
D14-260GH	D	□ 100x80	100	80	19	9	2	4	331	mesh	
double gun											
E10-12GH	C	∅ 85	full	70	15	7	1	3	410	helical	
E10-130GH	C	∅ 85	full	70	17	7,4	1	4	410	helical	
split beam											
E14-100GH	P	□ 100 x 80	100	80	13,5	9	1,5	10	425	mesh	
high frequency tubes; with internal graticule and correction coils											
D13-451GH/45	M	□ 100 x 60	100	60	9,9	3	1,5	15	449	mesh	
D14-240GH/37	D	□ 100x80	100	80	9	3	2	20	385	mesh	wide band oscilloscopes 100-250 MHz
D13-500GH/01	C	□ 100 x 60	100	60	13,5	1,7	2,5	15	492	mesh	with delay line system; wide band oscilloscopes over 300 MHz

CATHODE RAY TUBES

740308 - 10 - 10



L14-110GH/55

The success of the L14-110GH/55 has led us to extend the concept with a split-beam storage tube, ideal for simultaneous presentation of dual traces derived from a single shot event. This new addition allows a storage version of split-beam oscilloscopes without fundamental changes in circuitry.

Storage tubes

variable persistence
internal graticule
correction coils

type	status	useful screen min. mm	useful scan		typical operating conditions deflection coefficient		accelerator voltage		writing speed min. div/ms*	storage time min. min.**	overall length max. mm
			hor. mm	vert. mm	hor. V/div	vert. V/div	first V	final kV			
L14-110GH/55	P	□90x72	90	72	9,5	4,1	1500	8,5	100	1,5	445
L14-130GH/55	D	□90x72	90	72	9,5	9	1500	8,5	100	1,5	445

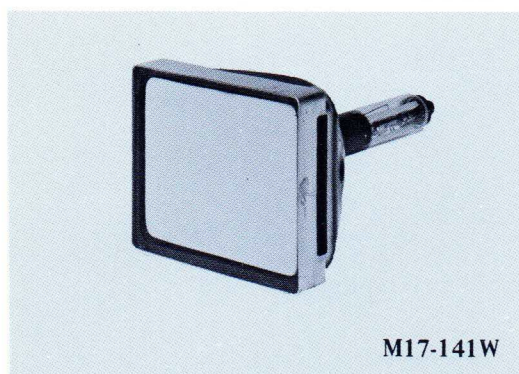
Note: 1 div/9 mm

* defined as the maximum speed at which a trace is just visible against a "just black" background. If some background is tolerated the writing speed can be raised to approx. 1 cm/μs.

** defined as the time taken for the background to rise from zero luminance to 10 % of saturated luminance. At reduced intensity the storage time can be longer.

SCREEN PHOSPHORS AND EQUIVALENTS

Designation		Colour		Persistence	Typical use
Pro-Electron new	Jedec old	Fluorescence	Phosphorescence		
BE	B	P11	blue	medium short	oscillography and photography
GH	H	P31	green	medium short	
GJ	G	P1	yellowish-green	medium	
GM	P	P7	purplish-blue	long	low-speed oscillography
GP	—	P2	bluish-green	medium short	medium-speed oscillography, photography
GR	—	P39	green	long	monitoring and display devices
GU	—	—	white	very short	
BA	C	—	purplish-blue	very short	
W	W	P4	white	medium short	television and monitoring devices
WA	—	—	white	medium short	



M17-141W

MONITOR AND DATA DISPLAY TUBES

Types listed have W phosphor; M38-120 and M38-121 also available with WA phosphor; see previous page
Other phosphors on request (e.g. GH, GR, GM)

Heater : 6,3 V/300 mA
Deflection : magnetic, unit No. AT1071/01 (for M17 and M24 tubes only)
Focusing : electrostatic

type	status	useful screen min.		deflection angle °	neck diameter mm	accelerator voltage		overall length max. mm	
		hor. mm	vert. mm			first V	final kV		
M17-140W	P	124	93	70	28	400	14	234	
M17-141W	P	124	93	70	28	600	16	240	with bonded faceplate and mounting band.
M24-100W	P	190	140	90	28	600	16	260	
M24-101W	P	as M24-100W but with:							integral protection and mounting lugs.
M38-120W	P	290	226	110	28	400	16	279,5	
M38-121W	P	as M38-120W but with:							integral protection and mounting lugs.

