ENGLISH ELECTRIC VALVE COMPANY LIMITED

THE M-O VALVE COMPANY LIMITED

GEC

PROFESSIONAL ELECTRON TUBES Abridged Data 1976/77

FOREWORD

This catalogue contains abridged data for all the current products of EEV and M-OV, who together offer the most comprehensive range of electron tubes in Europe.

Colour Code
Throughout the catalogue the following colour code is used:—
Brown indicates manufacture by English Electric Valve Co Ltd
Blue indicates manufacture by The M-O Valve Co Ltd

Data
The catalogue is divided into product sections and thumb-indexed for easy access. Full data for any tube are available upon request.

Equivalents Index
A comprehensive equivalents index showing all the tubes for which EEV/M-OV can offer a replacement begins on page 91.

Ordering
So that you obtain prompt service please direct orders for EEV products to Chelmsford and for M-OV products to Hammersmith at the addresses given below. Please do not mix products of both companies on one order.

Issued by The G.E.C. Electronic Tube Company Limited, a Management Company which unites the activities of The M-O Valve Company Limited and English Electric Valve Company Limited.

English Electric Valve Company Limited
Waterhouse Lane, Chelmsford, Essex, CM1 2QU
Telephone: Chelmsford (0245) 61777 Telex: 99103

The M-O Valve Company Limited
Brook Green Works, Hammersmith, London, W6 7PE
Telephone: 01–603–3431 Telex: 23435

ABRIDGED DATA

Represented in the Netherlands by
SAIT Electronics Nederland
Verzamelgebouw-Zuid, Strevelsweg 700/507
Rotterdam–3021
Telephone: 010–814644, 010–814841
Telex: 24315

The following pages give abridged data for the current range of EEV/M-OV tubes, devices and accessories.

Comprehensive data sheets giving operating conditions, characteristic curves, and outline drawings are available on request.

Certain types listed in this catalogue may not be available from current production and their supply may be subject to a minimum order quantity. Enquiries for special tubes not included in the catalogue are also welcome.

Colour Code

Throughout the data the following colour code is used:–
Brown indicates manufacture by English Electric Valve Co Ltd
Blue indicates manufacture by The M-O Valve Co Ltd

CARACTERISTIQUES ABREGEES

Dans les pages suivantes sont données les caractéristiques abrégées pour la gamme courante de tubes, dispositifs et accessoires EEV/M-OV.
Des fiches de caractéristiques établissant les conditions de fonctionnement, les courbes et les schémas d'ensemble sont disponsibles sur demande.
Certains types mentionnés dans ce catalogue peuvent ne pas être disponsibles parmi les produits de production courante et leur livraison peut être sujette à la commande d'une quantité minimum.
Nous répondons également aux demandes de renseignements pour les tubes spéciaux non mentionnés dans ce catalogue.

Code des Couleurs
Pour toutes les indications nous utilisons le code de couleur suivant:

Marron: produits fabriqués par English Electric Valve Co Ltd

Bleu: produits fabriqués par M-O Valve Co Ltd

RESUMEN INFORMATIVO DE DATOS

En las páginas siguientes aparece un resumen informativo de datos correspondientes a la neuva gama de lámparas, dispositivos y accesorios EEV/M-OV.
Tendremos sumo gusto en facilitar, a solicitud de las partes interesadas, hojas con los datos completos, incluyendo condiciones de funcionamiento, curvas de característica y planos acotados.
Es posible que ciertos tipos detallados en este Catálogo no puedan obtenerse dentro de la línea normal de producción actual y su suministro puede estar sujeto a un pedido minimo. Sírvanse solicitar información relativa a lámparas especiales, no incluidas en este Catálogo.

Clave de Colores
En todo lugar se ha utilizado la siguiente clave de colores:

Marrón indica fabricado por la English Electric Valve Co Ltd

Azul indica fabricado por la M-O Valve Co Ltd

KURZGEFASSTE DATEN

Auf den folgenden Seiten finden Sie kurzgefaßte Daten für das gegenwartige Herstellungsprogramm von EEV/M-OV-Röhren, Geräten und Zubehör.
Ausführliche Datenblätter mit Betriebsbedingungen, Leistungskurven und Maßzeichnungen sind auf Anfrage erhältlich.
Es ist möglich, daß sich einige der in diesem Katalog angeführten Positionen nicht im gegenwärtigen Produktionsprogramm befinden und daß daher deren Lieferung von einer Bestellung von Mindeststückzahlen abhängig gemacht werden muß. Anfragen wegen Spezialröhren, die nicht in diesem Katalog enthalten sind, bearbeiten wir gerne.

Farbkennzeichnung
Die folgende Farbkennzeichnung wird für die daten verwendet:

Braun: Produkt der English Electric Valve Co Ltd

Blau: Produkt der M-O Valve Co Ltd

DATI ABBREVIATI

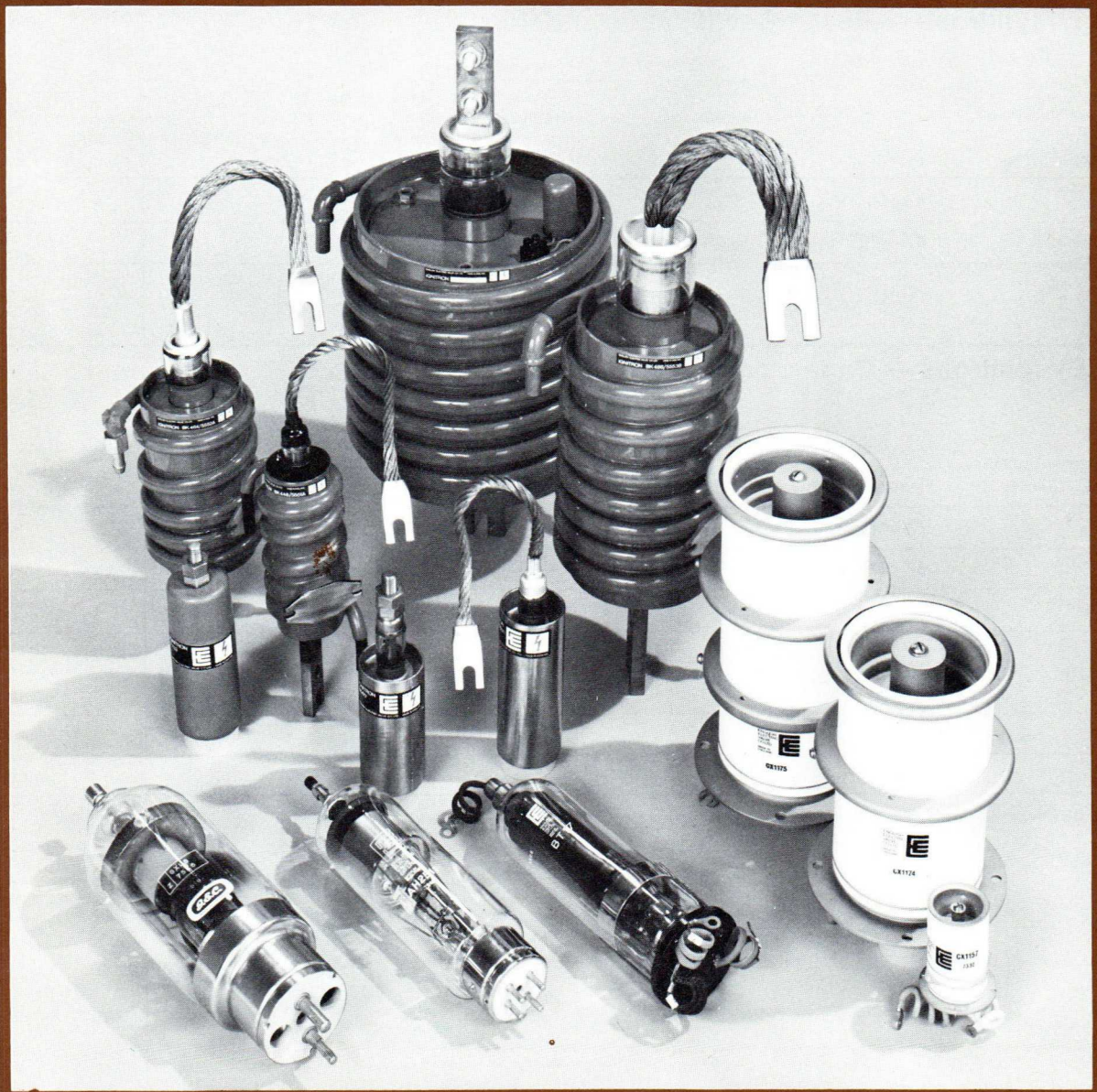
Alle pagine seguenti figurano dati abbreviati inerenti la presente serie di valvole, dispositivi ed accessori EEV/M-OV.
Le pubblicazioni tecniche più approfondite, contenenti le condizioni di funzionamento, curve delle caratteristiche e disegni del contorno, vengono fornite su richiesta.
Alcuni modelli elencati nel presento catalogo non sono disponibili nella normale produzione e la relativa fornitura può essere subordinata all'ordinazione di un quantitativo minimo.
Nel caso di valvole speciali non incluse nel presente testo, il cliente è pregato di interpellarci.

Colore Codice
Nel presente opuscolo, si usa il seguente codice:—

il marrone indica che la valvola è costruita dalla English Electric Valve Co Ltd

il blu indica che la valvola è costruita dalla M-O Valve Co Ltd

POWER DEVICES



EEV Ignitrons — A.C. Resistance Welding

International letter size	Type	Single phase service□ Maximum demand (kVA)	Corresponding average anode current (A)	Maximum average anode current (A)	3-phase (frequency changing) service Maximum peak current (at 1500V peak) (A)	Corresponding average anode current (A)	Maximum average current (at 1500V peak) (A)
A	**BK66/5550**	300	12.1	22.4	–	–	–
B	**BK448/5551A**	600	30.2	56	480	4.0	18
B	**BK492/7669**	As BK448/5551A but with coaxial cathode terminal flange					
Uprated B	**BK502**	1000	43	75	–	–	–
C	**BK484/5552A**	1200	75.6	140	–	–	–
C	**BK494/7671**	As BK484/5552A but with coaxial cathode terminal flange					
C	**BK5822A**	–	–	–	1200	16	56
Uprated C	**BK544**	2300	110	180	–	–	–
D	**BK486/5553B**	2400	192	355	2400	32	112
D	**BK498/7673**	As BK486/5553B but with coaxial cathode terminal flange					
Uprated D	**BK482**	3225	210	400	–	–	–
Uprated D	**BK500**	As BK482 but with coaxial cathode terminal flange					

Note Ignitor requirements (anode firing), 12A, 200V, for all a.c. resistance welding types.

EEV Ignitrons — Power Rectification and Control

International letter size	Type	Maximum ratings (at 900V peak) Peak anode current (A)	Average continuous current (A)	Average current 1 minute (A)	Ignitor requirements Voltage required to fire (min) (V)	Current required to fire (min) (A)
C	**BK504/5554**	900	100	200	450	45
D	**BK46/5555**	1800	200	400	450	45

EEV Ignitrons — Capacitor Discharge, Pulse Duty

International letter size	Type	Maximum ratings Peak forward anode voltage (kV)	Peak anode current (kA)	Average anode current (A)	Ampere-seconds per pulse (A.s)
A	**7703**◇	20	100	0.75	10
A	**BK472**♦	20	100	0.75	10
A	**BK474**♦	20	100	0.75	10
A	**BK476**†	20	100	0.75	10
C	**BK506**	25	100	10	50
D	**BK488**	25	100	40	200
E	**BK496**	25	100	80	400

Note Plastic coated versions of all the above ignitrons except size A types are available.

◇ For use with high voltage and high current reversal.

♦ For reduced degree of current reversal and switching applications.

† For zero current reversal.

♦ For current reversal at reduced voltage and current.

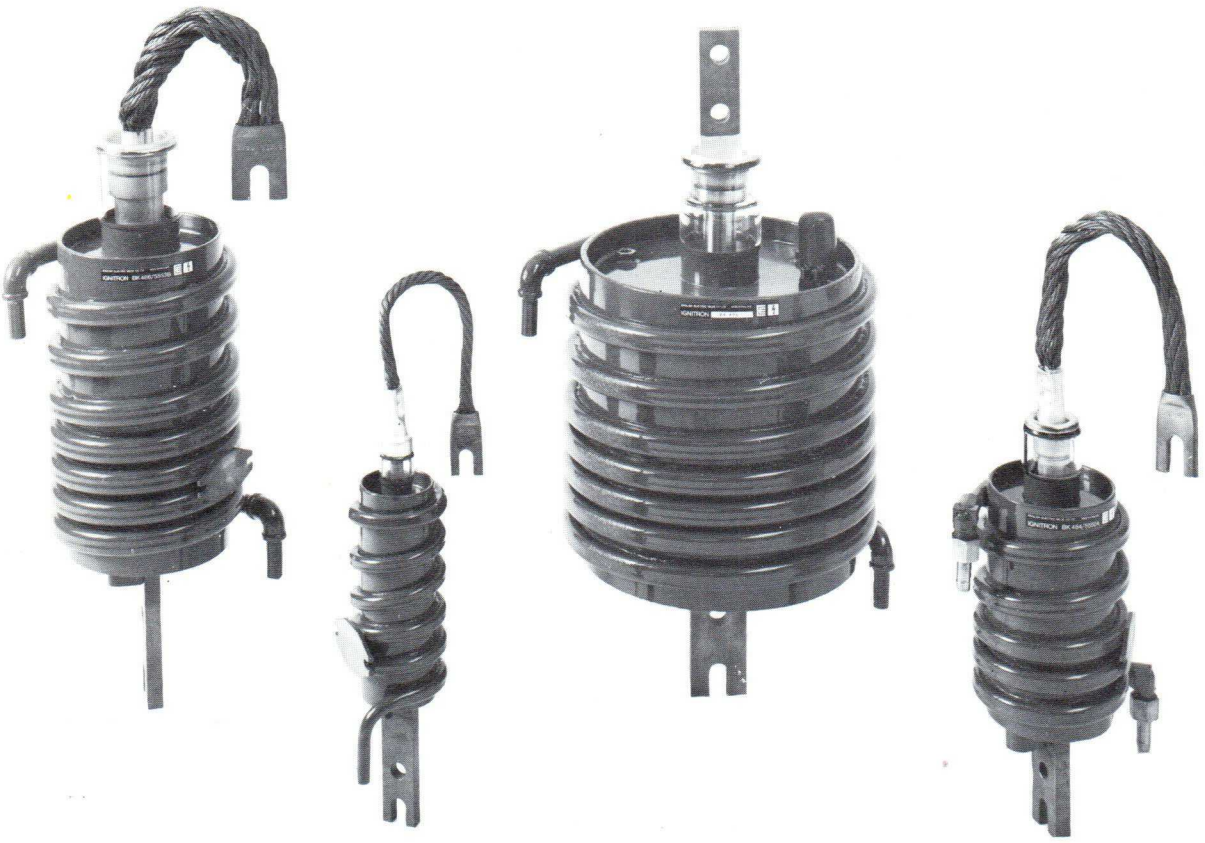
□ Single phase ratings are for two ignitrons in reverse parallel at any voltage from 250 to 600$V_{r.m.s.}$

EEV High Vacuum Rectifiers

Peak inverse voltage max (kV)	Type	Average anode current max (mA)	Peak anode current max (A)	Filament or heater Voltage (V)	Filament or heater Current (A)	Base
20	**3B24W (CV2858)**	60	0.3	2.5/5.0	6.0/3.0	B4G
40	**A292 (CV5998)**	1500☆	75★	12	14	Coaxial
45	**(CV2160) A207 (CV8051)**	350	1.1	4.0	12	G.E.S.
65	**A237 (CV482)**	250	1.5	4.0	12	G.E.S.

M-OV High Vacuum Rectifiers

Peak inverse voltage max (kV)	Type	Average anode current max (mA)	Peak anode current max (A)	Filament or heater Voltage (V)	Filament or heater Current (A)	Base
1.375	**CV4005‡**	75.0	0.230	6.3	0.6	B7G
7.1	**U19 (CV187)**	250	1.5	4.0	3.3	B4



A group of Ignitrons

☆ In charging diode service.
★ In overswing diode service.
‡ Special quality.

M-OV Mercury Vapour and Gas-filled Rectifiers

Average anode current max (A)	Type	Peak inverse voltage max (kV)	Peak anode current max (A)	Full load output 3-phase full wave		Filament or heater		Base
				Voltage (kV)	Current (A)	Voltage (V)	Current (A)	
0.25	**GU12 (CV32)■**	10	3.0	9.5	0.75	2.5	5.0	4 Pin UX
0.25	**GXU1 (CV1835)**	10	1.0	9.5	0.75	2.5	5.0	4 Pin UX
0.25	**GXU50 (CV8774)**	5.2	1.0	4.5	0.75	4.0	3.0	B4
0.25	**GXU51**	7.0	1.0	6.0	0.75	4.0	3.0	B4
1.25	**GXU2**	13	5.0	12.0	3.75	5.0	7.0	B4F
1.25	**(CV2399) GXU3 (CV8062)**	13	6.0	12.0	3.75	4.0	11	G.E.S.
1.25	**GXU4 (CV9006)**	13	5.0	12.0	3.75	4.0	7.0	G.E.S.
1.75	**GU25■**	13.5	7.0	12.8	4.5	5.0	7.0	B4F
3.0	**GXU5■**	10	18.0	9.0	9.0	2.5	30	Special 2-Pin
3.0	**GXU6 (CV5968)■**	15	12.0	14.0	9.0	2.5	30	Special 2-Pin

EEV Mercury Vapour and Gas-filled Rectifiers

Average anode current max (A)	Type	Peak inverse voltage max (kV)	Peak anode current max (A)	Full load output 3-phase full wave		Filament or heater		Base
				Voltage (kV)	Current (A)	Voltage (V)	Current (A)	
1.25	**AH238 (CV1629)**	13	5.0	12.4	3.75	4.0	7.0	G.E.S.
1.25	**(CV5) AH221 (CV1435)**	20	5.0	19	3.75	4.0	11	G.E.S.
2.0	**AH211A (CV532)**	16	8.0	15.2	6.0	2.5	30	B2D
3.0 5.0	**AH2511 (6693)**	15 2.5	12 20	14.3 2.4	9.0 15	5.0	11.5	B4D
6.0	**68506 (CV2775)**	Maximum d.c. output as half-wave rectifier 75V, 6A				2.3	18	G.E.S.
10	**AH205/ 857B (CV2673)**	22	40	21	30	5.0	30	Leads

M-OV Argon-filled Thyratron

Average anode current max (mA)	Type	Description	Anode voltage max (V)	Peak anode current max (A)	Heater ratings		Base
					(V)	(A)	
300	**GT1C (CV1128)△**	Triode	500	1	4	1.35	B5

■ Made to special order only.

§ Indirectly heated.

△ Maintenance type, not recommended for use in new equipment.

EEV Mercury Vapour and Gas-filled Thyratrons

Average anode current max (A)	Type	Filling	Peak inverse voltage max (kV)	Peak forward voltage max (kV)	Peak anode current max (A)	Filament or heater Voltage (V)	Filament or heater Current (A)	Base
0.025	**6D4 (CV1949)**	Argon	0.35	0.35	0.11	6.3§	0.25	B7G
0.045	**AFX234 (CV5023)**	Xenon	0.35	0.35	1.2	6.3§	0.49	B7G
0.5	**BT89 (CV2109)**	Xenon	1.5	1.0	2.0	2.5	5.0	B4
0.5	**BT19 (CV1144)**	M.V.	2.5	2.5	2.0	2.5	5.0	B4
0.5	**5557 (CV2957)**	M.V.	5.0	2.5	2.0	2.5	5.0	B4G
0.64	**AFX203 (CV2868)**	Xenon	0.34	0.17	7.7	2.5	5.0	B4G
1.25	**BT129**	M.V.	20	20	6.0	4.0	11	B4F
1.5	**BT95 (CV5141)**	M.V.	15	15	12	2.5	20	Leads
2.5	**BT5 (CV1147)**	M.V.	1.5	1.0	12.5	5.0§	4.7	B4G
2.5	**5559 (CV5027)**	M.V.	1.5	1.0	15	5.0§	4.7	B4G
2.5	**ZT1011 (CV5234)**	Xenon	1.5	1.5	30	2.5	8.5	B4G
3.2	**BT125**	M.V./Argon	1.5	1.5	40	2.5	12	B4D
6.0	**BT17**	M.V.	1.5	1.0	40	5.0§	10.5	Leads
6.4	**BT127**	M.V./Argon	1.5	1.5	80	2.5	21	B4D
12.5	**BT29**	M.V.	2.0	2.0	75	5.0§	20	Leads
12.5	**BT69**	M.V.	15	15	75	5.0§	20	Leads

A group of Rectifiers and Thyratrons

EEV Hydrogen Thyratrons — Glass Envelope — Pulse Modulator Service

Peak anode current max (A)	Type	Description	Peak forward voltage max (kV)	Average anode current max (A)	Peak output power (MW)	Heating (P_b) factor x 10^9 max†	Reservoir voltage/ current (V/A)	Heater voltage/ current (V/A)
40	(CV372) FX227 (CV3629*)	Triode	3.0	0.05	0.06	0.36	‡	6.3/2.7
85	FX2530/6777	Triode	8.0	0.1	0.34	2.5	‡	6.3/3.0
100	FX2517§	Triode	10	0.1	0.5	2.8	‡	6.3/6.1
100	(CV1787) FX2505 (CV5247)	Triode	10	0.125	0.5	2.8	‡	6.3/6.1
325	6587	Triode	16	0.225	2.0	3.9	‡	6.3/10.6
325	8503 (CV6022)§	Triode	16	0.25	2.6	3.9	‡	6.3/10.6
400	CX1191§	Tetrode	16	0.4	3.2	5.0	‡	6.3/12.5
500	CX1191A§	Tetrode	25	0.5	6.25	6.25	‡	6.3/12.5
500	FX2519A/5949A	Triode	25	0.5	6.25	6.25	4.5/3.0	6.3/18.5
500	CX1191D§●	Tetrode	35	0.5	8.0	8.0	‡	6.3/12.5
500	FX297	Triggered diode, 25kV P.I.V., 1.25A average current					‡	6.3/21.5
500	FX2503●	Triggered diode, 33kV P.I.V., 1.25A average current					‡	6.3/21.5
1000	CX1140 (CV8563)	Tetrode	25	1.25	12.5	9.0	‡	6.3/22
1000	CX1159 (CV9080)●	Tetrode	33	1.25	16.5	14	‡	6.3/22

A group of Hydrogen Thyratrons

EEV Hydrogen Thyratrons — Ceramic Envelope — Pulse Modulator Service

Peak anode current max (A)	Type	Description	Peak forward voltage max (kV)	Average anode current max (A)	Peak output power (MW)	Heating (P_b) factor x 10^9 max†	Reservoir voltage/ current (V/A)	Heater voltage/ current (V/A)
150	**CX1177**§	Tetrode	12	0.2	0.9	4.0	6.3/2.0	6.3/4.5
350	**CX1157 (CV6241)**§	Tetrode	20	0.5	3.5	7.0	6.3/1.5	6.3/7.5
500	**CX1530**	Tetrode	25	0.5	6.25	12	6.3/2.0	6.3/11
500	**CX1530D**●	Tetrode	35	0.5	8.75	12	6.3/2.0	6.3/11
1000	**CX1180**	Tetrode	25	1.25	12.5	12.5	6.3/6.0	6.3/11
3000	**CX1154**●	Tetrode	40	3.0	50	30	5.0/7.0	6.3/21.5
3000	**CX1154B**●	Double ended tetrode	35	3.0	50	30	5.0/7.0	6.3/21.5
3000	**CX1168**●	Two gap tetrode	80	3.0	100	70	5.0/7.0	6.3/21.5
3000	**CX1168B**●	Double ended two gap	70	3.0	88	60	5.0/7.0	6.3/21.5
3000	**CX1171**●	Three gap tetrode	120	3.0	150	70	5.0/7.0	6.3/21.5
3000	**CX1171B**●	Double ended three gap	105	3.0	130	60	5.0/7.0	6.3/21.5
3000	**CX1199**●	Four gap tetrode	160	3.0	200	70	5.0/7.0	6.3/21.5
3000	**CX1199B**●	Double ended four gap	140	3.0	175	60	5.0/7.0	6.3/21.5
6000	**CX1174**●	Tetrode	40	6.0	120	60	5.0/10	6.3/40
6000	**CX1174B**●	Double ended tetrode	35	6.0	100	60	5.0/10	6.3/40
6000	**CX1175**●	Two gap tetrode	80	6.0	200	140	5.0/10	6.3/40
6000	**CX1175B**●	Double ended two gap	70	6.0	175	120	5.0/10	6.3/40
6000	**CX1192**●	Three gap tetrode	120	6.0	360	140	5.0/10	6.3/40
6000	**CX1192B**●	Double ended three gap	105	6.0	315	120	5.0/10	6.3/40
6000	**CX1193**●	Four gap tetrode	160	6.0	400	140	5.0/10	6.3/40
6000	**CX1193B**●	Double ended four gap	140	6.0	350	120	5.0/10	6.3/40

† Product of peak forward voltage, peak current and pulse repetition rate.
* Near equivalent.
‡ Reservoir operates from cathode heater supply.
§ Rugged.
● Deuterium filled.

EEV Hydrogen Thyratrons — Metal Envelope — Pulse Modulator Service

Peak anode current max (A)	Type	Description	Peak forward voltage max (kV)	Average anode current max (A)	Peak output power (MW)	Heating (P_b) factor x 10^9 max†	Reservoir voltage/ current (V/A)	Heater voltage/ current (V/A)
3500	**CX1528/GHT8●**	Tetrode	40	5.0	50	60	6.3/5.0	6.3/36
7500	**CX1529/GHT9●**	Tetrode	40	15	150	150	6.3/8.0	6.3/90

Metal envelope Hydrogen Thyratron CX1529/GHT9

EEV Hydrogen Thyratrons — Metal Envelope — Inverter Service

Peak anode current max (A)	Type	Description	Peak forward and inverse voltage (kV)	Average anode current max (A)	Power output per pair (kW)	Reservoir voltage/ current (V/A)	Heater voltage/ current (V/A)
40	**CX1526/GHT11●**	Tetrode	35	20	320	6.3/5.0	6.3/36
120	**CX1527/GHT12●**	Tetrode	35	60	1000	6.3/8.0	6.3/90

† Product of peak forward voltage, peak current and pulse repetition rate.

● Deuterium filled.

TRANSMITTING TUBES

M-OV Power Triodes — Glass Envelope

Anode dissipation max (W)	Type	Output power (kW)	Anode voltage max (kV)	Frequency (MHz)	Amplification factor	Filament ratings (V)	Filament ratings (A)	Base
40	**DA42 (CV2394)**	0.2†	1.25	0.05	72	7.5	1.2	UX4
100	**DA100 (CV1219)*■**	0.3†	1.25	0.05	5.5	6.0	2.7	L4
125	**DET16**	0.35†	1.0	–	61	10	5.5	B4F
125	**DET21**	0.35†	3.0	–	13	10	5.5	B4F
275	**V1505**	1.0†	3.0	1.5	16	14	6.5	Special
380	**DET40**	1.2§	4.0	150	28	5.0	15	B5F
1000	**DET41**	3.2§	6.0	60	20	8.5	26	Special 4-Pin
1200	**EHT7B**	–	100	–	200	10	20	Flying lead
2000	**DET42■**	7.0§	6.0	50	20	75	50	Special 4-Pin

A group of Power Triodes

EEV Power Triodes — Glass Envelope

Anode dissipation max (W)	Type	Output power (kW)§	Anode voltage max (kV)	Frequency (MHz)	Amplification factor	Filament ratings (V)	Filament ratings (A)	Base
25	**(CV789) 3C24 (CV2736)**	0.1	2.0	60	25	6.3	3.0	Small UX4
1000‡ 500	**B1152●**	2.4‡ 1.5	5.0	50	24	5.0	32.5	Special 4 pin
1200	**B1510♦**	–	70	–	190	5.5–10	27–35	Leads
1500‡ 800	**B1153●**	4.6‡ 2.7	6.0	50	22	6.3	32.5	Special 4-Pin

★ Frequency: The lower value indicates the maximum operating frequency at full rating. Operation at the higher value is possible with suitable derating.

◇ Pulse only.

§ Under Class C unmodulated conditions.

△ Maintenance type, not recommended for use in new equipment.

‡ Duty factor 0.2 averaging time 5s.

* A pair of matched tubes with identical serial numbers can be supplied as the DA100B.

♦ BR1512 with mounting flange.

■ Made to special order only.

● Recommended for industrial heating service.

† Two tubes, class AB or B push pull.

♦ Control triode, oil immersed, for switching applications.

□ Integral filament leads.

EEV Power Triodes — Forced-air Cooled

Anode dissipation max (kW)	Type	Output power (kW) §	Anode voltage max (kV)	Frequency (MHz)★	Amplification factor	Filament ratings (V)	Filament ratings (A)
1.0	**BR1167**	–	2.0	30	12	6.0	10
1.5	**BR1512●** **BR1512A●◆**	2.7	5.5	250	20	6.3	33
2.5	**BR1195●**	4.6	7.2	85/160	20	6.3	33
3.0	**BR1126△**	7.0	6.0	30/110	30	15	39
3.5	**BR1131A△**	7.9	10	15/80	42	8.5	21
5.0	**BR1160 (CV8730)**	6.9	6.0	75/220	32	12.6	33
5.0	**BR1165 (CV3926)**	6.9	6.0	75/220	32	12.6	33
5.0	**BR1196●**	8.8	7.2	85/150	20	6.3	66
6.0	**BR1162 (CV5239)●**	10	7.2	30/85	32	12.6	33
8.0	**BR140**	–	12	15/40	45	19	75
8.0	**BR179 (CV2323)**	17	8.5	50/110	28	6.6	90
10	**BR1106**	15.5	6.6	30/220	30	5.0	175
10	**BR1124●**	20	8.5	100	37	6.0	115
10	**BR1513●** **BR1513F●□**	33	9.0	100	13	6.6	103
10	**BR1122 (CV10368)**	29	12	5.0/110	37	6.0	115
15	**BR161 (CV2322)**	50	12	30/50	45	9.0	175
15	**BR1121●**	50	10	50	38	6.6	230
15	**BR1182●**	52	10	50	38	6.6	230
20	**BR1102●**	53	12	50	42	8.2	230
20	**BR1183●**	74	10	50	38	8.2	230
20	**BR1143●**	77.5	10	10	37	12	240
27	**BR189 (CV5218)**	80	15	5.0/50	34	9.0	240
35	**BR1161 (CV9343)**	100	14	10/30	90	11	155
40	**BR194■**	115	15	5.0/30	34	13	240

Note Filament leads and grid connectors are available for most of the types listed above.

M-OV Power Triodes — Forced-air Cooled

Anode dissipation max (kW)	Type	Output power (kW)	Anode voltage max (kV)	Frequency (MHz)★	Amplification factor	Filament ratings (V)	Filament ratings (A)
0.4	**ACT25 (CV436)△**	0.256 §	1.0	500/1000	75	13.5	2.8
0.8	**ACT9△**	2.8 §	10	15/80	40	16	22
0.8	**ACT9B△**	2.8 §	10	15/80	40	16	22
1.5	**ACT27■**	1.25 §	1.5	160/500	50	15	6.7
1.5	**ACT28 (CV2163)■**	0.75 §	11◇	600	45	16	7.3
1.5	**ACT28A (CV5326)■**	300◇	13◇	600	45	16	7.3
2.0	**ACM3△**	1.0 §	2.0	600	14	6.0	17

EEV Power Triodes — Water Cooled

Anode dissipation max (kW)	Type	Output power (kW) §	Anode voltage max (kV)	Frequency (MHz)★	Amplification factor	Filament ratings (V)	Filament ratings (A)	Water jacket
2.5	**BW1195●** **BW1195J3●**	4.6	7.2	85/160	20	6.3	33	BW4088A Integral
5.0	**BW1196●** **BW1196J3●**	8.8	7.2	85/150	20	6.3	66	BW4088B Integral
6.0	**BW1165** **BW1165J3**	6.9	6.0	75/220	32	12.6	33	BW4088A Integral
6.0	**BW1162●** **BW1162J3●**	10	7.2	30/85	32	12.6	33	BW4088A Integral
7.5	**CAT100●**	27.5	10	40	23	6.5	95	–
10	**BW179**	17	8.5	50/110	28	6.6	90	BW4029
10	**BW1124●** **BW1124J1●** **BW1124J2●**	20	8.5	100	37	6.0	115	BW4029 Integral Integral
10	**BW1122**	29	12	5.0/110	37	6.0	115	BW4070
12	**BW140 (CV2871)△**	–	12	15/40	45	19	75	–
15	**BW1513J2●** **BW1513J2F●□**	33	9.0	100	13	6.6	103	Integral
15	**BW1121●** **BW1121J1●** **BW1121J2●**	50	10	50	38	6.6	230	BW4034 Integral Integral
15	**BW1182J1●** **BW1182J2●**	52	10	50	38	6.6	230	Integral
18	**BW153 (CV2872)△**	–	15	20/40	45	19	100	–
20	**BW1102●** **BW1102J2●**	53	12	50	42	8.2	230	BW4028 Integral
20	**BW1176J1●** **BW1176J2●**	82	10	20	38	8.2	230	Integral
30	**BW1143●** **BW1143J2●**	77	10	10	37	12	240	BW4050 Integral
30	**BW1183J1●** **BW1183J2●**	74	10	50	38	8.2	230	Integral
35	**BW189■**	80	15	5.0/50	34	9.0	240	BW4050
50	**BW194**	115	15	5.0/30	34	13	240	BW4027
80	**BW1184J2●**	120	14.4	30	30	12.2	255	Integral
100	**BW1144**	200	14	27	34	9.6☆	290☆	BW4035
120	**BW1185J2●**	240	16.8	30	41	12.6	380	Integral
175	**BW1156●**	250	14	27	23	12.2☆	290☆	BW4035
175	**BW1186J2●**	250	14	27	32	18	330	Integral

Note Filament leads and grid connectors are available for most of the types listed above.

★ Frequency: The lower value indicates the maximum operating frequency at full rating. Operation at the higher value is possible with suitable derating.

□ Integral filament leads.

§ Under Class C unmodulated conditions.

● Recommended for industrial heating service.

△ Maintenance type, not recommended for use in new equipment.

☆ Per section.

‡ Single unit, separate condenser required.

▲ Single unit with integral condenser.

** Double unit with integral condenser.

■ Made to special order only.

EEV Power Triodes — Vapour Cooled

Anode dissipation max (kW)	Type	Output power (kW) §	Anode voltage max (kV)	Frequency (MHz)★	Amplification factor	Filament ratings (V)	Filament ratings (A)	Boiler unit
10	**BY1124**●	20	8.5	100	37	6.0	115	BY4048A‡ BY4064▲
10	**BY1122**	29	12	5.0/110	37	6.0	115	BY4048A‡ BY4064▲
18	**BY1121**●	50	10	50	38	6.6	230	BY4032** BY4033▲ BY4063‡
25	**BY1102**●	53	12	50	42	8.2	230	BY4030** BY4031▲
35	**BY1143**●	77	10	10	37	12	240	BY4037‡ BY4038▲ BY4038A**
35	**BY189A**■	80	15	5.0/50	34	9.0	240	BY4037‡ BY4038▲ BY4038A**
50	**BY194**●	115	15	5.0/30	34	13	240	BY4039▲ BY4049‡
60	**BY1161**	120	14	10/30	90	11	155	BY4059‡ BY4093▲
125	**BY1144**● **BY1144L**●□	200	14	27	34	9.6☆	290☆	BY4036▲ BY4060‡
125	**BY1156**●	250	14	27	23	12.2☆	290☆	BY4036▲ BY4060‡

Note Filament leads and grid connectors are available for most of the types listed above.

Power Triodes BY1122, BW1186J2, BW1196J3, BW1513J2

EEV Power Tetrodes — Glass Envelope

Anode dissipation max (W)	Type	Output power (W) §	Anode voltage max (V)	Frequency (MHz)★	Amplification factor (g1–g2)	Filament or heater (V)	Filament or heater (A)	Base
2 x 10	**C1134 (CV2799)††**	48♦	600	150/600	8.0	12.6 6.3	0.65 1.3	B7A
2 x 10	**C1534††**	48♦	600	150/600	8.0	28.0 14.0	0.3 0.6	B7A
2 x 20	**C178A/ 5894 (CV2797)††**	90♦	600	250/500	8.0	6.3 12.6	1.8 0.9	B7A
50	**4D32 (CV3543)**	140	750	60	10	6.3	3.75	B7A
125	**C1108 (CV2130)**	375	3000	120/200	6.2	5.0	6.5	B5F
250	**C1112 (CV2131)**	1000	4000	75/120	5.1	5.0	14.1	B5F
400	**C1136 (CV5959)**	1100	4000	110	5.1	5.0	14.5	B5F

M-OV Power Tetrodes — Glass Envelope

Anode dissipation max (W)	Type	Output power (W) §	Anode voltage max (V)	Frequency (MHz)★	Amplification factor (g1–g2)	Filament or heater (V)	Filament or heater (A)	Base
37.5	**TT21 (CV8286)**	174	1250	30/60	8	6.3	1.6	B8.0
37.5	**TT22**	174	1250	30/60	8	12.6	0.8	B8.0
100	**TT100**	200	1250	30/100	5.5	6.3 12.6	3.6 1.8	B12F

M-OV Power Tetrodes — Conduction Cooled

Anode dissipation max (kW)	Type	Output power (kW)	Anode voltage max (kV)	Frequency (MHz)★	Amplification factor (g1–g2)	Filament or heater (V)	Filament or heater (A)
0.25	**CCS1■⊕**	0.4 §	2.0	175/500	5	6.0	2.6
0.25	**CCS2■**	0.4 §	2.0	175/500	5	6.0	2.6
0.30	**YL1550**	0.06◇	2.0	80◇	6	6.0	2.4

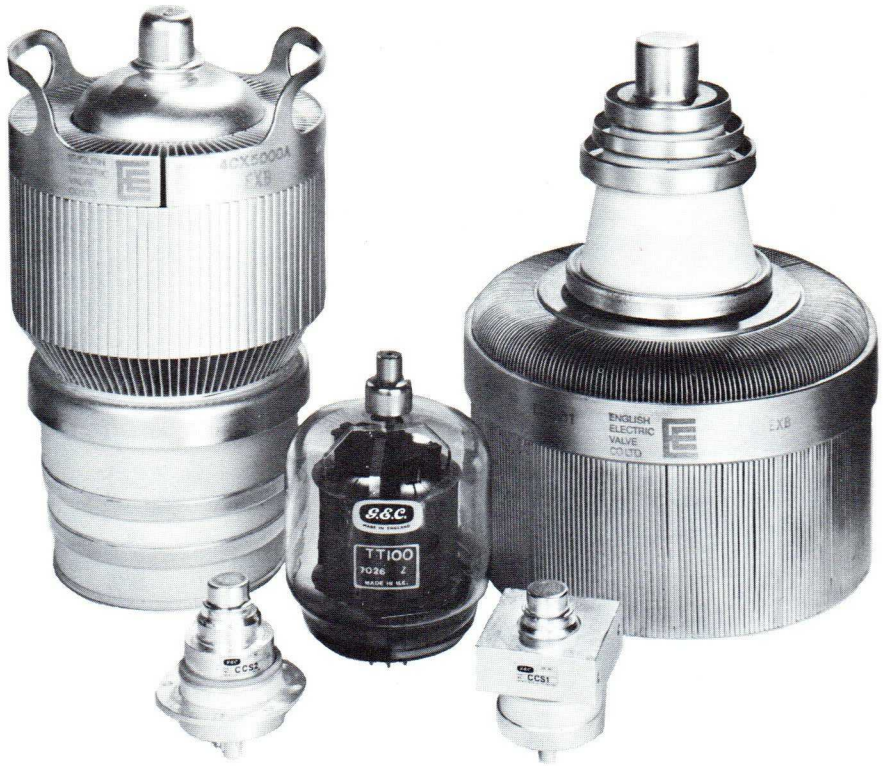
EEV Pulse Amplifier Tetrodes — Glass Envelope

Pulse output power (kW)	Type	Anode dissipation max (W)	Anode voltage max D.C. (kV)	Pulse anode current max (A)	Heater ratings (V)	Heater ratings (A)	Base
130	**C1148**	40	14	12	6.3	5.0	B5F
205	**C1150/1 (CV427)**	60	17.5	15	26	2.15	B4A
205	**C1166 (CV10404)**	60	17.5	15	6.3	9.0	B5F
330	**C1149/1 (CV6131)**	60	20	18	26	2.15	B4A

★ Frequency: The lower value indicates the maximum operating frequency at full rating. Operation at the higher value is possible with suitable derating.

M-OV Power Tetrodes — Forced-air Cooled

Anode dissipation max (kW)	Type	Output power (kW) §	Anode voltage max (kV)	Frequency (MHz)★	Amplification factor (g1–g2)	Filament or heater (V)	Filament or heater (A)
0.25	**4CX250B**	0.4	2.0	175/500	5	6.0	2.6
3.0	**(CV5219) ACS4 (CV10369)■**	4.1	5.0	75/220	8.5	6.3	30.5



A group of Power Tetrodes

EEV Power Tetrodes — Forced air Cooled

Anode dissipation max (kW)	Type	Output power (kW) §	Anode voltage max (kV)	Frequency (MHz)★	Amplification factor (g1–g2)	Filament or heater (V)	Filament or heater (A)
1.0	**4CX1000A**	3.2†	3.0	110	–	6.0	9.0
1.5	**4CX1500B**	2.7†	3.0	30	–	6.0	9.0
1.5	**CR1502**	2.2‡	4.0	260	16	4.2	53
5.0	**4CX5000A (CV8295)**	16	7.5	30/110	4.5	7.5	75
8.0	**CR1505**	11‡	8.5	110	7.2	6.3	120
10	**CR192A (CV8244)**	9.0	6.9	60/220§	10	5.0	175
10	**4CX10,000D (CV6184)**	16	7.5	30/110	4.5	7.5	75
12	**6166A**	12	7.5	60/220§	10	5.0	175
12	**CR1501**	13‡	9.0	260	8.5	8.0	120
15	**4CX15,000A**	36.5	10	110	4.5	6.3	160
35	**4CX35,000C (CV11107)**	82	20	30	4.5	10	300

⊕ A heat conducting, electrically insulating, anode mounting block HC1 is available.

† Two tubes, class AB1, audio.

‡ Class B service.

■ Made to special order only.

◇ In mobile radio applications, with V_a = 800V, I_k = 165mA, V_{drive} = 40V crest, I_{g1} ⩾ 4mA.

†† VHF double beam tetrode.

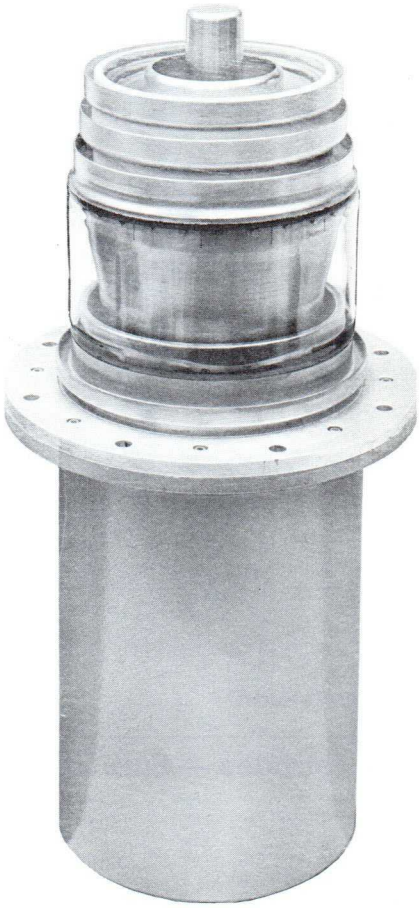
◆ With 2 sections in push-pull.

§ Under Class C unmodulated conditions.

EEV Power Tetrodes — Water Cooled

Anode dissipation max (kW)	Type	Output power (kW) §	Anode voltage max (kV)	Frequency (MHz)★	Amplification factor (g1–g2)	Filament ratings (V)	Filament ratings (A)	Water jacket
10	**4CW10,000A**	16	7.5	30/110	4.5	7.5	75	Integral
20	**CAS1■**	13	8.0	220	5.5	10	110	Integral
25	**4CW25,000A**	36.5	10	110/225	4.5	6.3	160	Integral
200	**CW1506J2**	220*	15	30	4.0	20	340	Integral

Power Tetrodes CY1172 and CW1506J2



EEV Power Tetrodes — Vapour Cooled

Anode dissipation max (kW)	Type	Output power (kW) §	Anode voltage max (kV)	Frequency (MHz)	Amplification factor (g1–g2)	Filament ratings (V)	Filament ratings (A)	Boiler unit
75	**CY1170J**	82	15	30	4.5	10	300	Integral
150	**CY1172**	220*	15	30	4.0	20	340	CY4120

§ Under Class C unmodulated conditions.

■ Made to special order only.

* Class C, anode and screen modulated.

★ Frequency: The lower value indicates the maximum operating frequency at full rating. Operation at the higher value is possible with suitable derating.