PROJECTION TUBES

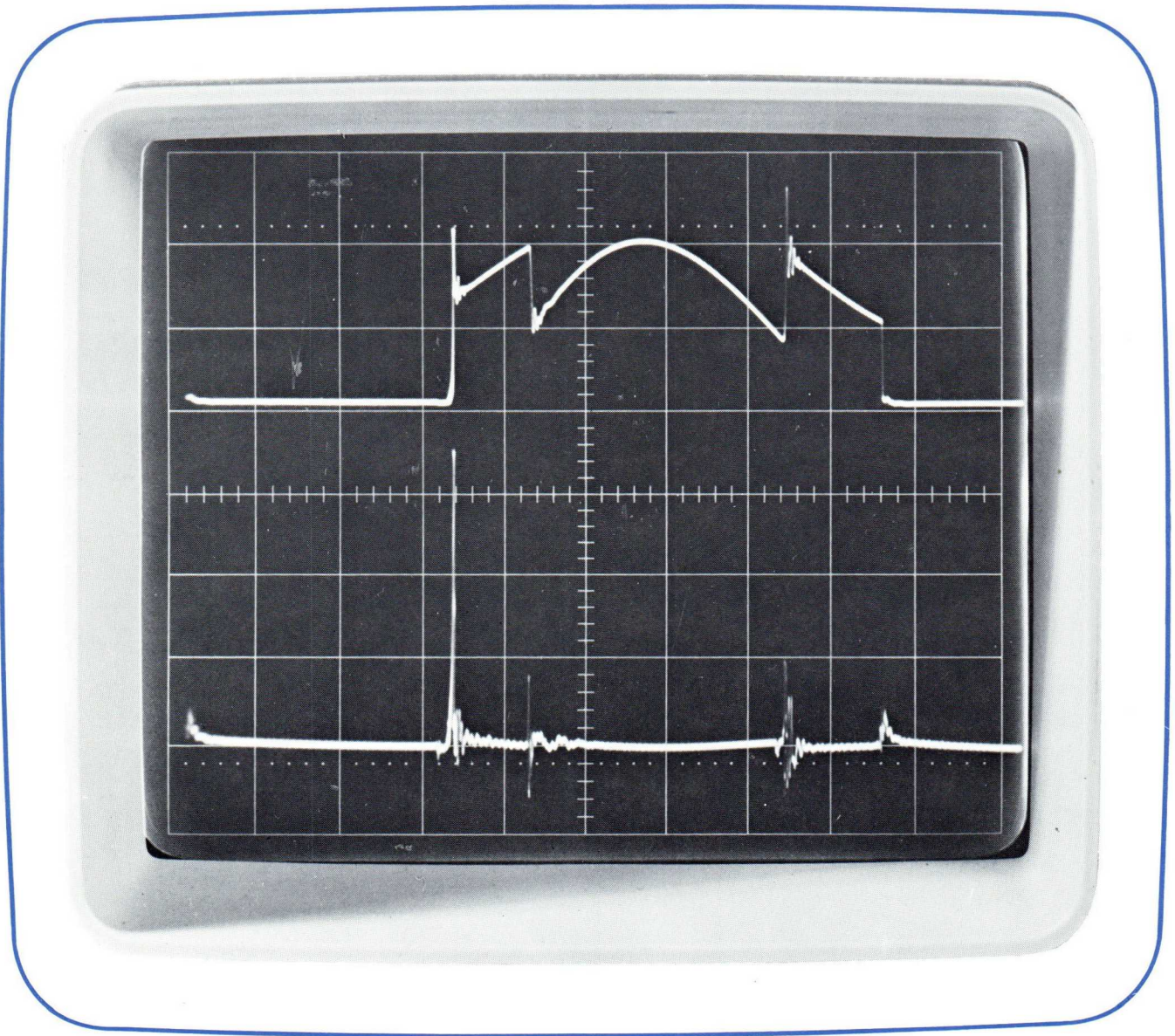
Heater 6,3 V/300 mA; magnetic deflection and focusing

type	status	colour	useful screen area, min mm	deflection angle °	neck diameter mm	accelerator voltage kV	overall length max. mm	
MG13-38	C	green	92x69	47	38	50	374	
MU13-38	C	blue						
MY13-38	C	red						