RECEIVING TUBES

M-OV Noise Diodes

Maximum frequency (MHz)	Type	Anode current max (mA)	Anode dissipation max (W)	Anode voltage max (V)	Heater voltage max (V)	Heater current (A)	Base
220	(CV2171) A2087 (CV8733)■	20	2.0	200	4.3	0.6	B7G
2500	CV2341■	200	40†	400	4.7	3.8	Coaxial 70Ω

M-OV Triodes

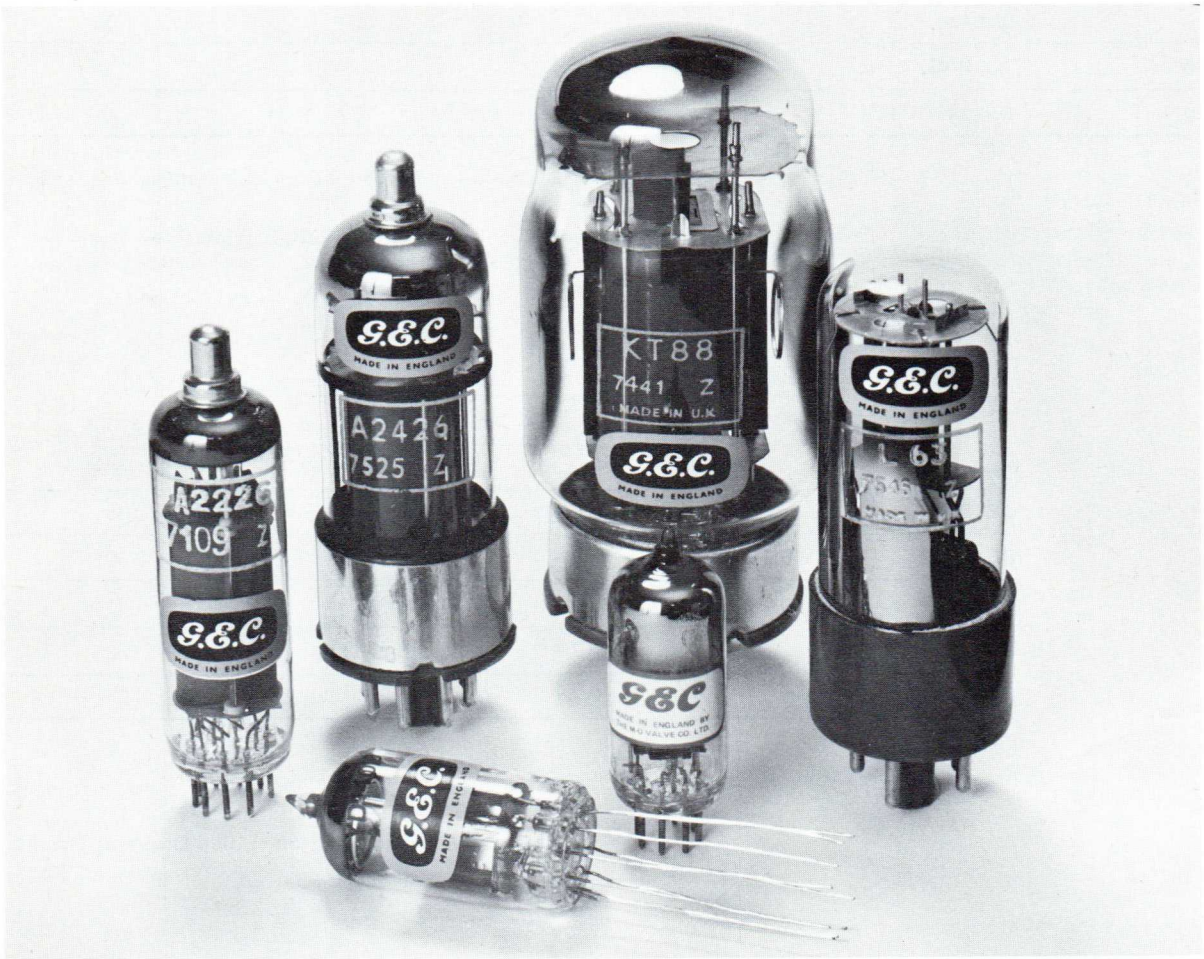
Anode dissipation max (W)	Type	Anode voltage max (V)	Anode current (mA)	Mutual conductance (mA/V)	Filament ratings (V)	Filament ratings (A)	Base
2.5	A2521 (CV8064)◆	250	16	15	6.3	0.3	B9A
2.5	A2599 (CV5242)■◆	250	16	15	6.3	0.3	B9A
2.5	A2913 (CV5413)■‡◆	200	16	14	6.3	0.37	B7G
2.5	A2975 (CV10813)■◆	200	16	14	6.3	0.37	B7G
2.5	A3341	200	16	14	6.3	0.37	Flying lead
2.5	CV2453◆	250	16	15	6.3	0.37	B9A
2.5	L63 (CV1067)△	250	9.0	2.6	6.3	0.3	B8.0
2x3.5	A2900 (CV6091)*‡	1000	2x10	2x2.6	6.3 12.6	0.4 0.2	B9A
3.5	YD1400■‡◆	500	10	12	6.3	0.3	B9A/F
4.0	5842 (CV8198)◆ CV3789◆	250	25	25	6.3	0.3	B9A
2x13	(CV2984) 6080 (CV10332)*▲	250	2x125	2x7.0	6.3	2.5	B8.0
2x13	6080WA (CV5008)*‡▲	250	2x125	2x7.0	6.3	2.5	B8.0
15	(CV4079) A2293 (CV8089)▲	500	100	12	6.3	0.95	B9A
15	CV4079‡▲	500	100	12	6.3	0.95	B9A

M-OV Tetrodes

Anode dissipation max (W)	Type	Anode voltage max (V)	Anode current (mA)	Mutual conductance (mA/V)	Filament ratings (V)	Filament ratings (A)	Base
4.0	D3a●	220	22	35	6.3	0.32	B9A
30	KT66 (CV1075)¶	550	85	7.3	6.3	1.6	B8.0
35	(CV345) 12E1 (CV8025)▲	800	200	13	6.3	1.6	B8.0
42	KT88 (CV5220)¶	800	150	12	6.3	1.6	B8.0

M-OV Pulse Tetrodes and Pentodes

Anode dissipation max (W)	Type	Anode voltage max (kV)	Anode current pulse (A)	Amplification factor	Filament ratings (V)	Filament ratings (A)	Base
12	A2226 (CV2231)■	10	3.0	8.5	6.3	1.2	B9A
12	A3042■	5.0	4.0	8.5	6.3	1.2	B9A
15	(CV4082)‡ A2426 (CV8978)	8.0	7.5	7.5	6.3	1.3	B8.0



A group of M-OV Triodes, Tetrodes and Pentodes

M-OV Pentodes

Anode dissipation max (W)	Type	Anode voltage max (V)	Anode current (mA)	Mutual conductance (mA/V)	Filament ratings (V)	Filament ratings (A)	Base
1.0	CV4085	300	3.0	2.0	6.3	0.2	B9A
4.0	E280F●	220	20	26	6.3	0.315	B9A
4.2	E282F●	200	35	26	6.5	0.35	B9A
5.0	(CV5060) Z759 (CV8082)●	300	20	15	6.3	0.6	B9A
9.0	A2134 (CV2179)■▲	500	55	12	6.3	0.64	B7G
9.0	A3283■▲	300	55	12	13	0.3	B7G
9.0	CV4062■‡▲	300	55	12	6.3	0.64	B7G

♦ Low noise type.
■ Made to special order only.
‡ Special quality type.
△ Maintenance type, not recommended for use in new equipment.
* Double triode.
▲ Series stabilizer type.
● Wideband amplifier type.
¶ Audio type.
† Forced-air cooled.

M-OV Conduction-cooled Disc-seal Tubes

Anode dissipation max (W)	Type	Output power (W)	Anode voltage max (V)	Frequency (MHz)★	Amplification factor	Filament ratings (V)	Filament ratings (A)
10	A3343♦†	–	350	–	70	6.3	0.4
10	DET22 (CV273)	4.0	350	1000/3000	30	6.3	0.4
10	DET23 (CV354)♦	–	350	–	70	6.3	0.4
10	DET29 (CV2397) DET29M CV5400	1.5	450	4000/5000	55	6.3	0.5
20	A3012■●	–	–	–	–	6.3	1.0
20	DET24 (CV397)	10	400	1000/2000	28	6.3	1.0

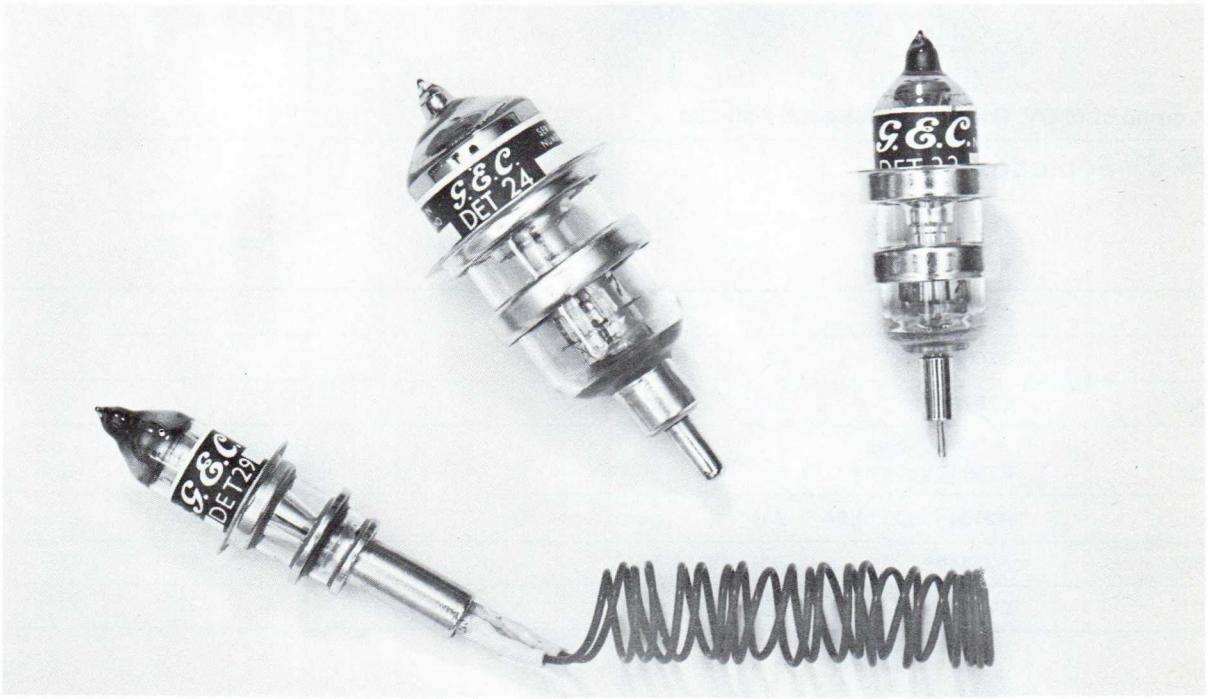
The DET22 series of disc-seal triodes consists of a range of mechanically identical tubes with electrical characteristics selected into various bands.

The DET22 (CV273) is the basic type and has the widest characteristic spread, while the DET22D, E, R and S have more tightly controlled characteristics. All the types give similar performance, but one or other of the selections may be preferred when the range of circuit adjustment is limited.

	at V_a = 250V			
	at I_a = 40mA	at I_a = 20mA		$c_{a\text{-}g}$ (pF) (measured on a cold unscreened tube)
Type	$-V_g$ (V)	$-V_g$ (V)	g_m (mA/V)	
DET22	–	5.0 ± 4	6.0 ± 3	1.05 ± 0.35
DET22D■	5.5 ± 2.5	8.0 ± 2	6.0 ± 2	1.05 ± 0.35
DET22E■	2.0 ± 1	6.0 ± 1	6.0 ± 2	1.05 ± 0.35
DET22R■	–	6.7 ± 2.2	6.3 ± 1.7	1.1 ± 0.1
DET22S■	–	6.7 ± 2.2	6.3 ± 1.7	0.95 ± 0.25

Details of other DET22 variants are available on request.

A group of M-OV conduction-cooled Disc-seal Triodes



★ Frequency: The lower value indicates the maximum operating frequency at full rating. Operation at the higher value is possible with suitable derating.

♦ Low noise type.
● UHF diode.
■ Made to special order only.
† Similar to DET23 but with noise factor strictly controlled.

EEV Voltage Stabilizers

Operating voltage approx (V)	Type	Striking voltage max (V) ○	Striking voltage max (V) ●	Tube current range (mA)	Regulation max (V)	Base
75	QS75/20 (CV284)□	110	160	2–20	6.0	B7G
75	0C2 (CV8766)	115	145	5–30	4.5	B7G
75	QS75/60 (CV434)	117	–	5–60	5.0	B8G
78	75C1 (CV4080)	115	115	2–60	8.0	B7G
90	QS1215 (CV5173)	115	115	1–40	12	B7G
95	QS95/10 (CV286)	110	–	2–10	5.0	B7G
108	QS108/45 (CV422)	120	–	5–45	5.0	B8G
108	(CV1833) 0B2 (CV8162)	127	210	5–30	3.5	B7G
108	(CV4028) 0B2WA (CV4101)‡	130	130	5–30	3.0	B7G
120	S130P (CV45)	135	–	10–75	10	B4
150	(CV4020) (CV4100) 0A2WA (CV8168)‡	165	165	5–30	5.0	B7G
150	QS150/15 (CV287)	170	–	2–15	5.0	B7G
150	QS150/45 (CV395)	170	–	5–45	5.0	B8G
150	QS1203 (CV4053)‡	180	225	2–15	4.5	B7G/F
150	150C4 (CV10664)	185	185	5–30	5.0	B7G
150	(CV1832) 0A2 (CV8161)	185	225	5–30	6.0	B7G

EEV Voltage Reference Tubes

Operating voltage approx. (V)	Type	Striking voltage max (V) ○	Striking voltage max (V) ●	Tube current range (mA)	Regulation max (V)	Base
85	QS1209/5651 (CV449, CV2012)	115	160	1–10	4.0	B7G
85	(CV4048) QS1212 (CV5285)‡	115	115	1–10	4.0	B7G
85	QS1213 (CV4054)‡	115	115	1–10	4.0	B7G/F
150	QS1200 (CV2225)	180	225	5–15	5.0	B7G

‡ This is a rugged and reliable type.
○ In normal lighting.
● In total darkness.
□ Also CV5083 (with an operating voltage of 70V).

M-OV Stabilizer Tubes — Corona

Stabilized output voltage (V)	Type	Operating current Min (μA)	Operating current Max (μA)	Continuous current max (μA)	Typical incremental impedance (kΩ)	Temperature coefficient (%°C)	Terminals
350	**SC1/350 (CV2456)**	2.0	425	325	17.5	0.01	
400	**SC1/400 (CV2457)**	2.0	450	350	20	0.01	
500	**SC1/500**	8.0	475	375	25	0.01	
600	**SC1/600 (CV2458)**	8.0	500	400	30	0.01	Top cap CT1
800	**SC1/800 (CV2459)**	22	575	475	40	0.01	
1000	**SC1/1000 (CV2460)**	28	650	550	50	0.01	
1200	**SC1/1200 (CV2461)**	32	725	625	60	0.01	Base B7G
1400	**SC1/1400 (CV2462)**	32	800	700	70	0.01	
1600	**SC1/1600 (CV6065)**	32	850	750	80	0.01	
1800	**SC1/1800 (CV6066)**	32	900	800	90	0.01	
2000	**SC1/2000 (CV6067)**	32	950	850	100	0.01	
2500	**SC2/2500**	25	1500	1000	210	0.02	
3000	**SC2/3000 (CV5844)**	25	1750	1000	250	0.02	Top cap CT1
3500	**SC2/3500**	25	1750	1000	280	0.02	
4000	**SC2/4000**	25	1750	1000	320	0.02	Base B9A
5000	**SC5/5000***	50	2000	1000	300	0.02	
6000	**SC5/6000* (CV8530)**	50	2000	1000	375	0.02	CT1 both ends
6800	**SC5/6800***	50	2000	1000	450	0.02	
5000	**SC6/5000■**	25	2000	1000	300	0.007	
7000	**SC6/7000■**	25	2000	1000	500	0.007	
10000	**SC6/10000■**	25	2000	1000	700	0.005	Anode BS448 CT2
14000	**SC6/14000■**	25	2000	1000	1100	0.005	
12000	**SC7/12000■**	25	2000	1000	950	0.005	
14000	**SC7/14000■**	25	2000	1000	1100	0.005	
15000	**SC7/15000■**	25	2000	1000	1200	0.005	Cathode body
16000	**SC7/16000■**	25	2000	1000	1300	0.005	

Standard voltage steps only are listed. Other voltages can be made available to special order.

SC6 between 10 and 14.9kV is available but is only suitable for use in an oil bath.

An encapsulated version of the SC7, ref. SC7/E is available for use under conditions of high humidity.

* A special quality version of the SC5, for use under conditions of shock and vibration, is available as the QSC5 (CV8960).

■ Made to special order only.

VACUUM CAPACITORS

EEV High Vacuum Variable Capacitors — Glass Envelope

Capacitance range (pF)	Type	Equivalent	Peak r.f. working voltage max. (kV)	R.F. current max. up to 27MHz ($A_{r.m.s.}$)	Shaft turns in range	Mounting flange
5.0–30	**U30/15/20**	–	15	20	10.4	Integral
8.0–50	**U50/15/30**	–	15	30	10.4	Integral
4.0–50	**U50/20/40**	–	20	40	22	MA52, MA164
6.0–60	**U60/30/75**	–	30	75	35	MA54, MA125
4.0–75	**U75/15/40**	–	15	40	22.5	MA52, MA164
16–80	**U80/15/40**	–	15	40	10.4	Integral
16–90	**U90/15/40**	–	15	40	10.4	Integral
7.0–100	**U100/20/40**	–	20	40	22.5	MA52, MA164
8.0–100	**U100/25/75**	–	25	75	35	MA54, MA125
7.0–150	**U150/15/40**	–	15	40	23.5	MA52, MA164
10–150	**U150/25/75**	–	25	75	36	MA54, MA126
5.0–200	**U200/10/40**	–	10	40	22	MA52, MA164
7.0–200	**U200/15/40**	–	15	40	24	MA52, MA164
7.0–200	**U200/15/40A**	–	15	40	24	MA52, MA125
10–200	**U200/20/75**	–	20	75	35.5	MA54, MA125
10–250	**U250/15/75J**	UXCF250	15	75	22	MA54, MA457☆
7.0–300	**U300/10/40**	–	10	40	23	MA52, MA164
10–300	**U300/15/40**	–	15	40	22.5	MA52, MA164
11–300	**U300/20/75**	–	20	75	36	MA54, MA126
11–300	**U300/20/75A**	–	20	75	36	MA54, MA126
7.0–400	**U400/10/40**	–	10	40	23.5	MA52, MA164
7.0–400	**U400/10/40A**	–	10	40	23.5	MA52, MA164
5.0–500	**U500/3/40J**	USL500	3.0	40	19	Integral, MA281
5.0–500	**U500/5/40J**	USL500	5.0	40	19	Integral, MA281
10–500	**U500/10/40**	–	10	40	23.5	MA52, MA164
10–500	**U500/10/40A**	–	10	40	23.5	MA52, MA125
12–500	**U500/15/75**	–	15	75	36	MA54, MA125
12–500	**U500/15/75A**	–	15	75	36	MA54, MA125
15–500	**U500A/15/75J**	UXCF500	15	75	25.5	2 MA126☆
12–600	**U600/8/40**	–	8.0	40	23.5	MA52, MA164
5.0–650	**U650/3/40**	–	3.0	40	19	Integral, MA281
15–750	**U750/10/40**	–	10	40	23	MA52, MA164
15–750	**U750/10/40A**	–	10	40	35.5	MA52, MA164
10–750	**U750/10/75J**	UCSXF750	10	75	27	MA54, MA125
20–750	**U750/15/75**	–	15	75	36.5	MA54, MA126
7.0–1000	**U1000/3/40**	–	3.0	40	15.5	MA52, MA296
7.0–1000	**U1000/3/40A**	–	3.0	40	15.5	MA52
7.0–1000	**U1000/3/40C**	–	3.0	40	15.5	MA52, MA296

☆ Supplied with the capacitor.
† 21 turns over extended range.

EEV High Vacuum Variable Capacitors — Glass Envelope continued

Capacitance range (pF)	Type	Equivalent	Peak r.f. working voltage max. (kV)	R.F. current max. up to 27MHz ($A_{r.m.s.}$)	Shaft turns in range	Mounting flange
20–1000	**U1000/10/75J**	UCSX1000	10	75	36	MA54, MA125
7.0–1000	**U1000A/3/40J**	UCSL1000 special	3.0/6.0	40	Pull rod	Integral, MA296
7.0–1000	**U1000A/3/40JA**	UCSL1000 special	3.0/6.0	40	Pull rod	Integral, MA296
7.0–1000	**U1000A/3/40JB**	UCSL1000	3.0/6.0	40	18	MA52, MA296
7.0–1000	**U1000A/3/40JD**	UCSL1000	3.0/6.0	40	18†	MA52, MA296
12–1000	**U1000A/10/75J**	UCSXF1000	10	75	31	MA54, MA125
15–1000	**U1000B/10/75**	–	10	75	37	MA54, MA125
15–1200	**U1200/10/75J**	UCSXF1200	10	75	35	MA54, MA125
25–1500	**U1500/8/75**	–	8.0	75	36	MA54, MA126
10–2000	**U2000/3/40**	UCSL2000	3.0	40	32	MA52, MA125
10–2000	**U2000/3/40A**	–	3.0	40	25	MA52, MA125
10–2000	**U2000/3/40B**	–	3.0	40	Pull rod	MA100, MA125
10–2000	**U2000/3/40C**	–	3.0	40	32	MA52, MA125
50–2000	**U2000/8/75J**	UCSXF2000	8.0	75	33	MA54, MA126
50–2000	**U2000/8/75JA**	UCSXF2000	8.0	75	35	MA54, MA126
30–2000	**U2000A/8/75**	–	8.0	75	35	MA54, MA126
30–2000	**U2000A/8/75A**	–	8.0	75	34	MA54, MA126
15–3000	**U3000/3/40J**	UCSL3000	3.0	40	26	MA52, MA125
20–4000	**U4000/2/40**	–	2.0	40	30	MA52, MA125

A group of EEV Glass Envelope Variable Capacitors

EEV High Vacuum Variable Capacitors — Miniature Ceramic Envelope

Capacitance range (pF)	Type	Equivalent	Peak r.f. working voltage max. (kV)	R.F. current max. up to 16MHz ($A_{r.m.s.}$)	Shaft turns in range	Mounting flange
6.5–500	**UCM500/5/25**	CMV1–500	5.0	25	20	Integral, metric fittings
6.5–500	**UCM500A/5/25**	CMV1–500	5.0	25	Pull rod	Integral
12–2000	**UCM2000/5/40**	CMV1–2000	5.0	40	Pull rod	Integral
20–2000	**UCM2000A/5/40**	CMV1–2000	5.0	40	20	Integral, metric fittings

EEV High Vacuum Variable Capacitors — Ceramic Envelope

Capacitance range (pF)	Type	Equivalent	Peak r.f. working voltage max. (kV)	R.F. current max. up to 27MHz ($A_{r.m.s.}$)	Shaft turns in range	Mounting flange
15–200	**UC200/15/70**	CVDD200	15	70	24.5	Integral
15–250	**UC250/20/125**	–	20	125	33	Integral
15–250	**UC250/25/125J**	CVFP250	25	125	27	Integral
10–250	**UC250/30/150J**	CVHP250	30	150	55	Integral
10–250	**UC250/30/150JA**	VMMHC250*	30	150	55	Integral
10–250	**UC250/30/150JD**	VMMHC250*	30	150	55	Integral
10–300	**UC300/10/70J**	CVDD300	10	70	19	Integral
25–450	**UC450/30/150J**	CVHP450	30	150	42	Integral
25–450	**UC450A/30/150**	VMMHC450*	30	150	52	Integral
30–650	**UC650/30/150J**	CVHP650	30	150	56	Integral
20–750	**UC750/20/150J**	CVFP750	20	150	43.5	Integral
35–880	**UC880/15/125**	–	15	125	34	Integral
25–1000	**UC1000/8/125J**	CVDD1000	8.0	125	24	Integral
25–1000	**UC1000/10/125J**	CVDD1000	10	125	24	Integral
35–1000	**UC1000/15/125**	–	15	125	38.5	Integral
35–1000	**UC1000/20/150J**	CVFP1000	20	150	49	Integral
60–1000	**UC1000A/20/150**	VMMHC1000*	20	150	56	Integral
35–1500	**UC1500/8/125J**	CVDP1500	8.0	125	24	Integral
35–1500	**UC1500/10/125J**	CVDP1500	10	125	24	Integral
100–1500	**UC1500/20/150J**	CVFP1500	20	150‡	63	Integral
50–2300	**UC2300/8/125J**	CVDP2300	8.0	125	35	Integral
50–2300	**UC2300/10/125J**	CVDP2300	10	125	35	Integral
25–2500	**UC2500/5/60J**	CVCC2500	5.0	60	Pull rod	Integral

* Adaptor kit available for EEV type.

‡ Up to 16MHz.