FLYING SPOT SCANNER TUBES

Heater 6,3 V/300 mA; magnetic deflection

type	status	useful screen mm	deflection angle °	neck diameter mm	accelerator voltage kV	overall length mm		
								Q7-100GU
Q13-110BA	C	b/w colour	∅108	40	38	25	347	magnetic focusing;
Q13-110GU								



Having set the world standard in t.v. camera tubes, development hasn't stood still. The standard has been continually reset and they range of Plumbicon® camera tubes has been broadened to meet every broadcasting and professional/ industrial purpose.

A wide range of sizes in various gun configurations is now available.



PLUMBICON® TUBES

Tube diameter	5/8 (15,9)	1 (25,4) standard		1 (25,4) *		1¼ (30) standard		1¼ (30) **		1¼ (30) ***		inch (mm)
Photoconductor type	ER	SHR	ER	SHR	ER	ST	ER	SHR	ER	SHR		
Sensitivity at 2856K	type 360	400	350	400	350	400	450	400	450	300		µA/lm
Resolution	≥ 600	750		750		600	750	750		—		t.v. lines
	≥ —	—		—		—	—	—		25		lp/mm
Modulation depth at:												
320 t.v. lines	typ. 35	—		—		—	—	—		—		%
400 t.v. lines	typ. —	40		40		40	55	55		—		%
Heater current at 6,3 V	300	95		95		95 and 300		300		300		mA
Focusing	electrostatic							magnetic				
Deflection								magnetic				
Mesh construction	all separate, unless otherwise stated											
Socket	9390 225 10000	TE1004		56026		56021		56021		56025		
Mask for anti-halation disc	—	56028		56028		56029		56029		—		
Biaslight lamp assembly	—	—		56027		—		56027		56027		
Deflection assemblies:												
rear loading: B/W	AT1117	—		AT1119		—		AT1132/01		—		
colour	AT1117	—		AT1115		—		AT1113/01		—		
front loading:												
B/W and colour	—	AT1102/01; AT1103, AT1116						—		—		

for data see under
'Deflection assemblies'

* WITH ANTI-COMET-TAIL GUN AND PROVISIONS FOR EXTERNAL BIASLIGHT

** WITH PROVISIONS FOR EXTERNAL BIASLIGHT

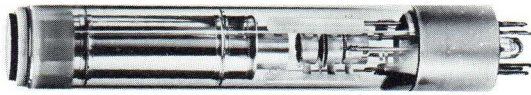
*** WITH ANTI-COMET-TAIL GUN, PROVISIONS FOR EXTERNAL BIASLIGHT AND FIBRE OPTIC FACEPLATE

Abbreviations

SHR special high resolution
ER extended red
ST standard

CAMERA TUBES

730426 - 13 - 20



1-inch Plumbicon camera tube
XQ1085

The XQ1080 series which features an anti-comet-tail gun and provisions for external biaslight is now complete. The series now includes types for the red channel, and can be considered as the standard broadcast and industrial range of the foreseeable future.