EEV High Vacuum Variable Capacitor — Water Cooled

Capacitance range (pF)	Type	Equivalent	Peak r.f. working voltage max. (kV)	R.F. current max. up to 16MHz ($A_{r.m.s.}$)	Shaft turns in range	Mounting flange
100—1000	**UCW1000/30/500**	CV3W1000	30	500	25	Integral

Vacuum Capacitors UF1000/8/75, UC450/30/150J and UCM500/5/25

EEV High Vacuum Fixed Capacitors — Glass Envelope

Capacitance (pF)	Type	Equivalent	Peak r.f. working voltage max. (kV)	R.F. current max. up to 27MHz ($A_{r.m.s.}$)	Mounting flange
6.25	**UF6/15/7**	X—6.25	15	7.0	—
10	**UF10/15/7J**	X—10	15	7.0	—
12	**UF12/20/40**	VCCA12	20	40	MA281 or MA282
25	**UF25/20/40**	VCCA25	20	40	MA281 or MA282
50	**UF50/10/40**	JCS1-50	10	40	MA164
50	**UF50/20/40**	VCCA50	20	40	MA281 or MA282
75	**UF75/10/40**	JCS1-75	10	40	MA164
100	**UF100/10/40**	JCS1-100	10	40	MA164
150	**UF150/10/40**	JCS1-150	10	40	MA164
250	**UF250/8/40**	JCS1-250	8.0	40	MA164
300	**UF300/10/50**	—	10	50	MA125
300	**UF300/15/75**	—	15	75	MA125
500	**UF500/10/50**	—	10	50	MA125
750	**UF750/8/75**	—	8.0	75	MA125
800	**UF800/3/50J**	JCSL800	3.0	50	—
900	**UF900/3/50J**	JCSL900	3.0	50	—
1000	**UF1000/8/75**	—	8.0	75	MA125

EEV High Vacuum Fixed Capacitors — Ceramic Envelope

Capacitance (pF)	Type	Equivalent	Peak r.f. working voltage max. (kV)	R.F. current max. up to 27MHz ($A_{r.m.s.}$)	Mounting flange
6.5	**UFC6/30/140J**	CFHE6.5	30	140	Integral
12	**UFC12/30/140J**	CFHE12	30	140	Integral
18.5	**UFC18/30/140J**	CFHE18.5	30	140	Integral
34	**UFC34/30/140J**	CFHE34	30	140	Integral
40	**UFC40/30/140J**	CFHE40	30	140	Integral
50	**UFC50/30/140J**	CFHE50	30	140	Integral
100	**UFC100/15/80**	–	15	80	Integral
100	**UFC100/15/140**	–	15	140	Integral
100	**UFC100/30/120J**	CFHD100	30	120	Integral
150	**UFC150/15/140**	–	15	140	Integral
450	**UFC450/12/125J**	CFED450	12	125‡	Integral
450	**UFC450/15/125J**	CFED450	15	125‡	Integral
500	**UFC500/12/125J**	CFED500	12	125‡	Integral
500	**UFC500/15/125J**	CFED500	15	125‡	Integral
750	**UFC750/15/125**	–	15	125	Integral
1000	**UFC1000/15/125**	–	15	125	Integral
1000	**UFC1000/20/200**	–	20	200‡	Integral
1000	**UFC1000/30/200J**	CFHP1000	30	200	Integral
1000	**UFC1000A/12/125J**	CFED1000	12	125‡	Integral
1000	**UFC1000A/15/125J**	CFED1000	15	125‡	Integral
1500	**UFC1500/12/125**	–	12	125	Integral
2000	**UFC2000/8/125J**	CFDP2000	8.0	125	Integral
2000	**UFC2000/20/200J**	CFFP2000	20	200‡	Integral
3000	**UFC3000/7/125**	–	7.0	125	Integral

‡ Up to 16MHz.

MICROWAVE TUBES

EEV Plug-in TR Tubes

Broad-band, low loss, plug-in tubes requiring no external connections

Frequency range (MHz)	Type	Maximum peak power (MW)	Maximum mean power (kW)	Maximum breakdown power (kW)	Maximum recovery period to −3dB (μs)
100–500	**BS708ϕ**	0.225	0.45	1.0	300†▲
S-Band	**BS702 (CV2285)**	2.5	–	10	30†
2755–2915	**BS718 (CV2378)**	0.005	–	–	25†
2755–2915	**BS720 (CV2379)**	3W	–	–	25†
2000–4000	**(CV294) BS710 (CV2157)**	2.0	–	–	10†
2000–4000	**BS840 (CV6110)**	10	25	20	200
2500–4000	**BS730**	2.5	3.75	–	250
2600–3950	**BS714 (CV6129)**	0.005	5W	–	30
2600–3950	**BS732 (CV5398)**	0.005	–	–	16†
2600–3950	**BS716 (CV2430)**	0.5	0.5	–	15†
2600–4100	**BS724* BS726* BS728* (CV2488)**	15W	15mW	500mW	70†
2000–5500	**BS940**	1.25	1.5	10	100
2000–5500	**BS986**	2.0	1.5	5.0	150
2000–12000	**BS836 (CV6086)**	0.25	0.25	20	8.0
2000–12000	**BS838 (CV2482)**	0.5	0.5	20	8.0
2000–12000	**BS138**	1.0	1.0	20	25
2000–12000	**BS834 (CV6028)**	2.5	3.0	20	25
2000–12000	**BS880**	3.0	3.0	20	25

EEV Primerless Pre-TR and Protector Tubes — L-Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (W)			
1230–1365	**BS876●**	10	2300	30	1.25	0.7	10
1250–1350	**BS128☆**	2500	2000	20	1.25	0.4	20
1250–1350	**BS910††**	2500	100	0.3	1.3	0.5	20
1250–1350	**BS912††**	5000	5000	1.0	1.3	0.5	20
1240–1365	**BS872**	10	700	1.0	1.25	0.3	20
1240–1370	**BS870**	2500	–	–	1.25	0.4	20
L-Band□	**BS798★**	120	–	1.0	1.3	1.0	3.0◇
L-Band#	**BS898★**	120	–	1.0	1.3	1.0	3.0◇

† To −6dB.
ϕ For use in coaxial waveguide.
* Supplied as matched set of 3 tubes.
▲ With sweep voltage of 50V min.
● Coaxial.
†† Twin tube.
☆ Half height waveguide.
□ Any 50MHz band.
Any 100MHz band.

EEV Primerless Pre-TR and Protector Tubes—S-Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (mW)			
2700–3100	**BS824**	250	600	900	1.25	0.4	15
2700–3100	**BS832**	250	600	900	1.25	0.4	15
2700–3100	**BS846**	250	600	900	1.25	0.4	15
2700–3100	**BS904**♦	10	4000	–	1.25	0.7	10
2700–3100	**BS916**††	2000	10	20	1.25	0.4	20
2700–3200	**BS172**	250	600	900	1.25	0.4	15
2700–3200	**BS848**	250	600	900	1.25	0.4	15
2900–3230	**BS990**††	1300	–	–	–	0.6	90

EEV TR Tubes—S-Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (mW)			
2700–2900	**BS324**	1250	25	100	1.2	1.0	25
2750–2860	**BS104 (CV2181)**	1250	25	100	1.2	1.0	25
2670–2960	**BS58**	500	30	130	1.3	0.8	15
2850–3050	**BS456**	1250	25	100	1.2	0.8	15
2840–3100	**BS800**	1250	25	100	1.2	0.8	15
2825–3125	**BS170**	750	–	70	1.3	1.0	15
2925–3075	**BS390 (CV9442)**	1250	25	100	1.33	1.0	25
3000–3050	**BS204 (CV5990)**	1250	25	100	1.2	1.0	25
2900–3200	**BS110**	100	30	130	1.35	1.0	5.0
3020–3080	**BS894**♦●	1000	15	60	1.2	0.5	10
3020–3080	**BS994**♦●	1000	10	60	1.2	0.8	10
3055–3105	**BS286 (CV5991)**	1250	25	100	1.2	1.0	25
2600–3960■	**BS852**‡●	1000	–	50	–	1.5	10
3275–3325	**BS924 (CV2303)**	250	–	–	1.1	1.0	3.0†
3230–3380	**BS430 (CV9444)**	1250	25	100	1.33	1.0	25
3450–3620	**BS946**	1250	25	100	1.33	1.0	25
3490–3770	**BS932 (CV2481)**	30	25	–	1.2	0.8	10†
3600–3780	**BS426 (CV9443)**	1250	25	100	1.33	1.0	25

‡ Tunable, double cavity, TR tube-filter.
● Primerless.
■ Any 10% tuning range.
♦ Tunable marine radar.
◊ To −1dB.
★ Fixed tuned device with gas tube, double PIN switch and trigger probe.

EEV Primerless TR Limiter Tubes—S-Band

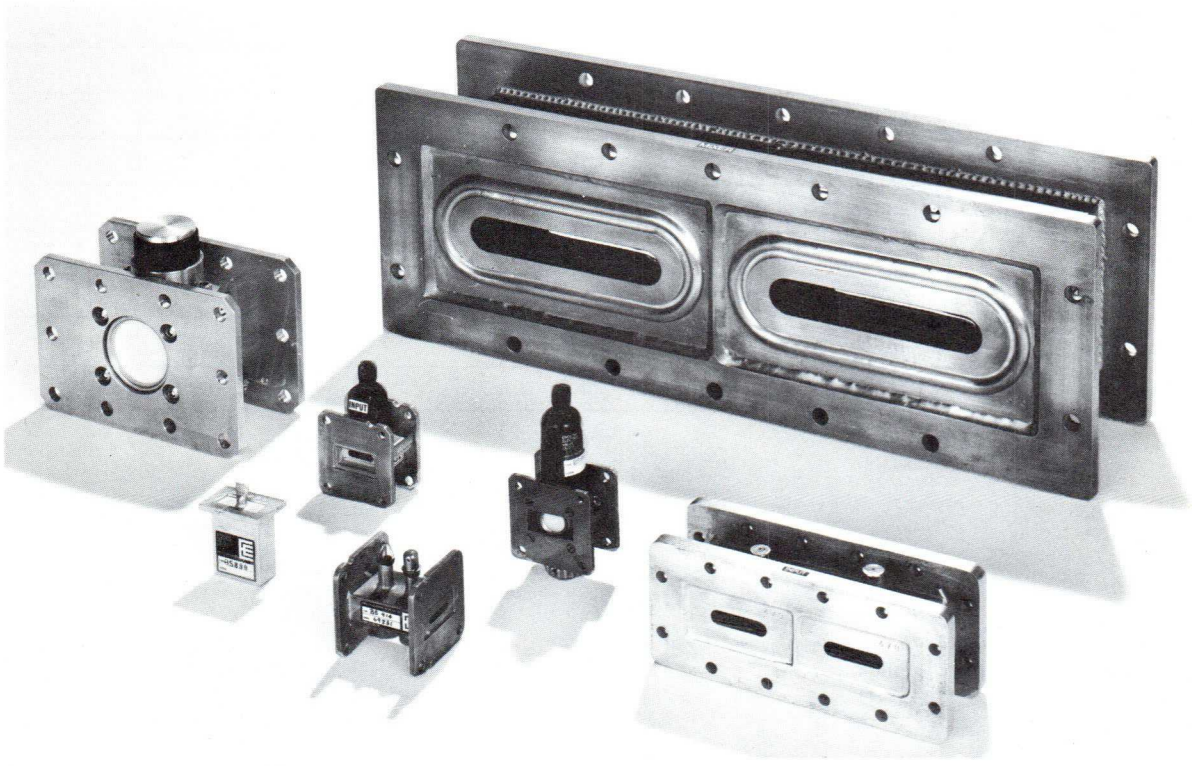
Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (mW)			
2750–2860	**BS102**	1250	6.0	100	1.2	0.8	15
3030–3070	**BS194**	1000	2.0	20	1.3	0.8	10

EEV Primerless Pre-TR and Protector Tubes—C-Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (mW)			
5250–5710	**BS858**††	1000	25	–	1.3	0.5	15
5300–5700	**BS856**	250	400	–	1.25	0.5	15
5450–5850	**BS220**	250	400	–	1.25	0.5	15
5450–5850	**BS180**††	1000	25	–	1.3	0.5	15
5450–5850	**BS224**††	1000	25	–	1.3	0.5	15

EEV TR Tube and Primerless TR Limiter Tubes—C-Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (mW)			
5350–5500	**BS190**	250	40	–	1.2	0.6	15
5250–5750	**BS966**◇	500	30	110	1.25	0.8	10
5450–5825	**BS226**	250	5.0	50	1.4	1.2	8.0



A selection of Duplexer Devices

EEV Primerless Pre-TR and Protector Tubes—X-Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (mW)			
8950–9350	**BS228**	250	600	1000	1.4	0.5	2.0
7000–11500	**BS956**	0.1	–	300	–	0.5	70
8500–10000	**BS928**	200	600	1000	1.4	0.8	2.0
8500–10000	**BS930††**	200	5.0	20	1.4	0.8	2.0
8500–10000	**BS970‡‡**	150	5.0	30	1.4	0.8	2.0

EEV TR Tubes — X-Band

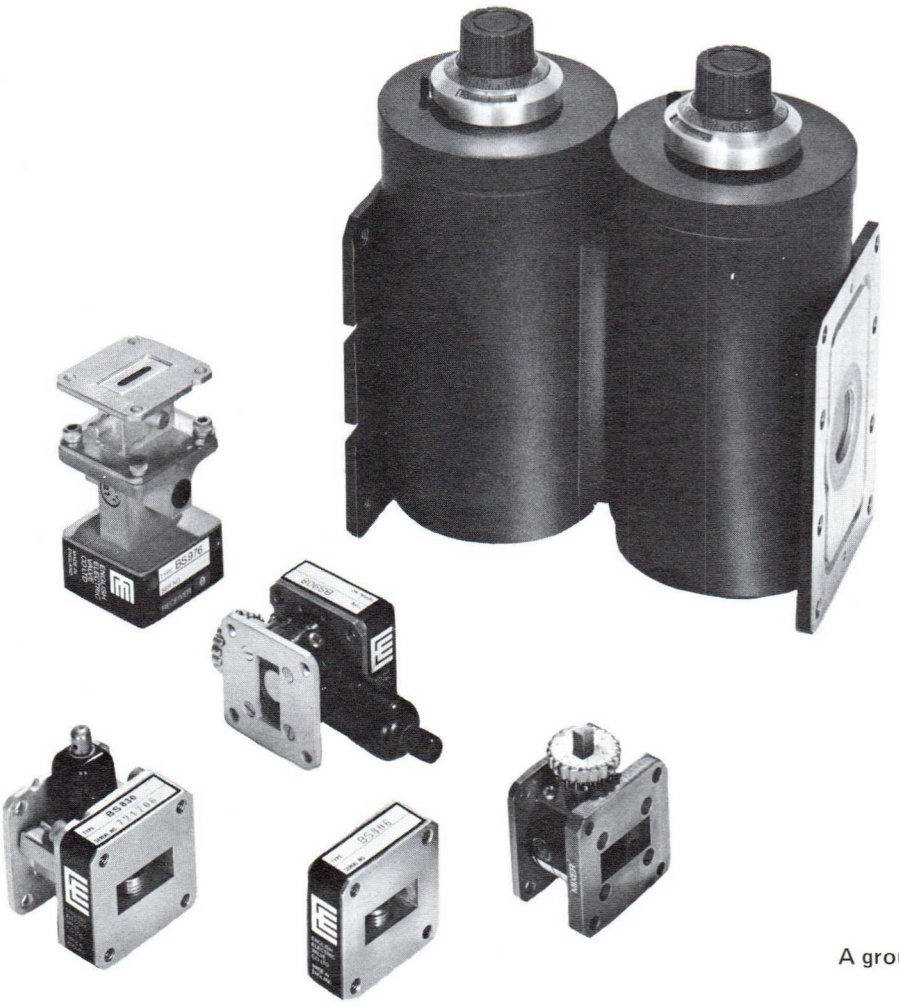
Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (mW)			
8500–9100	**BS158 (CV2307)**	200	20	100	1.2	0.8	3.0
8500–9100	**BS440 (CV6132)**	200	20	100	1.2	0.8	2.0
8500–9300	**BS202 (CV2312)****	200	30	100	1.3	0.8	3.0
8825–9225	**BS860**	100	15	100	1.3	0.8	4.0
8490–9578	**BS914**	200	20	70	1.4	0.7	4.0
8500–9600	**BS314***	250	20	–	1.4	1.0	2.0
8500–9600	**BS316††***	250	10	15	1.3	1.0	3.0
8500–9600	**BS918††**	250	10	15	1.3	1.0	3.0
8400–9800	**BS842**	200	20	100	1.5	1.0	4.0
9000–9300	**BS462 (CV3840)♦**	75	8.0	30	1.4	1.0	6.0
9000–9600	**BS156 (CV2306)**	200	20	100	1.2	0.8	3.0
9340–9420	**BS892**	50	15	100	1.4	1.0	3.0
9300–9500	**BS192**	200	–	–	1.3	0.7	3.0
9300–9500	**BS196**	200	20	70	1.4	0.7	4.0
9300–9500	**BS450**	100	15	100	1.3	0.8	3.0
9200–9600	**BS466♦**	75	8.0	30	1.4	1.0	6.0
9320–9500	**BS52 (CV1841)**	200	25	100	1.2	0.7	3.0
9320–9500	**BS52A**	200	25	100	1.2	0.7	3.0
9310–9510	**BS452**	100	15	100	1.3	0.8	4.0
9245–9575	**BS810 (CV1923)♦**	75	8.0	30	1.4	0.8	1.5†
9405–9690	**BS822♦**	75	8.0	30	1.4	0.8	1.5†
9180–10000	**BS200 (CV2311)****	200	30	100	1.3	0.8	3.0

◇ TR tube.
† To −6dB.
†† Twin tube.
‡‡ Twin tube, E-plane.

* Controlled phase recovery.
** Two primers.
♦ Tunable marine radar.

EEV Primerless TR Limiter Tubes—X-Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (mW)			
8900–9100	**BS162**	40	5.0	30	1.4	0.8	3.0
8980–9180	**BS500**	100	5.0	30	1.4	1.0	3.0
9000–9500	**BS968**	50	5.0	30	1.3	1.0	3.0
9000–9500	**BS974**‡‡	150	5.0	30	1.3	1.0	3.0
9000–9500	**BS976**	Matched pair of BS968 and BS974 for use in monopulse radars.					
9220–9280	**BS274**	100	5.0	30	1.4	0.8	3.0
9240–9340	**BS254**	110	5.0	30	1.4	0.8	3.0
9000–9600	**BS264**	100	5.0	30	1.4	1.0	3.0
9000–9600	**BS258**	100	5.0	30	1.4	1.0	3.0
9250–9350	**BS122**	40	5.0	30	1.4	0.8	5.0
9305–9405	**BS952**	60	10	50	1.3	0.7	3.0
9325–9425	**BS108**	60	20	50	1.4	0.8	3.0
9300–9500	**BS206**	100	10	30	1.4	1.0	3.0
9300–9500	**BS260**	100	5.0	30	1.4	0.8	3.0
9300–9500	**BS256**	100	5.0	30	1.4	0.8	3.0
9300–9500	**BS958**	40	5.0	30	1.4	0.8	3.0
9400–9700	**BS232**	40	5.0	30	1.4	0.8	3.0



A group of Duplexer Devices

EEV TR Limiter Tubes— X-Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to −3dB (μs)
			Spike (nJ/pulse)	Total (mW)			
8500–9100	**BS816 (CV6178)**	200	2.0	30	1.3	0.8	3.0
8750–8850	**BS960**	200	10	30	1.2	0.8	0.25
8600–9150	**BS950**	50	2.0	30	1.4	1.0	6.0
8500–9300	**BS820**	200	2.0	30	1.3	0.8	3.0
8500–9500	**BS828**	200	2.0	30	1.3	1.0	1.0
8800–9250	**BS886**	200	2.0	40	1.4	1.0	3.0
9300–9390	**BS882**	20	5.0	50	1.4	0.8	4.0
9000–9700	**BS814 (CV6192)**	200	2.0	30	1.3	0.8	3.0
9345–9405	**BS962**	200	2.0	30	1.3	0.8	3.0
9300–9500	**BS130**	200	2.0	30	1.3	0.8	3.0
9300–9500	**BS830**	200	2.0	30	1.3	0.7	3.0
9250–9550	**BS908♦**	75	2.0	20	1.4	1.0	6.0
9320–9500	**BS812**	200	2.0	30	1.3	0.8	3.0
9310–9510	**BS844**	100	2.0	30	1.3	1.0	3.0
9300–9900	**BS826 (CV6207)**	200	1.2	30	1.3	0.8	3.0
9500–9700	**BS896**	200	1.0	30	1.3	0.8	3.0
9400–10000	**BS818 (CV6206)**	200	2.0	30	1.3	0.8	3.0

EEV ATR (TB) Tubes—X-Band

Resonant frequency (MHz)	Type	Operating power (kW)	Maximum loaded Q	Maximum V.S.W.R.	Maximum equivalent conductance	Maximum recovery loss at 2.0μs (dB)
8775	**BS118 (CV2309)**	4–50	6.5	1.11	0.1	2.0
9025	**BS248**	4–50	6.5	1.1	0.1	2.0
9080	**BS82 (CV463)**	4–50	6.5	1.15	0.1	2.0
9240	**BS84 (CV462)**	4–50	6.5	1.1	0.1	2.0
9300	**BS412**	4–250	6.5	1.1	0.1	2.0
9325	**BS116 (CV2308)**	4–50	6.5	1.11	0.1	2.0
9375	**BS92 (CV461)**	4–50	6.5	1.1	0.1	2.0
9375	**BS310 (CV6070)**	4–250	6.5	1.1	0.1	2.0
9410	**BS48 (CV460)**	4–50	6.0	1.1	0.045	2.0
9600	**BS114 (CV2274)**	4–50	6.5	1.1	0.05	2.0
9850	**BS148**	4–50	6.5	1.1	0.1	2.0

‡‡ Twin tube, E-plane.
† To −6dB.
♦ Tunable marine radar.

EEV Varactor Limiters

Centre frequency (MHz)	Type	Bandwidth to V.S.W.R. 1.4:1 (MHz)	Peak input power (W)	Attenuation range (dB)	Maximum insertion loss (dB)
S-Band*	**BS168**	150	50	0–16	0.4
C-Band*	**BS306**	200	50	0–16	0.4
X-Band*	**BS806**	500	50	0–16	0.5
Q-Band*	**BS66**	1000	50	0–12	0.8

EEV Tunable Filter Cavities

Frequency range (MHz)	Type	Waveguide size	Q factor	Used with tube type
S-Band	**BS652**	WG10	–	Any
2000–4000	**BS854**	WG10	180	BS902
9255–9565	**BS888**	WG16	240	BS810

EEV TR Tubes—Q(K_a)-Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to –3dB (μs)□
			Spike (nJ/pulse)	Total (mW)			
30000–33000◇	**BS78**	75	20	50	1.3	1.0	6.0
30000–36000◇	**BS60**☆	75	2.0	40	1.3	1.5	6.0
30000–36000◇	**BS70**★	75	2.0	40	1.3	1.5	6.0
33000–36000◇	**BS80**	75	20	50	1.3	1.0	6.0
34550–35250	**BS72**★	50	2.0	–	1.3	1.3	0.3

EEV Solid State Microwave Switches

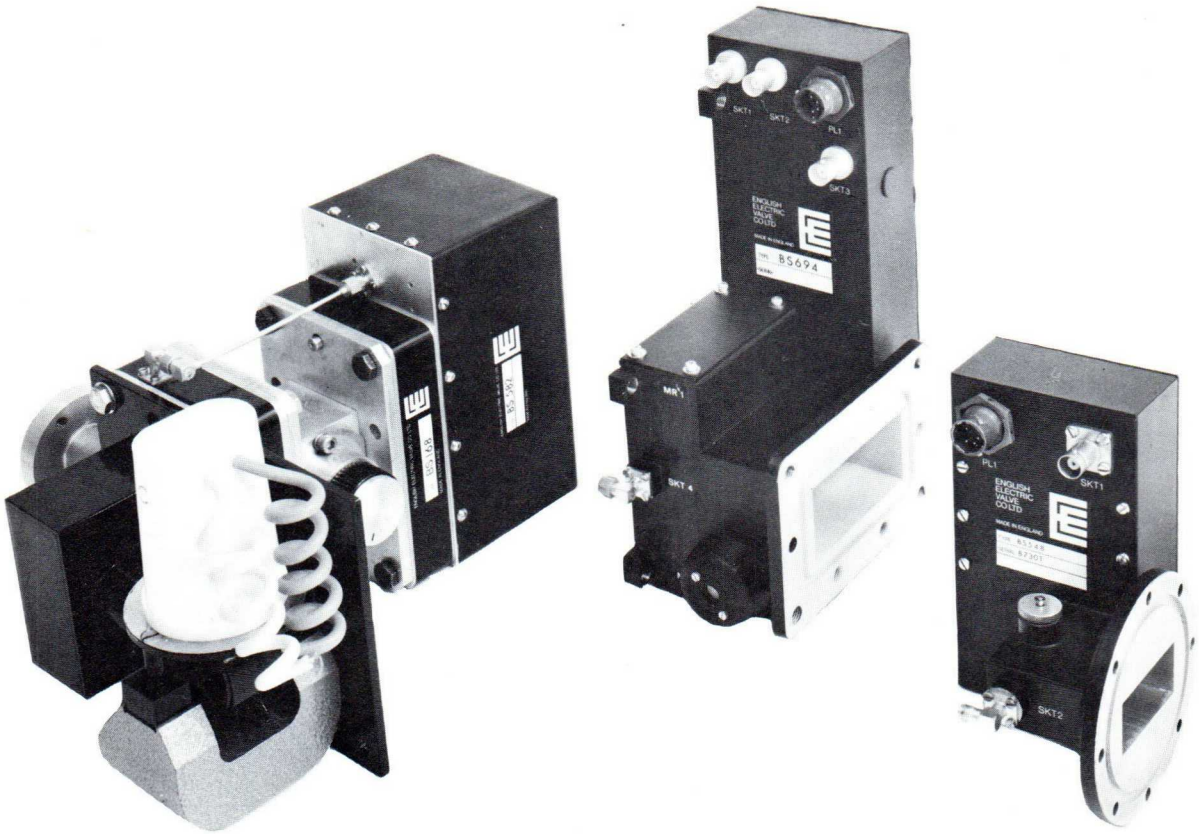
Frequency range (MHz)	Type	Bandwidth (MHz)	Attenuation at centre frequency (dB)	Maximum peak pulsed line power (W)	Typical operating voltage (V)	Maximum operating current (mA)
S-Band*	**BS338**	200	1–25	500	0.85	30
2925–3075	**BS392**	150	0.25–25	500	0.85	30
2940–3060	**BS864**	120	0.25–8.0	500	0.85	50
3230–3380	**BS804**	150	0.25–25	500	0.85	30
3600–3770	**BS802**	170	0.25–25	500	0.85	30
X-Band*	**BS460**	100	1–25	500	0.85	30
X-Band*	**BS120**	300	1–25	500	0.85	30
9500–9800	**BS208**	300	1–40	700	‡	‡
9600–9900	**BS166**	300	0.75–30	130	‡	‡

Note A pulse generator type BS402 for use with the waveguide switches listed above is available.