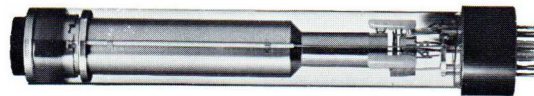
Plumbicon[®] tubes continued

type	status	application	photoconductive layer	spectral response; cut-off nm	quality grade	loading	overall length max. mm
5/8 inch (15,9 mm)							
XQ1213	M	B/W, R, G, B	ER	850	broadcast	rear	136
XQ1214	▲				industrial		
1 inch (25,4 mm), standard							
XQ1070	P	B/W, L, R, G, B	SHR	650	broadcast		
XQ1070/01	■						
XQ1071	P	B/W, R, G, B	SHR	650	industrial		
XQ1071/01	■						
XQ1072	P	—	SHR	650	medical		to be lens coupled to X-ray image intensifier
XQ1073	P	B/W, R	ER	900	broadcast	front	172
XQ1073/01	■						
XQ1074	P	B/W, R	ER	900	industrial		
XQ1074/01	■						
XQ1075	P	B/W, R	ER	750	broadcast		with infrared filter on disc
XQ1076	P				industrial		
1 inch (25,4 mm); with anti-comet-tail gun and provisions for external biaslight							
XQ1080	P	B/W, L, R, G, B	SHR	650	broadcast		
XQ1081	P	B/W, R, G, B	SHR	650	industrial		
XQ1083	P	B/W, R	ER	900	broadcast	rear	
XQ1084	P	B/W, R	ER	900	industrial		
XQ1085	P	B/W, R	ER	750	broadcast		
XQ1086	P	B/W, R	ER	750	industrial		
XQ1090	▲	B/W, L, R, G, B	SHR	650	broadcast		
XQ1091	▲	B/W, R, G, B	SHR	650	industrial		
XQ1093	▲	B/W, R	ER	900	broadcast		
XQ1094	▲	B/W, R	ER	900	industrial		
XQ1095	▲	B/W, R	ER	750	broadcast		
XQ1096	▲	B/W, R	ER	750	industrial		
XQ1100	■	B/W, L, R, G, B	SHR	650	broadcast		
XQ1101	■	B/W, R, G, B	SHR	650	industrial		
XQ1102	■	—	SHR	650	medical		
XQ1103	■	B/W, R	ER	900	broadcast	front	170
XQ1104	■	B/W, R	ER	900	industrial		with infrared filter on disc
XQ1105	■						
XQ1106	■						
XQ1107	■						
XQ1108	■						
XQ1109	■						
XQ1110	■						
XQ1111	■						
XQ1112	■						
XQ1113	■						
XQ1114	■						
XQ1115	■						
XQ1116	■						
XQ1117	■						
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XQ1120	■						
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XQ1123	■						
XQ1124	■						
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XQ1282	■						
XQ1283							

CAMERA TUBES

The XQ1410 range is the range that really resets the Plumbicon® tube standard. The series is based on a 1¼ inch tube with anti-comet-tail gun and provision for bias lighting. Typical modulation depths of 55% at 5 MHz (400 t.v. lines) can be expected. The internal bias lighting (via a light pipe) further reduces lag and boosts the dynamic resolution – features that add up to improved camera sensitivity.

730426 - 13 - 16



1¼ inch Plumbicon camera tube
XQ1410

type	status	application	photoconductive layer	spectral response; cut-off nm	quality grade	loading	overall length max. mm
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1¼ inch (30 mm); standard

55875	●	M	B/W, L, R, G, B	ST	650	broadcast			integral mesh		
55875-1G	●	M	B/W, R, G, B	ST	650	industrial					to be lens coupled to X-ray image intensifier
55876	■ ●	M	—	ST	650	medical					
XQ1020		P	B/W, L, R, G, B	ST	650	broadcast			to be lens coupled to X-ray image intensifier		
XQ1021		P	B/W, R, G, B	ST	650	industrial				rear	220
XQ1022	■	P	—	ST	650	medical					
XQ1023		P	B/W, L, R	ER	850	broadcast			with infrared filter on disc		
XQ1024		P	B/W, R	ER	850	industrial					
XQ1025		P	B/W, L, R	ER	750	broadcast					
XQ1026		P	B/W, R	ER	750	industrial					

1¼ inch (30 mm); with provisions for external biaslight

XQ1410		P	B/W, L, R, G, B	SHR	650	broadcast			
XQ1411		P	B/W, R, G, B	SHR	650	industrial			
XQ1413		P	B/W, L, R	ER	850	broadcast			
XQ1414		P	B/W, R	ER	850	industrial			
XQ1415		P	B/W, L, R	ER	750	broadcast			with infrared filter on disc
XQ1416		P	B/W, R	ER	750	industrial			

1¼ inch (30 mm); with anti-comet-tail gun, provisions for external biaslight and fibre optic faceplate

XQ1230 series	■	M	—	SHR	650	medical LL t.v. scientific	rear	210	to be lens coupled to X-ray image intensifier with fibre optic output window
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Abbreviations

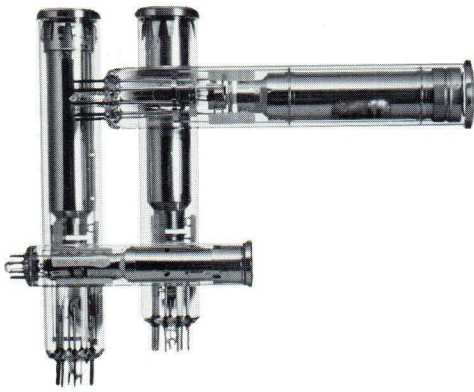
SHR special high resolution
ER extended red
ST standard