EEV Balanced Duplexers

EEV manufactures a range of balanced duplexers designed to meet customers' individual requirements at frequencies from 1.0 to 17GHz. The basic balanced duplexer consists of two 3dB hybrid couplers, with a twin pre-TR tube and a high power load. The couplers can be supplied in various configurations e.g. E-plane, H-plane etc. In addition, TR tubes, protector tubes, TR limiters, PIN switches or other devices can be supplied for receiver protection. Typical balanced duplexer configurations are given below; enquiries are invited regarding the best arrangement of devices for particular applications.

Frequency range (MHz)	Type	Dual pre-TR tube	Peak power (MW)	V.S.W.R.	Recovery period (μs)	Insertion loss (dB)
1215–1365	**BS624**	BS910 BS912	0.15 6.0	1.3 1.3	12 20	0.5 0.5
2700–3100	**BS608**	BS916	2.0	1.25	20	0.4
5250–5710	**BS630**	BS858	1.0	1.3	15	0.5
8500–10000	**BS616**	BS930	0.2	1.4	2.0	0.8



S-Band R.F. Head BS598, Mixer Receivers BS694 and BS548

EEV R.F. Heads

EEV can supply a complete range of compact, low noise r.f. heads in the frequency range from 1.0 to 10 GHz, for applications ranging from marine radar to sophisticated military systems. The r.f. head includes magnetron, duplexer (either conventional T, balanced or using circulators), TR limiter, balanced or single ended mixer, local oscillator (Gunn diode or transistor depending on frequency) and 1st stage i.f. amplifier. Additional facilities are available, including a.f.c. and a.g.c. if required.

All r.f. heads produced by EEV are designed to meet individual customer requirements.

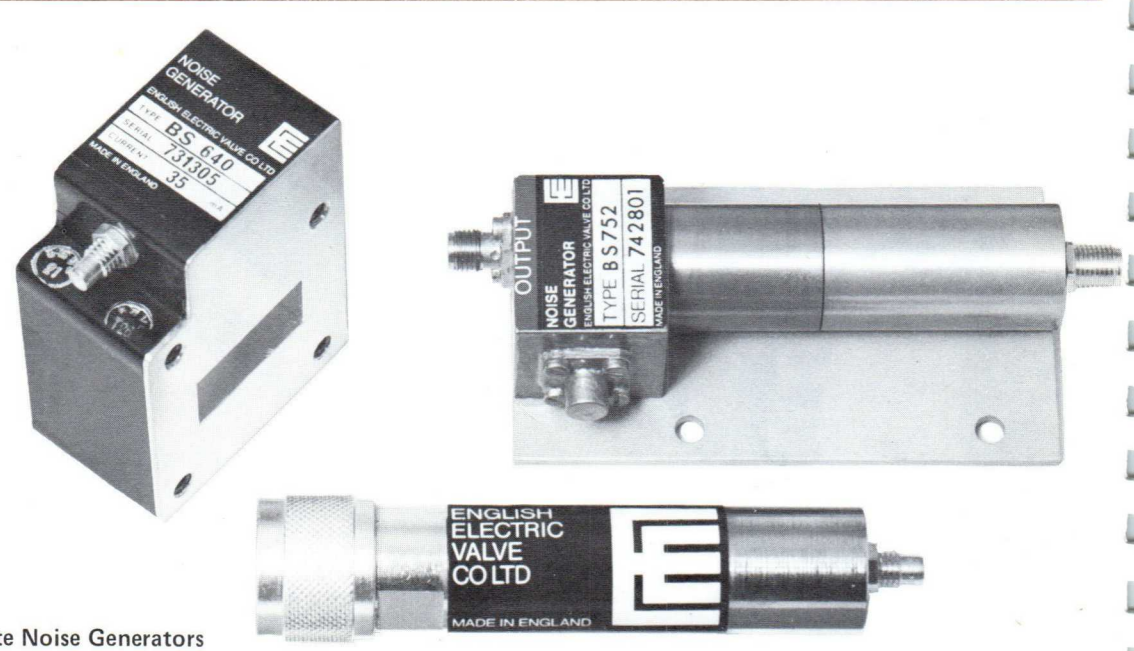
The components for a typical 25kW r.f. head type BS598 are given below; the peak power may be substantially increased by using a higher power magnetron.

Magnetron (25kW)	**M5020**	Varactor limiter	**BS168**
Duplexer	**BS748**	Mixer receiver	**BS582**
TR tube	**BS894**	Local oscillator	**BS742**

◇ 10% bandwidth.
□ Dependent on power level.
☆ Primerless TR limiter.
★ Primed TR limiter.
* Preset to customers' requirements.
‡ Self biasing.

EEV Solid State Noise Generators—Waveguide

Frequency range (MHz)	Type	Excess noise ratio (dB)	Waveguide size 153 IEC–	Transmission or terminated	Operating current (mA)	Typical voltage (V)	Power supply type
2700–3100	**BS774**	9.0	R32	Transmission	★	★	★
3100–3500	**BS676**	16.0	R32	Transmission	10	23	BS690, BS692
5450–5825	**BS756**	15.0	R48	Transmission	15	23	BS690, BS692
8500–9100	**BS660**	16.0	R100	Transmission	30	21	BS690, BS692
8800–9200	**BS658**	16.0	R100	Transmission	30	21	BS690, BS692
9000–9600	**BS662**	16.0	R100	Transmission	30	21	BS690, BS692
9000–9600	**BS750**	20.0	R100	Transmission	40	23	BS690, BS692
9300–9700	**BS640**	16.0	R100	Transmission	30	21	BS690, BS692
9400–9700	**BS678**	13.2	R100	Transmission	30	23	BS690, BS692
9500–10000	**BS764**	15.5	R100	Terminated	35	23	BS690, BS692
13000–16000‡	**BS674**	16.0	R140	Transmission	35	23	BS690, BS692
33000–36000†	**BS648**	25.0	R320	Terminated	32	–34	–
34750–35250	**BS758**	25.0	R320	Terminated	35	–34	–



Solid State Noise Generators

EEV Solid State Noise Generators—Coaxial

Frequency range (MHz)	Type	Excess noise ratio (dB)	Output conn-ector	Transmission or terminated	Operating current (mA)	Typical voltage (V)	Power supply type
1000–4000	**BS644**	27.0	Type N	Terminated	15	21	BS690, BS692
2700–3200	**BS776**	25.0	SMA	Terminated	10 max	28	–
2700–3500	**BS762**	32.0	Type N	Terminated	10	21	BS690, BS692
3000–3500	**BS698**	27.0	Type N	Terminated	15	21	BS690, BS692
4500–5500	**BS760**	25.0	SMA	Terminated	15 max	28	–
1000–10000	**BS646**	16.0	Type N	Terminated	20	22	BS690, BS692
9500–10000	**BS752**	36.0	SMA	Terminated	30	22	BS690, BS692
9800–10000	**BS778**	36.0	SMA	Terminated	30 max	28	–

† 3% bandwidth.
‡ 5% bandwidth.
★ Integral power supply.

● BS620 is supplied with noise tube BS386, but calibrated to an accuracy of ± 1dB.

EEV Noise Tubes and Mounts

Frequency range (MHz)	Mount type	Tube type	Excess noise ratio (dB)	Waveguide size 153 IEC–	Operating current (mA)	Typical voltage (V)	Power supply type
1200–1400	**BS684**	BS344	15.0	R14	200	120	BS650
2600–4000	**BS632**	BS340	15.2	R32	200	100	BS610C, BS650
5200–5800	**BS628**	BS340	15.4	R48	200	100	BS610C, BS650
5900–8200	**BS636**	BS340	15.5	R70	200	100	BS610C, BS650
7000–10000	**BS638**	BS342	15.6	R84	125	79	BS610B, BS650
8500–10000	**BS604**	BS384 (CV1881)	15.5	R100	180	55	BS610, BS650
8500–10000	**BS642**	BS342	15.7	R100	125	79	BS610B, BS650
12400–18000	**BS696**	BS342	15.7	R140	125	79	BS610B, BS650
33000–36000	**BS606**	BS386	16.4	R320	100	48	BS610A, BS650
33000–36000	**BS620●**	–	16.4	R320	100	48	BS610A, BS650

EEV Noise Generator Power Supplies

Type	Description
BS610 series	Solid state, current stabilized power supply units for use with EEV gas discharge noise tubes. An output current meter is incorporated and automatic filament pre-heat and starting circuits are built-in.
BS650	Power supply unit for use with EEV gas discharge noise tubes. The output current is stabilized over a wide adjustment range and may be monitored by a front panel meter. Automatic filament pre-heat and an advanced tube striker are built-in.
BS690	Power supply unit for use with the EEV range of solid state noise generators and similar devices. The stabilized output current is adjustable over a wide range with the front panel meter and a lockable ten turn potentiometer.
BS692	Power supply unit for use with the EEV range of solid state noise generators and similar devices. It can be used in either a continuous or switched mode, clocked by an internally generated signal or by an external trigger signal. The fast switching times and accurate timing facilities enable rapid inter-pulse noise measurements to be made on a radar system without modulating incoming signals. The slower speed ranges and longer pulses allow it to drive the noise source in conventional switch radiometer applications.

EEV Transmission Line Pressure Windows

Glass-to-metal resonant windows as used in duplexer tubes can be supplied for application where a gas pressure differential is to be maintained in a waveguide system, with a high degree of transparency to microwave signals.
The windows listed below may be sealed into a socket with soft solder or a conducting epoxy resin. Windows required to be soldered will be supplied ready tinned to customer requirements on request.
The maximum peak power transmission capability of the window is dependent on the waveguide pressure differential. The maximum capability specified below applies to operation in air at atmospheric pressure. It increases considerably at higher pressure differentials.

Resonant frequency (MHz)	Type	Bandwidth at v.s.w.r. 1.2:1 (MHz)	Peak power max. (kW)
1300	**BS50L**	60	500
2425	**BS50SA**	120	150
2790	**BS50SB**	50	50
2935	**BS50SC**	80	150
3000	**BS50SD**	120	150
3005	**BS50SE**	120	150
3085	**BS50SF**	80	150
3200	**BS50SG**	120	150
3285	**BS50SH**	80	150
3520	**BS50SJ**	80	150

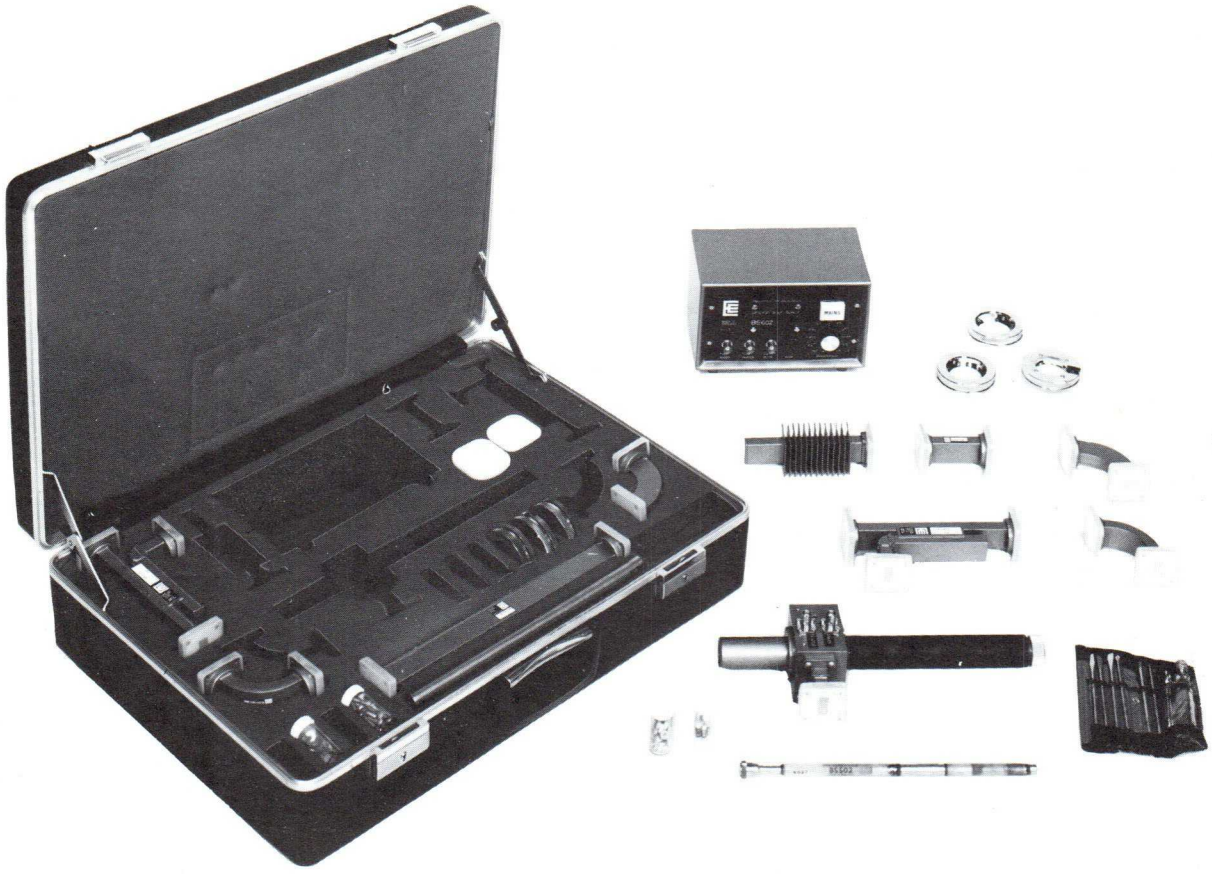
Resonant frequency (MHz)	Type	Bandwidth at v.s.w.r. 1.2:1 (MHz)	Peak power max. (kW)
5550	**BS50CA**	180	100
5700	**BS50CB**	180	100
8775	**BS50XA**	600	80
9025	**BS50XB**	600	80
9080	**BS50XC**	600	80
9240	**BS50XD**	600	80
9375	**BS50XE**	600	80
9410	**BS50XF**	600	80
9600	**BS50XG**	600	80
9750	**BS50XH**	600	80
9850	**BS50XJ**	600	80

EEV Monitor Diodes

Typical applications include the continuous monitoring of r.f. power, the direct viewing of r.f. power pulse envelopes and the detection of irregularities in magnetron or modulator performance.

Frequency range (MHz)	Type	Peak input power (max) (kW)	Mean input power (max) (W)	Pulse duration (max) (μs)	Diode load (Ω)	V.S.W.R. (max)	Mount
2500–6500	**BS510 (CV6107)**	20	18	15	68	1.5	BS514 BS516 BS524 BS534
5200–5500	**BS540**	20	18	15	68	1.3	BS538
8500–9000	**BS536**	20	20	15	47	1.3	BS528
8500–10000	**BS502 (CV6005)**	20	18	2.0	68	1.3	BS512 BS546

Note A monitor diode power supply type BS602 or power supply and indicator unit type BS600 is available for use with the above types.



Monitor Diode Kit BS614

EEV Monitor Diode Kit

Type	Description
BS614	The kit is intended for field tests of X-band radar transmitter performance. It is based on a monitor diode and permits measurement of peak output power, pulse parameters and irregularities in the transmitter performance. The kit includes a calibrated monitor diode and mount assembly, power supply, directional couplers and accessories to suit the users' requirements, all packed in a fitted carrying case. An oscilloscope and mains power source are the only additional facilities needed.

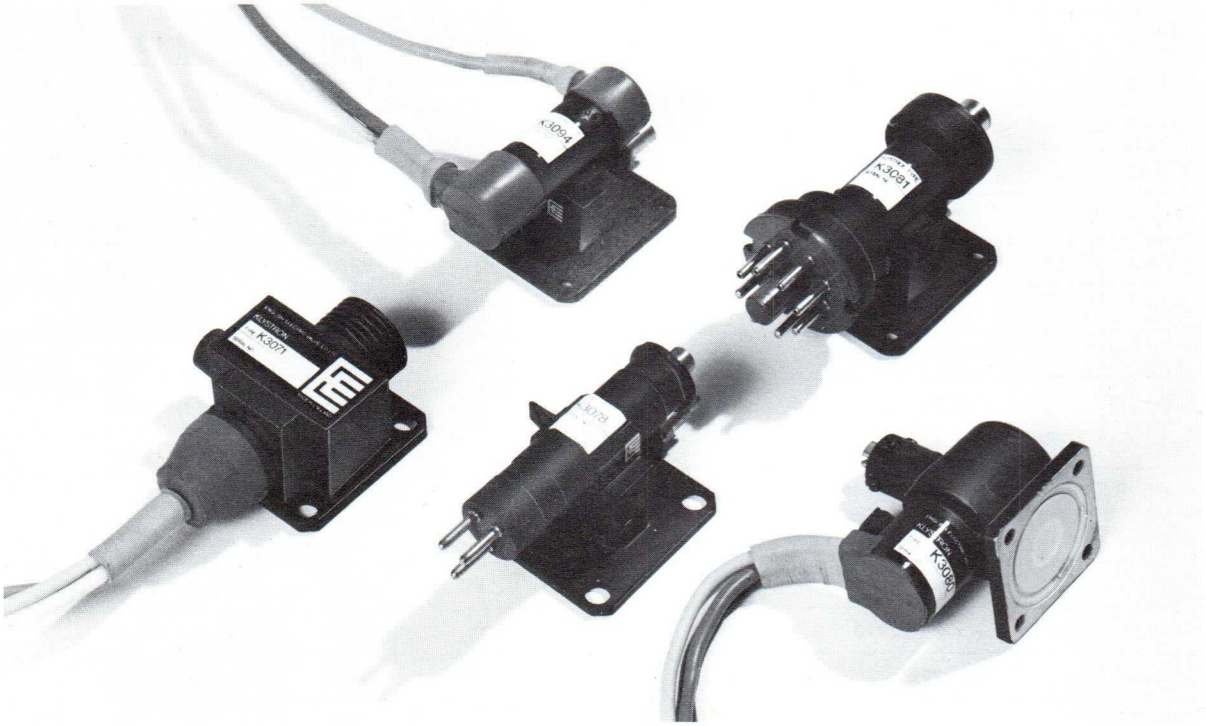
EEV Oscillator Klystrons

Mechanical tuning range (GHz)	Type	Output power (mW)	Electronic tuning range (MHz)	Beam voltage (V)	Base	Application
8.05–8.80	**K3079**§	90	35	300	Leads	Paramp pump
8.10–8.75	**K359 (CV5985)**§	90	55	350	Leads	Local oscillator
8.50–9.00	**K342 (CV6003)**§△	45	35	350	Tags	Local oscillator
8.80†	**K3071**‡	1500	15	740	Leads	Aircraft doppler
8.80†	**K3090**‡	1500	15	730	Leads	Aircraft doppler
8.80–8.885	**K391A (CV6142)**§	60	40	350	Leads	Local oscillator
8.80–8.885	**K3098**§	60	40	350	Leads	Local oscillator
8.74–9.26	**K3097**§	50	40	300	Leads	Local oscillator
8.50–9.50	**K311 (CV9492)**△	45	30	350	Octal	Local oscillator
8.50–9.60	**K3078/6975**§☆	35	37	300	B3A	Local oscillator
8.50–9.60	**K3111**§☆	35	37	300	Leads	Local oscillator
8.50–9.655	**K351 (CV2494)**§	90	45	300	Leads	Local oscillator
9.00–9.40	**K3118**	80	32	375	Leads	Local oscillator
9.16–9.34	**K391 (CV6194)**§	40	30	275	Leads	Local oscillator
9.295–9.395	**K3007 (CV9423)**§	40	35	350	Leads	Local oscillator
9.295–9.395	**K3094**§	40	35	350	Leads	Local oscillator
9.32–9.50	**K300**△	30	30	350	Octal	Local oscillator
9.32–9.50	**K302 (CV2164)**△	30	30	350	Octal	Local oscillator
9.35–9.55	**K3077**§	60	45	300	Octal	Low power doppler
9.35–9.55	**K3081**§	55	40	300	Octal	Local oscillator
9.35–9.55	**K3091**§	50	40	300	Leads	Local oscillator
9.00–10.00	**K324 (CV2304)**△	45	30	350	Octal	Local oscillator
9.00–10.00	**(CV5130) K337 (CV4515)**§△	45	24	350	Tags	Local oscillator
9.555–9.685	**K335 (CV2343)**△	25	30	350	Octal	Local oscillator
10.325–10.335	**K3073**	60	40	300	Leads	Low power doppler
10.525*	**K3069**	100	–	300	B3A	Low power doppler
10.50–10.55	**K3074**	27	20	300	Leads	Low power doppler
10.50–10.70	**K3076**§	60	30	300	Octal	Low power doppler
10.675–10.70	**K361B**△	27	20	300	Leads	Low power doppler
10.66–10.72	**K357**△	12	35	250	Octal	Low power doppler
10.66–10.72	**K3066**△	15	45	300	Octal	Low power doppler
10.70–10.725	**K361**△	27	20	300	Leads	Low power doppler
16.50–17.50	**K3080**§☆	65	70	330	Leads	Paramp pump

§ Rugged.
△ Maintenance type, not recommended for use in new equipment.
† Other frequencies available to special order.
‡ Two resonator type, fixed tuned.
☆ Reflector voltage precision tuned within ± 5V.
* Preset to this frequency.

EEV Oscillator Klystrons continued

Mechanical tuning range (GHz)	Type	Output power (mW)	Electronic tuning range (MHz)	Beam voltage (V)	Base	Application
33.5–36.0†	**K3038■**	350	50	2500	Leads	Instrumentation
33.5–36.0†	**K3039■**	75	50	2000	Leads	Local oscillator
34.1–35.6	**K3035■**	75	60	2000	BA7P	Local oscillator



A group of Oscillator Klystrons

EEV Floating Drift Tube Klystrons

Designs for Floating Drift Tube Klystrons cover mechanical tuning ranges centred around 23GHz and 35GHz and provide output powers of 10 to 20W. Customers' enquiries for tubes to suit particular applications are invited. These tubes are made to special order only.

EEV Amplifier Klystrons — CW Operation for Tropospheric Scatter Service

Output power (kW)	Type	Mechanical tuning range (MHz)	Narrow Band Operation			Cooling (see foot of next page)	Circuit assembly
			Drive power (W)	Beam voltage (kV)	Beam current (A)		
2.3	**3KM3000LA**	375–585	2.0	9.0	0.6	1	–
2.8	**3K3000LQ**	610–985	10	9.0	0.6	1	–
10	**3K50,000LF**	570–720	17	16	1.7	1,2	–
10.5	**4KM50,000LQ**	610–985	0.05	17	1.7	1,2	–
11.5‡	**K386**	755–985	0.5	12	2.7	1,3	K4148
12	**4KM50,000LR**	755–985	0.05	17	1.8	1,2	–

Note Beam perveance of K386 is 2×10^{-6}; perveance of other types listed above is 1×10^{-6}.

■ Made to special order only.
† Other frequencies available to special order.

EEV Amplifier Klystrons — CW Operation for Television Service

Output power⊕ (kW)	Type	Mechanical tuning range (MHz)	Typical Operation: Drive power‡ (W)	Drive power▲ (W)	Beam voltage (kV)	Beam current (A)	Cooling (see foot of page)	Circuit assembly
6.0	**K383**	470–610	1.0	–	9.5	1.9	1	K4140
6.0	**K384**	590–720	1.0	–	9.5	1.9	1	K4141
6.0	**K385**	700–860	1.0	–	9.5	1.9	1	K4142
7.5	**K3004**	470–610	1.0	–	10.5	2.2	1,3	K4145
7.5	**K3005**	590–720	1.0	–	10.5	2.2	1,3	K4146
7.5	**K3006**	700–860	1.0	–	10.5	2.2	1,3	K4147
11♦	**K365***	400–610	5.0	–	17.0	1.8	1,2	K4019A
11.5	**K370**	470–606	1.0	–	12.5	2.8	1,3	K4145
11.5	**K371**	606–742	1.0	–	12.5	2.8	1,3	K4146
11.5	**K372**	742–854	1.0	–	12.5	2.8	1,3	K4147
28.0	**K376**□	470–610	2.0	–	18.0	4.8	1,2	K4163
28.0	**K377**¶	590–720	2.0	–	17.5	4.5	1,2	K4164
28.0 45.0	**K3282**	470–610	0.9 0.9	– –	18.5 22.0	5.0 6.5	1,2,3	K4170
28.0 45.0	**K3283**	590–720	1.1 0.9	– –	18.5 22.0	5.0 6.5	1,2,3	K4171
28.0 45.0	**K3284**	700–860	1.1 0.9	– –	18.5 22.0	5.0 6.5	1,2,3	K4172
47.0	**K3217**	470–610	4.0	1.5	21.5	6.3	1,2,3	K4170
47.0	**K3218**	590–720	1.5	1.2	21.5	6.3	1,2,3	K4171
46.0	**K3219**	700–860	1.2	1.0	21.5	6.3	1,2,3	K4172
55.0	**K3382**	470–566	10	–	21.0	6.1	1,2,3	K4166
55.0	**K3383**	566–698	10	–	21.0	6.1	1,2,3	K4167
55.0	**K3384**	694–890	10	–	21.0	6.1	1,2,3	K4168

Note Beam perveance of K365 is 1×10^{-6}; perveance of other types listed above is 2×10^{-6}.

EEV Amplifier Klystrons — Pulse Operation

Output power (peak) (kW)	Type	Mechanical tuning range (MHz)	Gain (dB)	Pulse duration (μs)	Pulse repetition rate (p.p.s.)	Beam voltage (peak) (A)	Beam current (peak) (A)	Cooling (see foot of page)	Focus
11.5	**K3099**◇	960–1215	26 min	3.5	7200	12.5	4.2	1	Space charge
600	**K347A**	580–615	33	6.0	400	75	20	1	Electro-magnet
7000	**K211**■	2998 ± 5 Fixed	32	2.5	600	197	93	1,2	Integral
8000	**K390**■	2998 ± 5 Fixed	42	2.5	500	196	96	1,2	K4001

Power Klystron Cooling
1 Forced-air cooled.
2 Water cooled.
3 Vapour cooled.

⊕ At klystron output flange.
♦ Bandwidth 6MHz.
▲ Bandwidth 7MHz.
‡ Bandwidth 8MHz.
◇ Equivalent to SAL89.

* Near equivalent of 4KM50,000LA3.
□ Near equivalent of 4KM100LA.
¶ Near equivalent of 4KM100LF.
■ Made to special order only.

EEV CW Magnetrons

Fixed frequency types, operating in electro-magnet and launching section M4122.

Typical output power (kW)	Type	Frequency range (MHz)	Typical operation: Anode voltage (kV)	Anode current (A)	Load V.S.W.R. max	Class (see footnotes)
25◇	BM25LB● BM25LD● BM25LF●	896 ± 10□	12.5	2.4	2.5:1	EWAZ
25◇	BM25LC¶ BM25LE¶ BM25LG¶	915 ± 10‡	12.5	2.4	2.5:1	EWAZ

EEV Pulse Magnetrons — L-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	Class (see footnotes)
1300	M5086■ M5087■	1250–1310† 1305–1365†	36	90	4.0	0.0012	SAG
2300	M5084■ M5085■	1250–1310† 1305–1365†	39	150	5.0	0.0015	SWAG
2300	M5051 M5052	1250–1310† 1305–1365†	39	150	5.0	0.0015	SVAG
2600	M554▲ M586▲	1295–1365 1260–1300	39	150	5.0	0.00125	SWX
5000	M565■	1215–1365	48	240	10	0.0025	EWAZ

M-OV Pulse Magnetrons — S-Band

Fixed frequency types

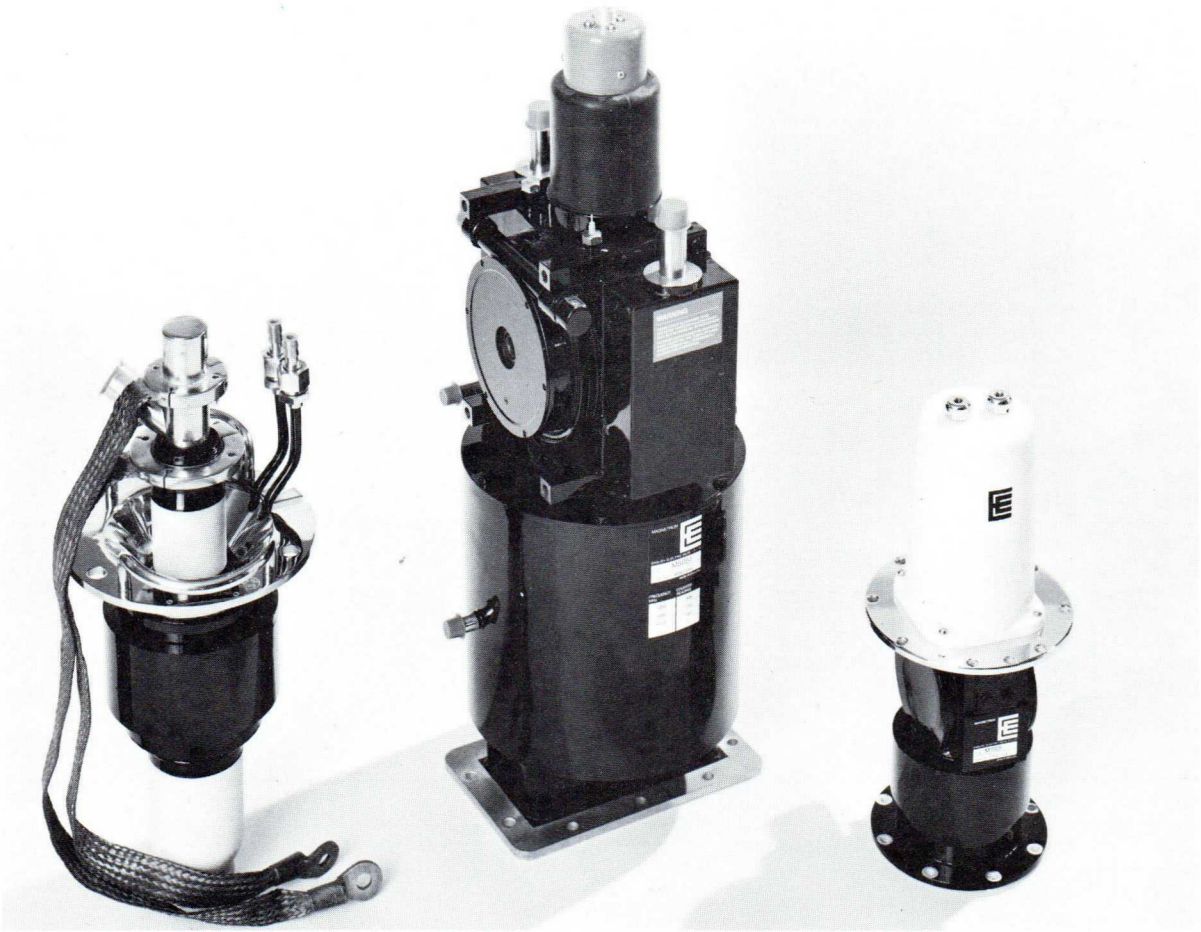
Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	Class (see footnotes)
425	CV1483△ CV1484△ CV1485△ CV1486△	3570–3614 3530–3570 3490–3530 3450–3490	27	40	0.5	0.00025	SAX
450	CV1475△ CV1476△ CV1477△ CV1478△	3340–3380 3305–3340 3270–3305 3230–3270	26	40	0.5	0.00025	SAX
450	CV1479△ CV1480△ CV1481△ CV1482△	3030–3060 3005–3030 2980–3005 2950–2980	27	35	2.0	0.001	SAX

◇ 30kW under matched load conditions.
■ Made to special order only.
● Identical apart from external fittings.
▲ Circular to rectangular waveguide transition section M4016 available.
△ Maintenance type, not recommended for use in new equipment.
□ For U.K.
‡ For U.S.A.
¶ Identical apart from external fittings.
† Mechanically tuned over the specified frequency range.
★ Water cooled electro-magnet and launching section assembly M4121 available.

EEV Pulse Magnetrons for Particle Accelerators

All types tunable over their specified frequency ranges.

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Typical operation: Peak anode current (A)	Typical operation: Pulse duration (μs)	Typical operation: Duty cycle	Class (see footnotes)
2000	**M5125**	2992–3001	43	100	4.0	0.001	SWX
5000	**M5028★**	2851–2861	51	240	2.3	0.0006	EWAZ



Magnetrons BM25L, M5051, M5125

EEV Pulse Magnetrons — S-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Typical operation: Peak anode current (A)	Typical operation: Pulse duration (μs)	Typical operation: Duty cycle	Class (see footnotes)
25	**2J70A**	3025–3075	7.0	8.0	1.0	0.001	PANC
25	**M5020**	3040–3060	8.0	8.0	0.07	0.00028	PANG
50	**M5063/2J70B**	3025–3075	9.0	15	0.3	0.0006	PANC
80	**M561**	3040–3060	13	15	1.0	0.001	SAC

CLASS

Magnetic Field

- E Electro-magnet
- P Packaged integral magnet
- S Separate magnet

Cooling

- A Forced-air
- B Conduction
- N Natural
- W Water
- V Vapour

Output

- C Coaxial
- G Waveguide
- X Requires transition section
- Z Requires electro-magnet with launching section

EEV Pulse Magnetrons — S-Band continued

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	Class (see footnotes)
750	**M5094**	2700–2900†	30	64	1.5	0.0006	SAC
900	**4J43**	2992–3019					
900	**4J44**	2965–2992	28	70	1.0	0.0005	SAC
900	**M577B (CV10210)**	3000–3040					
900	**M578B**	3060–3100	28	70	1.0	0.0005	SAC
900	**M5079A**	3100–3300†					
900	**M5126A**	3100–3300†☆	32	70	1.0	0.0005	SAC
1000	**4J31 (CV1914)**	2860–2900					
1000	**4J32**	2820–2860					
1000	**4J33 (CV1916)**	2780–2820					
1000	**4J34 (CV1897)**	2740–2780					
1000	**4J35 (CV1898)**	2700–2740					
1000	**4J53 (CV513)**■	2793–2813					
1000	**CV2744**	2740–2765					
1000	**M595B (CV8905)**	2860–2900	28	70	1.0	0.0005	SAC
1000	**5586 (CV3611)**	2700–2900†					
1000	**5657 (CV3958)**	2900–3100†					
1000	**M5035 (CV11154)**	2900–3100†					
1000	**M5083A**	2700–2900†☆					
1000	**M5091A**	2900–3100†☆					
1000	**M5113**	2900–3100†					
1000	**M5114B**	2700–2900†	30	70	1.0	0.0005	SAC
1000	**M5030A**	2900–3050†					
1000	**M5034A**	3050–3200†	31.5	70	2.0	0.002	PAG
1150	**M525 (CV2362)**	2750–2765					
1150	**M525 (CV2363)**	2765–2780					
1150	**M525 (CV2364)**	2780–2795					
1150	**M525 (CV2365)**	2795–2810					
1150	**M525 (CV2366)**	2810–2825					
1150	**M525 (CV2367)**	2825–2840					
1150	**M525 (CV2368)**	2840–2855	36	70	1.0	0.001	SWG
1200	**M5048**	2900–3000†	33	70	5.0	0.0015	PVAG
1250	**BM1006 (CV2319)**	2980–3020	35	70	5.0	0.0015	SWX
2000	**BM1003**■	3034–3052					
2000	**BM1004**■	2989–3007					
2000	**BM1005**■	2944–2962	43	90	2.0	0.001	SWX
2500	**7182**△	2750–2860	35	157	5.0	0.0015	EWAZ
2500	**M566**‡	2750–2860					
2500	**M5133**‡⊕	2750–2860	38.5	145	5.0	0.0015	EWAZ
2500	**M569**‡	2850–2960					
2500	**M5134**‡⊕	2850–2960	40	140	5.0	0.0015	EWAZ
2500	**M570**‡	2950–3060					
2500	**M5135**‡⊕	2950–3060	40	140	5.0	0.0015	EWAZ
2500	**M573**△	2850–2960	38	144	5.0	0.0015	EWAZ
2500	**M574**△	2950–3060	41	132	5.0	0.0015	EWAZ
2500	**M579 (CV8002)**‡	3050–3160					
2500	**M5136**‡⊕	3050–3160	38.5	145	5.0	0.0015	EWAZ

△ Maintenance type, not recommended for use in new equipment.

* Required frequency to be specified.

§ Rugged.

ϕ Quick heat cathode.

☆ Improved tuner mechanism.

⊕ Encapsulated to reduce stray radiation.

† Mechanically tuned over the specified frequency range.

■ Made to special order only.

◇ Low thermal coefficient of frequency.

‡ Water-cooled electro-magnet assembly M4011, including launching section M4017, available.

EEV Pulse Magnetrons — C-Band

Fixed frequency types

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	Class (see footnotes)
840	**M5032** **M5033**	5250–5350 5430–5530	34	60	5.0	0.0015	EWAZ

Magnetrons MAG17 and MAG22

M-OV Pulse Magnetrons — X-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	Class (see footnotes)
0.05	**MAG22***	8790–8830	0.8	0.15	4.0	0.4	PAG
0.3	**MAG17*§φ**	9000–11000	0.85	1.5	0.35	0.0014	PBC
0.3	**MAG20■*†§φ**	9000–11000	0.85	1.5	0.35	0.0014	PBC
1.5	**MAG23A◇§φ** **MAG23B◇§φ** **MAG23C◇§φ** **MAG23D◇§φ**	9620–9675 9675–9750 9750–9825 9825–9880	2.25	3.0	0.25	0.001	PBG
2.0	**MAG12■*§φ**	9000–11000	2.25	3.0	0.25	0.001	PBG
8.0	**MAG15*§φ**	9000–11000	5.80	5.0	0.12	0.0015	PBG
130	**MAG21A§** **MAG21B§** **MAG21C§**	9500–9590 9555–9645 9610–9700	17	20	0.25	0.001	PAG

CLASS

Magnetic Field

E	Electro-magnet
P	Packaged integral magnet
S	Separate magnet

Cooling

A	Forced-air
B	Conduction
N	Natural
W	Water
V	Vapour

Output

C	Coaxial
G	Waveguide
X	Requires transition section
Z	Requires electro-magnet with launching section

EEV Pulse Magnetrons — X-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	Class (see footnotes)
1.4	**M5021**	9380–9440	2.0	2.25	0.1	0.00015	PNG
4.0	**M5064H**	9345–9405	3.6	3.0	0.1	0.0002	PNG
4.0	**M599A** **M599B (CV10758)**	9415–9475	3.6	3.0	0.1	0.0002	PNG
5.0	**M5115**	9380–9440	4.9	4.0	1.0	0.002	PANG
6.0	**M5065**	9345–9405	4.6	4.5	1.0	0.002	PANG
6.75	**M5097**	9200–9600□	4.35	5.0	0.8	0.0008	PNG
7.5	**M5043** **M5044**	9380–9440 9415–9475	4.35	5.0	0.8	0.0008	PNG
8.0	**M5019**	9345–9405	5.4	4.5	0.25	0.00037	PANG
8.3	**2J42 (CV3676)**	9345–9405	5.5	4.5	1.0	0.002	PANG
8.3	**2J42H**	9345–9405	5.5	4.5	0.45	0.00036	PANG
9.0	**M537A (CV6108)**	8770–8830	5.5	4.5	1.0	0.001	PAG
9.0	**M5067**	9345–9405	5.5	4.5	1.0	0.002	PANG
9.0	**M5067H**	9345–9405	5.5	4.5	2.5	0.001	PANG
9.0	**M5117 series**	9400–9720†	5.6	5.0	0.5	0.0005	PANG
9.5	**M503A**	9345–9405	5.6	4.5	0.5	0.0005	PANG
9.5	**M5108**	9380–9440	5.8	5.0	1.0	0.002	PANG
10.5	**M597**	9380–9440	5.7	5.0	0.5	0.0005	PANG
10.5	**M5031**	9345–9405	5.7	5.0	0.5	0.00062	PANG
20	**6027 (CV5135)**	9345–9405	6.9	7.0	1.0	0.001	PAG
20	**6027H**	9345–9405	7.2	7.5	2.5	0.001	PAG
20	**8356 (CV8505)**	9345–9405	7.2	7.5	2.5	0.001	PANG
20 20 20	**M5023** **M5024** **M5025**	9345–9405 9415–9475 9380–9440	7.8	7.5	0.5	0.0005	PANG
21	**BM1002**	9415–9475	7.8	8.0	0.1	0.0002	PAG
22	**M513A (CV3528)**	9345–9405	7.6	7.5	1.0	0.0005	PANG
22	**M513B (CV3997)**	9345–9405	7.6	7.5	1.0	0.0005	PANG
22	**M540B**	9345–9405	7.6	7.5	1.0	0.0005	PANG
22	**M598B**	9380–9440	7.6	7.5	1.0	0.0005	PANG
25	**M515**	9380–9440	8.2	8.0	1.0	0.0005	PANG
25	**M5039**	9345–9405	8.2	8.0	1.0	0.0005	PANG
25	**M5068**	9620–9680	8.2	8.0	1.0	0.0005	PANG
25	**M5111**	9350–9400	8.2	8.0	1.0	0.0005	PANG
30	**M5022**	9415–9475	8.3	9.0	1.0	0.0005	PANG
30	**M5089**	9415–9460	8.3	9.0	1.0	0.0005	PANG

† Mechanically tuned over the specified frequency range.

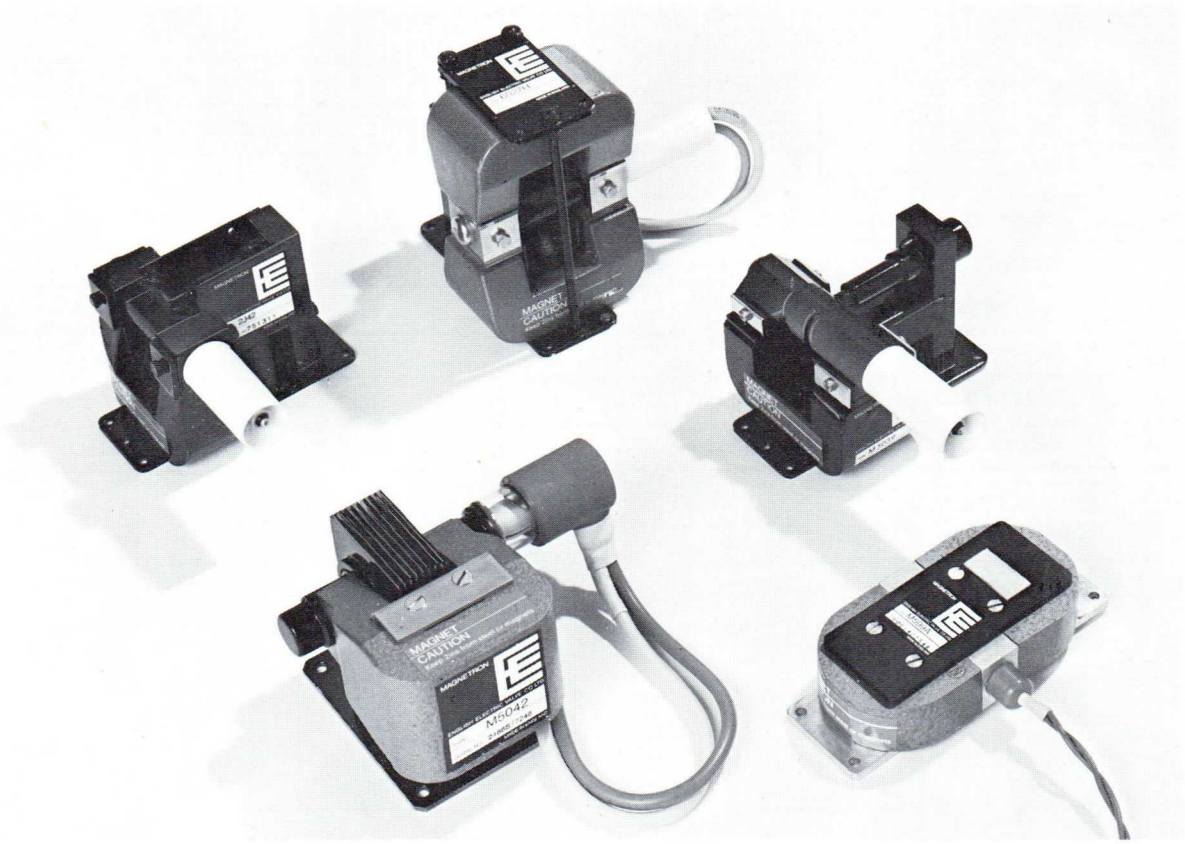
□ Preset tuning.