B/W black and white
L luminance
R red
G green
B blue

- without anti-halation glass disc
- heater current 95 mA instead of 300 mA

CAMERA TUBES

730403 - 03 - 01



- complete application range
- choice of photoconductive layers
- variety of sizes
- variety of gun configurations
- silicon multi-diode array targets

VIDICON TUBES

Tube diameter type	status	spectral response; peak nm	resolution (lp/mm) t.v. lines	modulation depth at 400 t.v. lines typ.; %	heater current at 6,3 V mA	overall length max. mm	deflection assembly	socket
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2/3 inch (16,9 mm)

Focusing: : magnetic but for XQ1272 electrostatic
 Deflection : magnetic
 Mesh construction: separate but for XQ1270 integral

XQ1270	P	550	≥400	20	100	108	KV12	9390 225 10000
XQ1271	P						KV19B	
XQ1272	P						KV19B	

1 inch (25,4 mm)

Focusing : magnetic but for XQ1010 electrostatic
 Deflection : magnetic but for XQ1010 electrostatic
 Mesh construction: separate but for XQ1031 and XQ1032 integral

XQ1010	▲	550	≥600	40	300	159	—	2422 505 00001
XQ1031	P				95	130	AT1102/01 *	TE1004
XQ1032	P						or	
XQ1240	P		≥1000	50		159	AT1103 *	
XQ1241	P						or	
XQ1280	P	475	≥(60)	—			AT1116 *	
XQ1285	P		≥(50)	—				with fibre optic face plate
XQ1400 series	P		≥600	40				silicon multi-diode target

* see under 'Deflection assemblies'

▲ available on request

CAMERA TUBES

type	APPLICATIONS *					
	general purpose	military surveillance	scientific	industrial CCTV	medical **	broadcast black/white colour

2/3 inch (16,9 mm)

XQ1270	■		■	■		
XQ1271	■		■	■		
XQ1272	■		■	■		

1 inch (25,4 mm)

XQ1010		■	■	■	■	
XQ1031	■		■	■		■
XQ1032	■					
XQ1240			■	■		■
XQ1241	■		■			
XQ1280 **			■		■	
XQ1285 ***		■	■		■	
XQ1400 series	■		■	■		

* That a tube is recommended for particular applications does not exclude its use in others.

** To be lens coupled to X-ray image intensifier tube

*** To be lens coupled to X-ray image intensifier tube with a fibre optic output window.

DEFLECTION ASSEMBLIES

for camera and monitor tubes

A 55071 - 3
A 55071 - 4



AT1102/01

AT1116

Our specially designed deflection assemblies obtain the highest performance from our tubes. For high quality colour cameras * the use of "triplet" deflection units, three coils selected on differential geometrical errors, is recommended.

* For non-broadcast applications (e.g. industrial, educational, cable T.V.) any of these coils can be used.

- single and triple coil assemblies
- front and rear loader units
- all standard camera tube sizes
- deflection assemblies for monitors

type	deflection coils						focus coil		assembly	alignment horizontal and vertical Ω
	line			frame			Ω	mA		
operating conditions:	mH	Ω	mAp-p	mH	Ω	mAp-p	Ω	mA		
AT1071/01	0,093	0,15	8,6A	56	27	425	-	-	monitor	perm. magnetics
AT1102/01	0,95	2,6	250	27	84	34	3770	23	single	perm. magnetics
AT1103	0,95	2,6	250	27	77	38	2500	26	single	670
AT1113/01	0,97	2,4	210	22	68	32	150	110	single	2025
AT1113/03	0,97	2,4	210	22	68	32	150	110	triplet	2025
AT1115/01	0,78	2,4	245	26	64	34	1720	30	triplet	560
AT1116	0,78	2,4	330	28	62	48	149	105	single	560
AT1117	0,78	10	140	13,2	155	25	-	-	single	520
AT1119/01	0,78	2,4	245	26	64	34	1720	30	single	560
AT1132/01	0,97	2,4	210	22	84	32	2750	25	single	2025





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