EEV Pulse Magnetrons — X-Band continued

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	Class (see footnotes)
30	**M5105**	9455–9495	8.3	9.0	1.0	0.0005	PANG
40	**BM1031 (CV2186)**	9420–9500	13	10	1.0	0.001	SAG
45	**M505 (CV1747)**	9360–9460	11.1	12	1.0	0.001	SAG
45	**M521 (CV2376)**	9600–9700	11.1	12	1.0	0.001	SAG
50	**2J55**	9345–9405	12.5	12	1.0	0.001	PAG
50	**M506A (CV3982)**	9360–9460	11.5	12	1.0	0.001	SAG
50	**M5061**	9300–9340					
50	**M5062**	9440–9480	11.5	12	1.0	0.001	SAG
50	**M5075**	9005–9035					
50	**M5076**	9135–9165					
50	**M5077**	9165–9195	11.5	12	1.0	0.001	SAG
50	**M5142**	9385–9435	12.5	12	1.0	0.001	PAG
	M5005 (CV9424)						
53	**M5005A**	9345–9405	13	12	4.0	0.0016	PAG
60	**BM1026**	9505–9540					
60	**BM1027**	9540–9580					
60	**BM1028**	9580–9620					
60	**BM1029**	9620–9660					
60	**BM1030**	9660–9695	14	11	0.5	0.001	SAG

A group of X-Band Magnetrons



CLASS

Magnetic Field

- E Electro-magnet
- P Packaged integral magnet
- S Separate magnet

Cooling

- A Forced-air
- B Conduction
- N Natural
- W Water
- V Vapour

Output

- C Coaxial
- G Waveguide
- X Requires transition section
- Z Requires electro-magnet with launching section

EEV Pulse Magnetrons — X-Band continued

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation: Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	Class (see footnotes)
60	**BM1038 (CV2261)■**	9050–9600†					
60	**BM1039 (CV2262)■**	8500–9050†	14	15	0.1	0.0003	PAG
65	**M581**	9415–9475	14	14	0.5	0.0006	PAG
70	**BM1032**	9440–9510†					
70	**BM1033**	9800–9860†					
70	**BM1034**	9620–9680†					
70	**BM1035**	9520–9580†					
70	**BM1036**	9245–9305†					
70	**BM1037**	9145–9205†	17	12	0.5	0.00091	SAG
70	**M5101**	8500–9600□	15	15	0.5	0.001	PNG
70	**M5119**	8500–9600	15	15	0.5	0.001	PNG
75	**BM1040 (CV5167)**	9040–9120†	15	11	0.5	0.00072	SAG
75	**M5109☆**	9345–9405	13	12	5.0	0.001	PBAG
75	**M5138☆**	9325–9365	13	12	5.0	0.001	PBAG
80	**4J52A (CV5018)**	9350–9400	15.5	15	1.0	0.001	PAG
80	**M575**	9345–9405	15	15	1.0	0.001	PAG
80	**M592**	8925–8995	15.5	15	1.0	0.001	PAG
80	**M596**	9370–9430	14.8	15	1.0	0.001	PAG
80	**M5080**	9210–9270					
80	**M5081**	9345–9405	15.5	15	1.5	0.0012	PAG
85	**M5118**	9315–9375	15	15	0.2	0.0004	PAG
100	**M5042S**	9315–9375	15	17.5	5.0	0.001	PAG
135	**M5041**	9345–9405	20	16	1.0	0.001	PAG
225	**4J50A (CV2284)**	9345–9405	22	25	1.0	0.001	PAG
225	**M523 (CV2412)**	9580–9705	22	25	1.0	0.001	PAG
225	**M529 (CV2426)**	8830–8995	22	25	1.0	0.001	PAG
225	**M538A (CV2473)**	9210–9270	22	25	1.0	0.001	PAG
225	**M539 (CV2425)**	8665–8830	22	25	1.0	0.001	PAG
225	**M549 (CV2424)**	8500–8665	22	25	1.0	0.001	PAG
750	**M504■**	9325–9425	35	50	0.6	0.0006	EAG

M-OV Pulse Magnetron — J-Band

Fixed frequency type

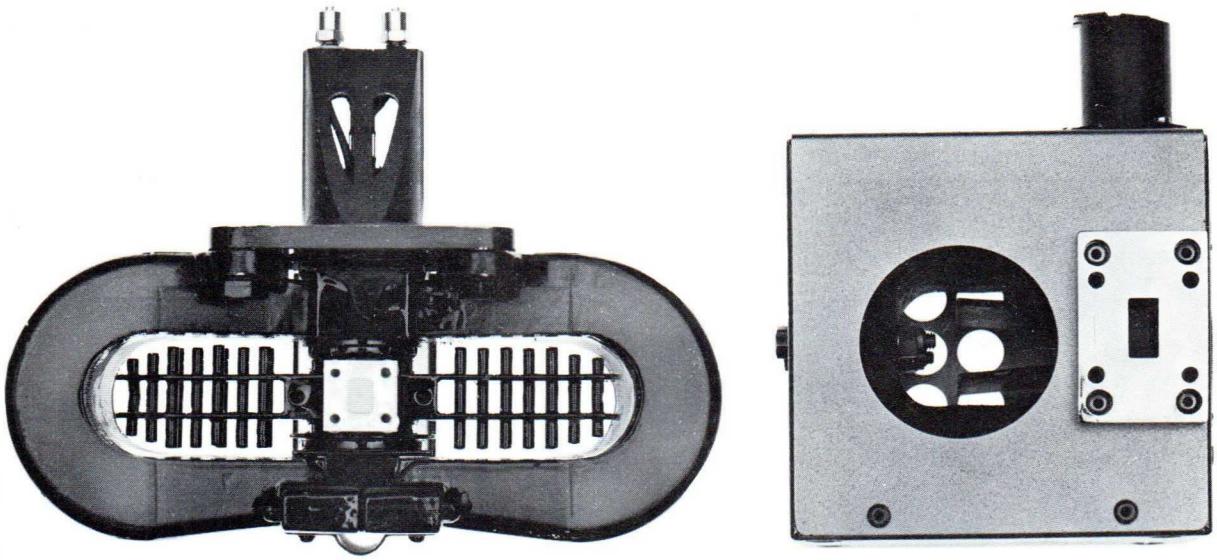
Peak output power (kW)	Type	Frequency range (GHz)	Typical operation: Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	Class (see footnotes)
35	**MAG19ϕ**	16.36–16.64	11	11	0.5	0.001	PANG

■ Made to special order only.
ϕ Quick heat cathode.
□ Preset tuning.
☆ Coaxial magnetron.
♦ Frequency agile.
† Mechanically tuned over the specified frequency range.

EEV Pulse Magnetrons — Q-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Centre frequency range (GHz)	Typical operation: Tuning range (MHz)	Typical operation: Peak anode voltage (kV)	Typical operation: Peak anode current (A)	Typical operation: Pulse duration (ns)	Typical operation: Duty cycle	Class (see footnotes)
18	**M5055**	34.4–35.4	–	12	9.0	30	0.00045	PAG
20	**M5123**	34.7–35.2	500†	12	9.0	30	0.00045	PAG
20	**M5127**	35.0	200†	12	8.5	120	0.0018	PAG
45	**M5060**	34.7–35.2	500†	14	15	100	0.0004	PAG
50	**M5053**	34.3–35.3	–	14	15	100	0.0004	PAG
50	**M5054**	34.3–35.3	–	14	15	100	0.0004	PAG
50	**M5059**	34.5–38.0	320◆	14.5	15.5	200	0.0004	PAG
50	**M5100**	33.0–36.0	–	13.5	15.5	100	0.0004	PAG



Pulse Magnetrons M5059 and MAG19

EEV Pulse Magnetrons — O-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Centre frequency range (GHz)	Typical operation: Tuning range (MHz)	Typical operation: Peak anode voltage (kV)	Typical operation: Peak anode current (A)	Typical operation: Pulse duration (ns)	Typical operation: Duty cycle	Class (see footnotes)
4.0	**M5137**	79.0–81.0	1000†	12	5.0	50	0.0002	PAG
5.0	**M5124**	80.5–81.5	600◆	12	5.0	50	0.0002	PAG
6.0	**M5057**	78.0–82.0	–	11	5.0	50	0.0002	PAG

CLASS

Magnetic Field

- E Electro-magnet
- P Packaged integral magnet
- S Separate magnet

Cooling

- A Forced-air
- B Conduction
- N Natural
- W Water
- V Vapour

Output

- C Coaxial
- G Waveguide
- X Requires transition section
- Z Requires electro-magnet with launching section

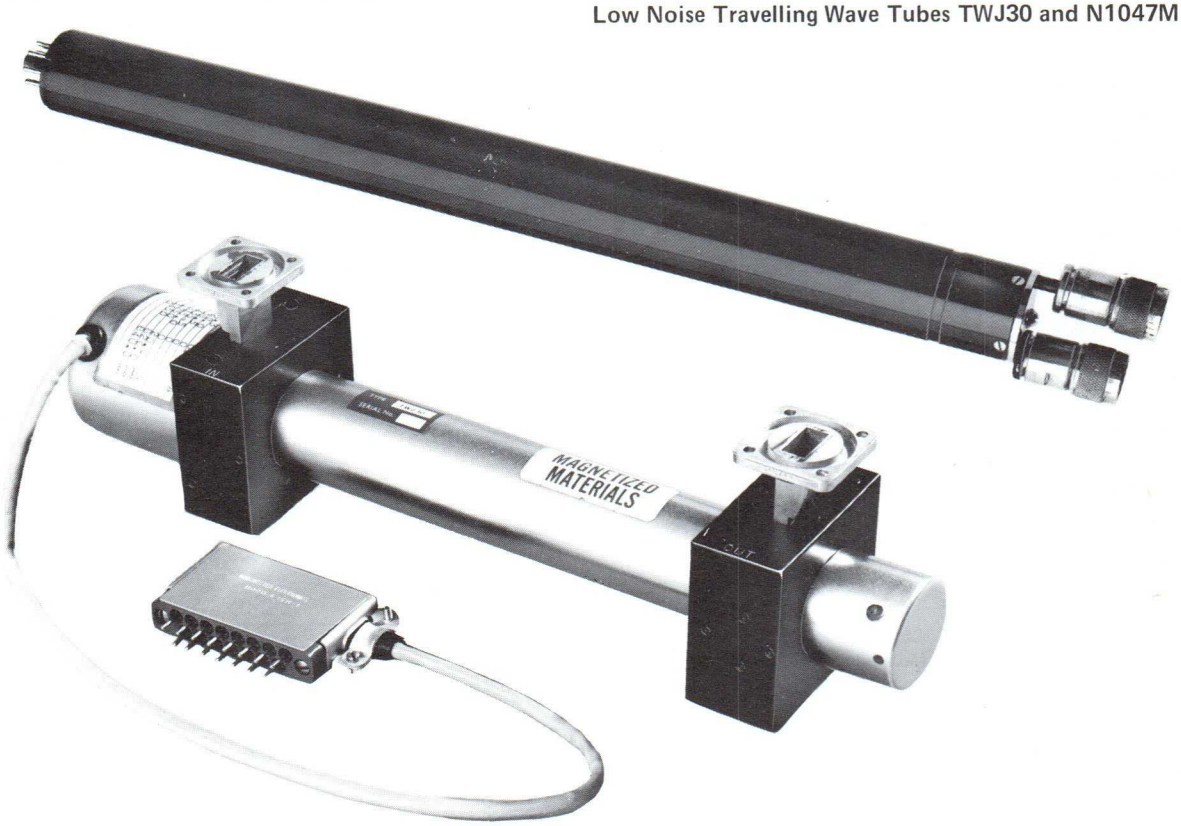
M-OV Travelling Wave Tubes — Low Noise

Frequency range (GHz)	Type	Saturated output power (mW)	Noise factor (dB)	Low level gain (dB)¶	Collector		R.F. connectors	Focus system
					Voltage (kV)	Current (mA)		
2.0–4.1	TWS17§	20	11	38.5	0.7	0.8	Coaxial	PPM
4.0–8.0	TWC18§	20	11	38.5	1.05	1.0	Coaxial	PPM
7.0–12.0	TWX19§	10	11	37	1.5	1.0	Coaxial	PPM
12.0–18.5	TWJ30§	3.0	13.5	35	1.5	0.6	Waveguide	PPM

EEV Travelling Wave Tubes — Low Noise

Frequency range (GHz)	Type	Saturated output power (mW)	Noise factor (dB)	Low level gain (dB)	Collector		R.F. connectors	Focus system
					Voltage (V)	Current (μA)		
1.2–1.4	N1017M (CV6106)■	2.0	6.5	26	450	150	Coaxial	N4003⊕■
2.7–3.2	N1047M (CV8908)	1.5	4.0	24	800	130	Coaxial	N4041⊕■
2.7–3.5	6861 (CV5362)	1.0	6.5	25	400	150	Coaxial	N4004⊕■
2.7–3.5	N1042M (CV8131)	1.0	6.5	25	400	150	Coaxial	N4004⊕■
2.5–4.1	N1045M (CV5386)	3.0	8.0	28	400	225	Coaxial	N4004⊕■
4.1–7.0	N1016M (CV6098)■	3.5	9.5	37	720	350	Coaxial	N4001⊕■

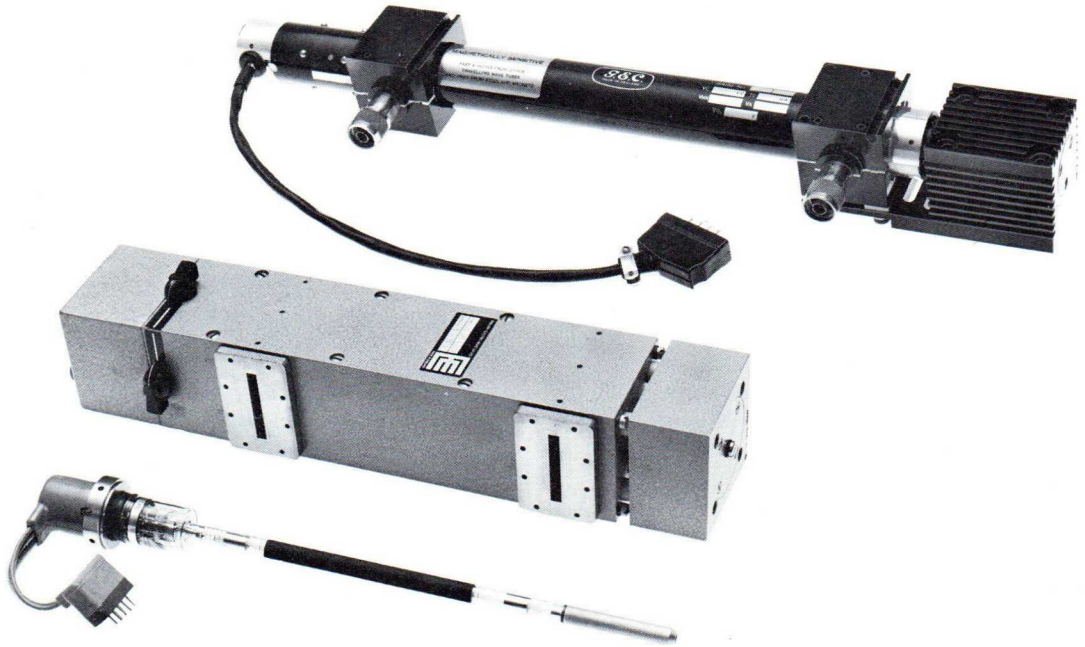
Low Noise Travelling Wave Tubes TWJ30 and N1047M



§ Rugged.
☆ Convection cooled version available.
★ Conduction cooled periodic permanent magnet.
† High efficiency design to minimize power consumption.
△ Maintenance type, not recommended for use in new equipment.
⊕ Solenoid.
■ Made to special order only.
¶ Gain at 3dB below saturation output power level.
□ Conduction cooled periodic permanent magnet. Covers part of frequency range given.

EEV Travelling Wave Tubes — S-Band

Frequency range (GHz)	Type	Saturated output power (W)	Noise factor (dB)	Low level gain (dB)¶	Collector Voltage (kV)	Collector Current (mA)	R.F. connectors	Focus system
3.55–4.2	**N1073Z†**	18	23	40	1.7	45	Waveguide	N4136★☆
3.55–4.2	**N10004†**	35	23	41	2.4	60	Waveguide	N4136★☆
3.55–4.2	**N10010†**	12	23	37	1.7	30	Waveguide	N4174★☆
3.6–4.2	**N1086†**	17	24	39	1.3	40	Coaxial	Integral★
3.55–5.0	**N1073†**	16	23	41	1.7	45	Waveguide	N4136★☆
3.55–5.0	**N10002†**	16	23	41	1.7	45	Waveguide	Integral★☆
3.8–4.8	**N1033 (CV5403)△**	7.0	28	37	1.4	24	Waveguide	N4006⊕■
3.6–5.0	**N1056△**	17	27	38	2.0	45	Waveguide	N4074□△■ N4075□△■



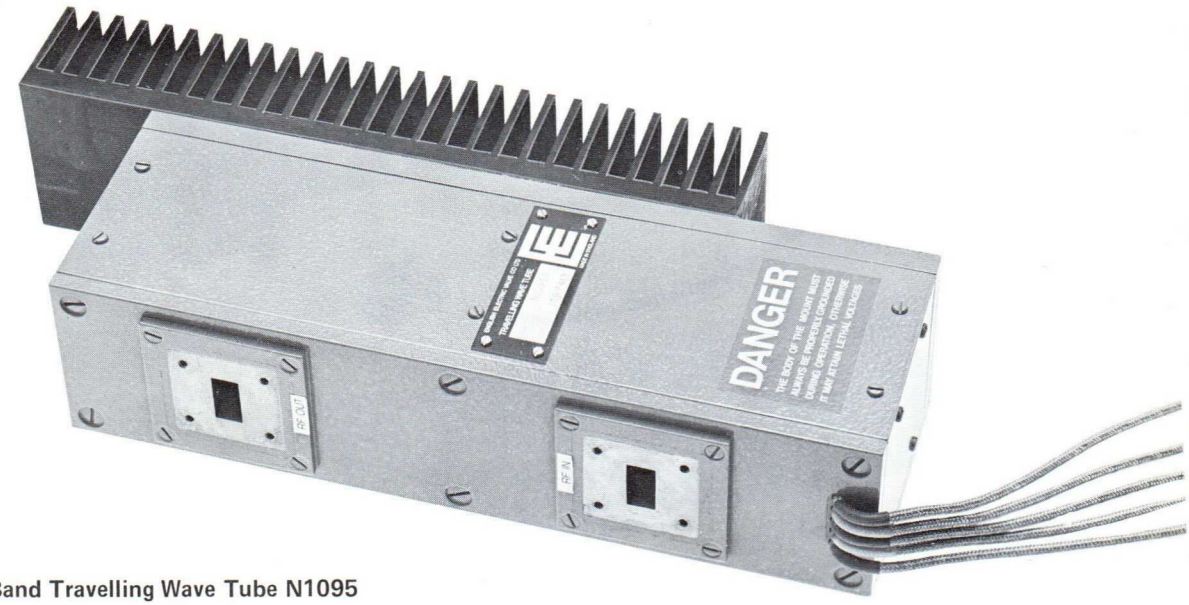
S-Band Travelling Wave Tube N1073 with Mount N4136, and TWS36

M-OV Travelling Wave Tubes — S-Band

Frequency range (GHz)	Type	Saturated output power (W)	Noise factor (dB)	Low level gain (dB)¶	Collector Voltage (kV)	Collector Current (mA)	R.F. connectors	Focus system
1.67–1.9	**TWS25■**	15	30	33	2.0	75	Coaxial	PPM★
1.7–2.3	**TWS10/7642**	18	28	30	2.3	73	Coaxial	PPM
1.7–2.3	**TWS36**	18	28	30	2.3	73	Coaxial	PPM★
1.7–2.7	**TWS12**	20	30	34	2.2	75	Coaxial	PPM
1.9–2.33	**TWS24■**	18	30	35	2.0	75	Coaxial	PPM
2.5–4.1	**(CV6085)△ TWS6 (CV6157)△**	1.0	21	20	2.4	15	Coaxial	SMS6⊕
2.7–3.25	**TWS7 (CV6117)△**	3.0	24	23	2.4	22	Coaxial	SMS7⊕

EEV Travelling Wave Tubes — C-Band

Frequency range (GHz)	Type	Saturated output power (W)	Noise factor (dB)	Low level gain (dB)¶	Collector		R.F. connectors	Focus system
					Voltage (kV)	Current (mA)		
5.925–6.425	**N1070■**	10	27	35	1.5	30	Waveguide	N4132▲■
5.9–6.45	**N10003†**	28	23	44	2.0	60	Waveguide	Integral★☆
5.8–7.2	**N1029△**	10	27	43	1.8	35	Waveguide	N4047★■
5.8–7.2	**N10009†**	12	23	37	1.7	34	Waveguide	N4135★☆
5.85–7.15	**N1055△**	18	27	43	2.0	45	Waveguide	N4085□△■ N4094□△■
5.8–7.2	**N1072†**	19	23	44	1.7	45	Waveguide	N4135★☆
5.8–7.2	**N10001†**	19	23	44	1.7	45	Waveguide	Integral★☆



X-Band Travelling Wave Tube N1095

M-OV Travelling Wave Tubes — C-Band

Frequency range (GHz)	Type	Saturated output power (W)	Noise factor (dB)	Low level gain (dB)¶	Collector		R.F. connectors	Focus system
					Voltage (kV)	Current (mA)		
5.925–6.425	**TWC5 (CV5438)**							
7.4–7.8	**TWC5A**							
6.9–7.4	**TWC5B**							
6.425–7.11	**TWC5C**	10	28	37	1.8	40	Waveguide	PMC5▲
5.925–6.425	**TWC14 (CV11039)**			36.5				
7.4–7.8	**TWC14A**			33				
6.9–7.4	**TWC14B**			33				
6.425–7.11	**TWC14C**	18	27	36.5	1.8	45	Waveguide	PMC14▲
5.925–6.425	**TWC35†**			38				
7.4–7.8	**TWC35A■†**			35				
6.9–7.4	**TWC35B■†**			35				
6.425–7.11	**TWC35C■†**	15	25	38	1.3	35	Waveguide	PPM▲†
5.925–6.425	**TWC37†**			38				
7.4–7.8	**TWC37A■†**			35				
6.9–7.4	**TWC37B■†**			35				
6.425–7.11	**TWC37C■†**	15	25	38	1.3	35	Coaxial	PPM★☆†

▲ Convection cooled periodic permanent magnet.

† High efficiency design to minimize power consumption.

☆ Convection cooled version available.

■ Made to special order only.

★ Conduction cooled periodic permanent magnet.

¶ Gain at 3dB below saturation output power level.

§ Rugged.

⊕ Solenoid.

EEV Pulsed Travelling Wave Tubes — C-Band

Frequency range (GHz)	Type	Peak output power (W)	Duty cycle	Gain (dB)	Collector Voltage (kV)	Collector Current (mA)	R.F. connectors	Net weight (kg)
4.4–5.8	**N10007**	140	0.1♦	40	3.3	200	SMA	0.9
4.4–5.8	**N1094**	250	0.05♦	40	3.3	350	SMA	1.1

M-OV Travelling Wave Tubes — X-Band

Frequency range (GHz)	Type	Saturated output power (W)	Noise factor (dB)	Low level gain (dB)	Collector Voltage (kV)	Collector Current (mA)	R.F. connectors	Focus system
7.0–11.5	**TWX8**	0.5	30	35¶	2.7	8.0	Waveguide	PPM▲
7.0–11.5	**TWX22**§	0.5	30	35¶	2.6	8.0	Waveguide	PPM▲
7.0–11.5	**TWX34**§	0.5	30	35¶	2.6	8.0	Waveguide	PPM▲
8.0–9.3	**TWX16**	5.0–20kW (peak)	–	47–53	15–23	3–6A (peak)	Waveguide	SMX16⊕

EEV Travelling Wave Tubes — X-Band

Frequency range (GHz)	Type	Saturated output power (W)	Noise factor (dB)	Low level gain (dB)¶	Collector Voltage (kV)	Collector Current (mA)	R.F. connectors	Focus system
7.0–8.5	**N1038**△	10	27	40	1.8	35	Waveguide	N4051★■
7.0–8.5	**N1071**	16	24	44	2.0	45	Waveguide	N4134★☆
7.0–8.5	**N10000**	16	24	44	2.0	45	Waveguide	Integral★☆
10.7–13.25	**N1095**	16	25	40	1.7	40	Waveguide	Integral★☆
10.7–13.2	**N1093**	30	25	43	2.3	65	Waveguide	Integral★☆

EEV Travelling Wave Tube Power Supply

Type	Description
N4173	A high voltage solid state power supply designed specifically to provide the required voltages for the following tubes operating with collectors at ground potential:- N1071 N1073 N10000 N10002 N10009 N1072 N1095 N10001 N10005 N10010 The power supply has adequate built-in metering facilities, comprehensive over-voltage and over-current protection and provision for adjustment and control of output voltages. Two low voltage outputs of –24V d.c. are provided to supply power to the receiver and low level transmitter section of microwave relay equipments.

△ Maintenance type, not recommended for use in new equipment.

♦ High μ grid modulated.

□ Conduction cooled periodic permanent magnet. Covers part of frequency range given.

EEV Pulsed Travelling Wave Tube — X-Band

Frequency range (GHz)	Type	Peak output power (kW)	Duty cycle	Gain (dB)	Beam voltage (kV)	Beam current (A)	Solenoid
X-Band*	**N1061■**	900	0.005	33	100	31	N4115

EEV Travelling Wave Tubes — Broadband, Rugged

The range consists of tubes of rugged metal/ceramic construction, designed to meet severe environmental requirements and suitable for military communications, ECM systems etc. The tubes are integral with their periodic permanent magnet focusing mounts and are conduction cooled. Related tubes at other frequencies and power levels or in alternative physical designs, for use under pulse, c.w. or phase modulated conditions, are available and enquiries are invited.

EEV can supply complete travelling wave tube amplifier chains, including gain equalizers, where higher gain and efficiency than similar single tube systems is required.

Frequency range (GHz)	Type	Saturation output power (min) (W)	Gain at saturation (min) (dB)	Helix voltage (kV)	Collector		Output connections†	Weight (kg)
					Voltage (kV)	Current (mA)		
4.8–9.6	**N1083**	25	43	3.3	2.0	88	SMA	1.7
5.0–10	**N1078**	2.0	36	2.0	2.0	25	SMA	0.9
5.0–10	**N1077**	100	30	5.8	3.2	200	TNC	3.4
7.0–11	**N1079**	2.0	36	2.0	2.0	25	SMA	0.9
7.0–11	**N1080**	200	31	8.0	4.0	280	TNC	3.9
8.0–12	**N1075**	100	30	5.75	3.25	175	TNC	2.7
9.5–12.4	**N1065**	35	40	4.83	2.0	64	OSM224	2.6
8.0–16	**N1082**	1.0	36	2.0	2.0	20	SMA	0.7
9.0–16	**N1081**	100	30	7.1	4.2	180	Waveguide	2.8

M-OV Backward Wave Oscillators — M Type

Operating frequency range (GHz)	Type	Typical output power (W)	Tuning (line) voltage range (kV)	Tuning sensitivity (MHz/V)	Beam current (mA)	Sole voltage (V)	Sole voltage tuning range (MHz)
2.5–3.1	**BWS1**	400	2.5–4.8	0.31	350	−700	–
3.0–4.0	**BWS2**	250	2.2–4.7	0.46	350	−700	–
7.6–10.4	**BWX5**	200	2.5–5.1	1.0	350	−1800	500

EEV Backward Wave Oscillators — O Type

Frequency range (GHz)	Type	Typical output power (mW)☆	Delay line voltage range (V)	Delay line current max (mA)	Integral focusing	Coaxial output connections	Base
2.4–4.5	**N1034A (CV2381)** **N1034S (CV6023)**	90–400	150–1170	50	Magnet Solenoid	Type N	B7D
7.0–11.5	**N1010A (CV2393)** **N1010S (CV6024)**	40–130	300–1500	40	Magnet Solenoid	Type N	USM7

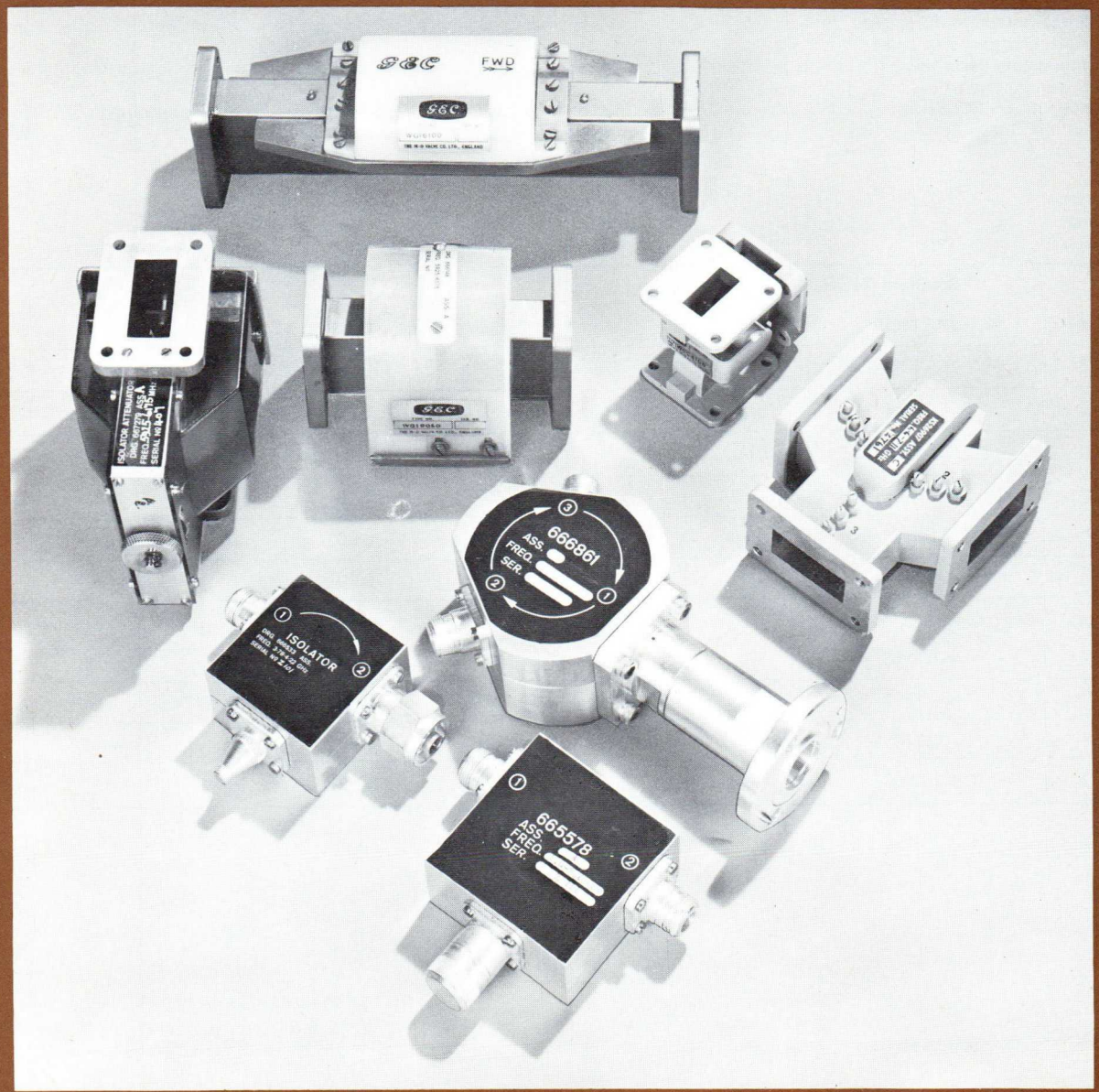
* Tubes covering 450MHz bands centred on various frequencies in X-band can be supplied.

■ Made to special order only.

☆ Variation of typical output power over the band.

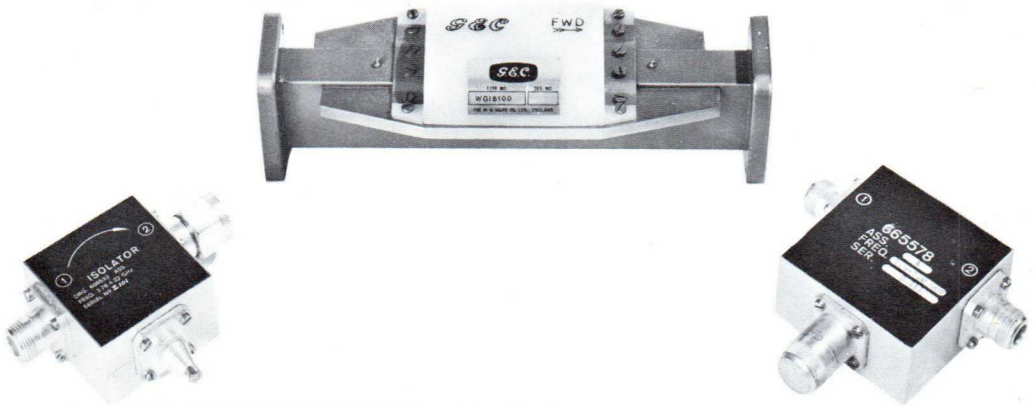
† Alternative input connections available.

MICROWAVE COMPONENTS



M-OV Waveguide Isolators

Frequency range (GHz)	Type	Bandwidth	Insertion loss (dB) Forward (max)	Insertion loss (dB) Reverse (max)	V.S.W.R.	Waveguide‡	Length (in)
3.8–4.8	**WGI8050/fo**	5%	0.60	30	1.07	WG12	6.0
5.9–6.45	**WGI6100**	as range	0.35	35	1.02	WG14	8.0
5.9–6.5	**WGI9050/fo**	5%	0.50	25	1.07	WG14	4.0
6.3–7.9	**WGI9020/fo**	2%	0.50	25	1.07	WG14	4.0
6.4–7.1	**WGI7100**	as range	0.30	30	1.05	WG14	8.0



Microwave Components 3CI210S, WGI6100 and 3CI115S

M-OV 3-Port Coaxial Circulators and Isocirculators

Configuration: T-form with either plugs or sockets on each port. Connections may also be in WG14, 15 or 16 at relevant frequencies to special order.
Temperature Performance: This is normally 0°–40°C for full bandwidth performance but can be extended by temperature compensation.
Isocirculators 3CI Series: The full range of circulators may be supplied with a built-in matched load on any specified port. This load is normally of low power (0.25 watts) but higher power loads can be fitted to special order.

Frequency range (GHz)	Type	Bandwidth	Isolation min (dB)	V.S.W.R. max	Insertion loss max (dB)	Power max (W)	Connectors
	Standard Range						
1.3–3.0	**3CC1100/fo**	10%	30	1.07	0.25	25	Type N or APC7
1.3–3.0	**3CC1200/fo**	20%	27	1.10	0.25	25	Type N or APC7
3.0–5.0	**3CC2100/fo**	10%	30	1.07	0.20	15	Type N or APC7
3.0–5.0	**3CC2200/fo**	20%	27	1.10	0.20	15	Type N or APC7
6.0–8.0	**3CC3100/fo**	10%	30	1.07	0.15	10	Type N or APC7
6.0–8.0	**3CC3101/fo**	10%	24	1.15	0.20	10	SMA
8.0–12.4	**3CC4100/fo**	10%	24	1.15	0.20	5	SMA
	Special Range						
1.7–2.0	**3CC115S**	–	30	1.07	0.20	50	Type N
1.9–2.3	**3CC120S**	–	30	1.07	0.20	50	Type N
3.7–4.2	**3CC210S**††	–	30	1.07	0.20	15	Type N
7.2–7.8	**3CC310S**††	–	30	1.07	0.12	10	Type N

‡ Rectangular flange

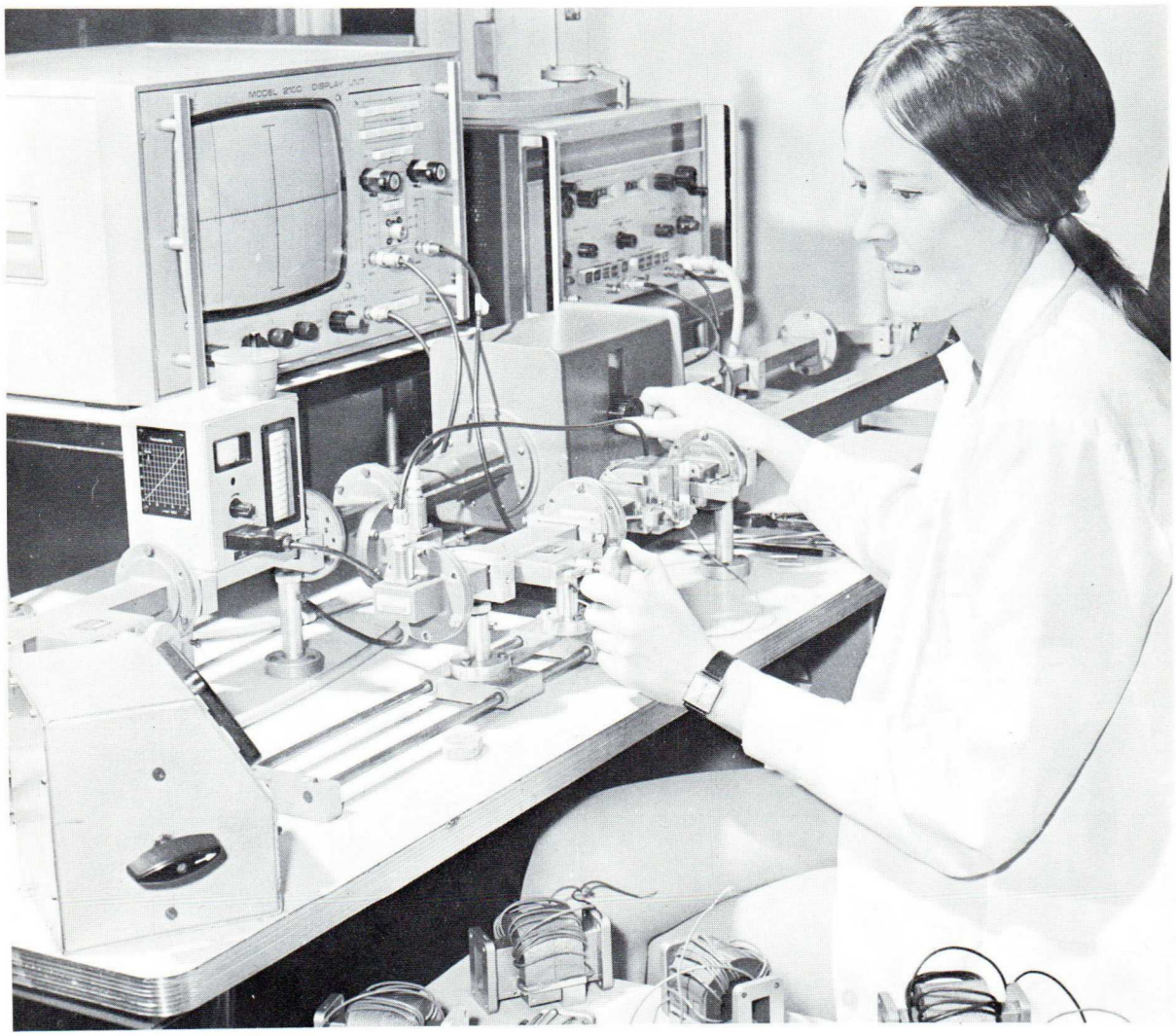
†† Temperature range ±20°C about any operating temperature from 0°C to 60°C

M-OV 5-Port Circulators

Operating frequency range (GHz)	Type	Description	Insertion loss Forward (dB)	Insertion loss Reverse (dB)	V.S.W.R.	Connectors
1.7–2.0	**5CC1151**	Two ports terminated in matched loads	0.7	45	1.07	Type N
1.9–2.3	**5CC1152**	Two ports terminated in matched loads	0.7	45	1.07	Type N

M-OV High Peak Power Circulators

Frequency range (GHz)	Type	Bandwidth	Isolation min (dB)	V.S.W.R.	Insertion loss max (dB)	Mean power (W)	Peak power (kW)	Connectors
8.2–12.4	**WGC4050/fo**	5%	27	1.10	0.15	50	5	WG16
8.2–12.4	**WGC405H/fo**	5%	20	1.22	0.5	55	50	WG16

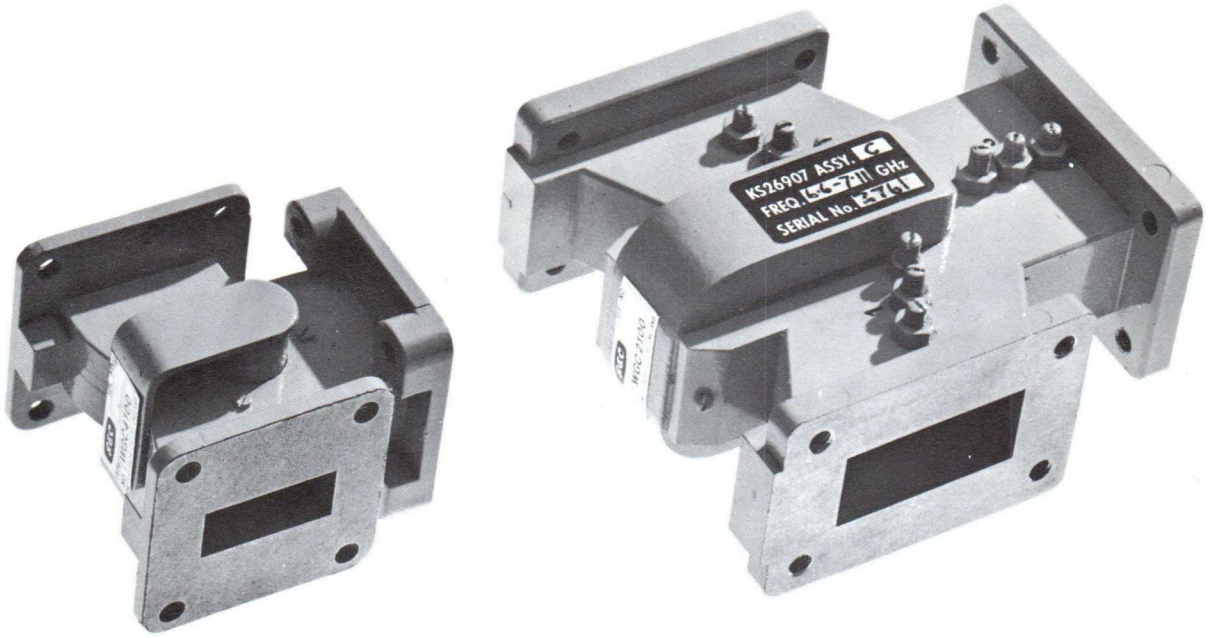


Measuring attenuation characteristics of waveguide isolators

M-OV Waveguide Circulators and Isocirculators

This range of devices uses a special form of construction avoiding the use of adhesives for holding the ferrite in position to give excellent thermal and mechanical shock resistance.
Configuration: T-form. **Temperature range:** 0–50°C.
Isocirculators WGI Series: The full range of circulators may be supplied with a built-in matched load (within the circulator housing) on any specified port. This load is of low power (2 watts) but larger loads can be fitted to special order.

Frequency range (GHz)	Type	Bandwidth	Isolation min (dB)	V.S.W.R. max	Insertion loss max (dB)	Power max (W)	Connectors
3.7–5.85	**WGC1100/fo**	10%	30	1.07	0.15	200	WG12
5.85–8.0	**WGC2100/fo**	10%	30	1.07	0.15	100	WG14
5.85–8.0	**WGC2200/fo**	20%	20	1.22	0.15	100	WG14
7.0–10.0	**WGC3100/fo**	10%	30	1.07	0.15	50	WG15
8.2–12.4	**WGC4100/fo**	10%	30	1.07	0.15	50	WG16
8.2–12.4	**WGC4200/fo**	20%	20	1.22	0.20	50	WG16
8.2–12.4	**WGC4300/fo**	30%	17	1.33	0.20	50	WG16



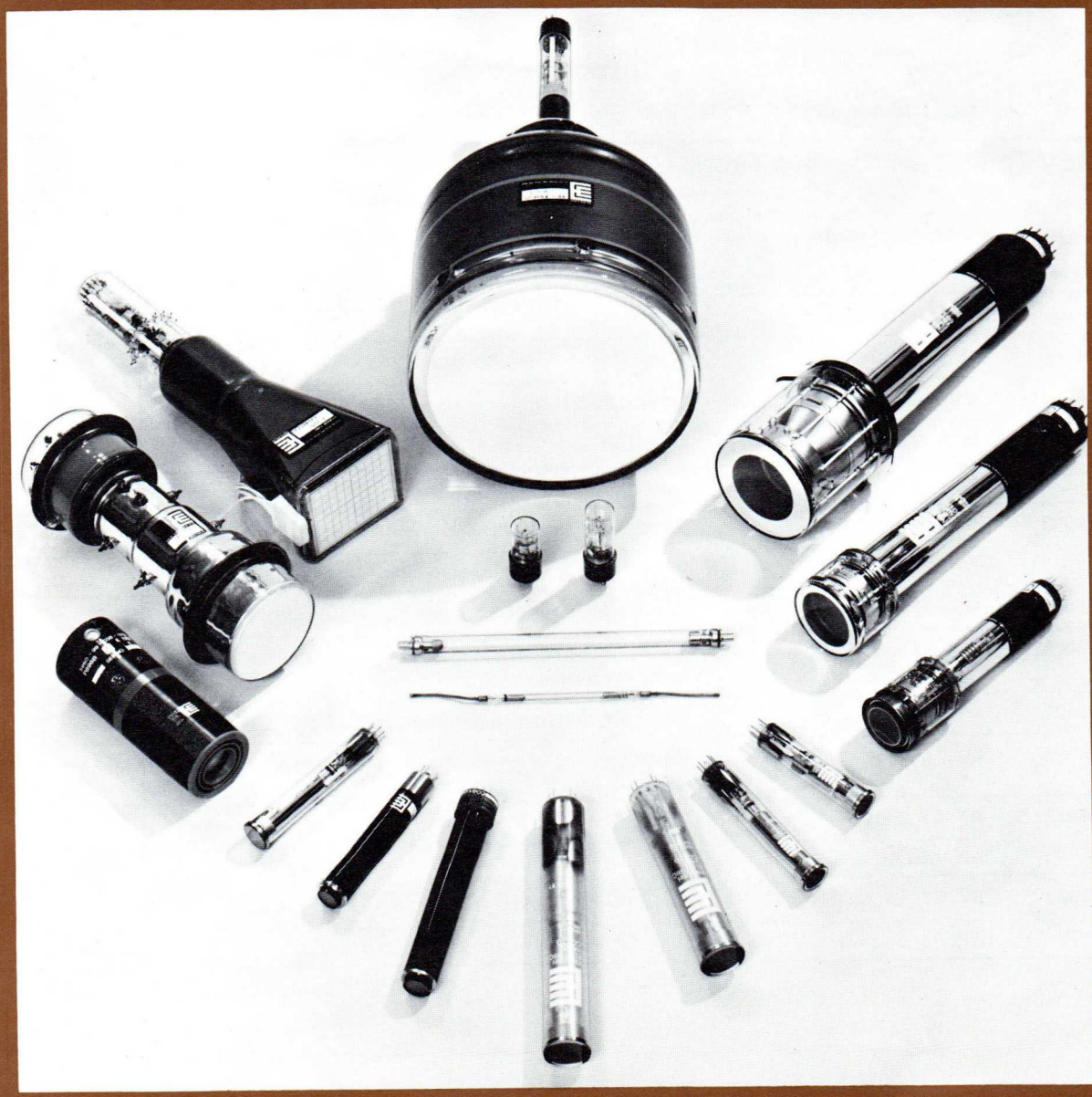
Waveguide Circulators WGC4100 and WGC2100

M-OV Transitions

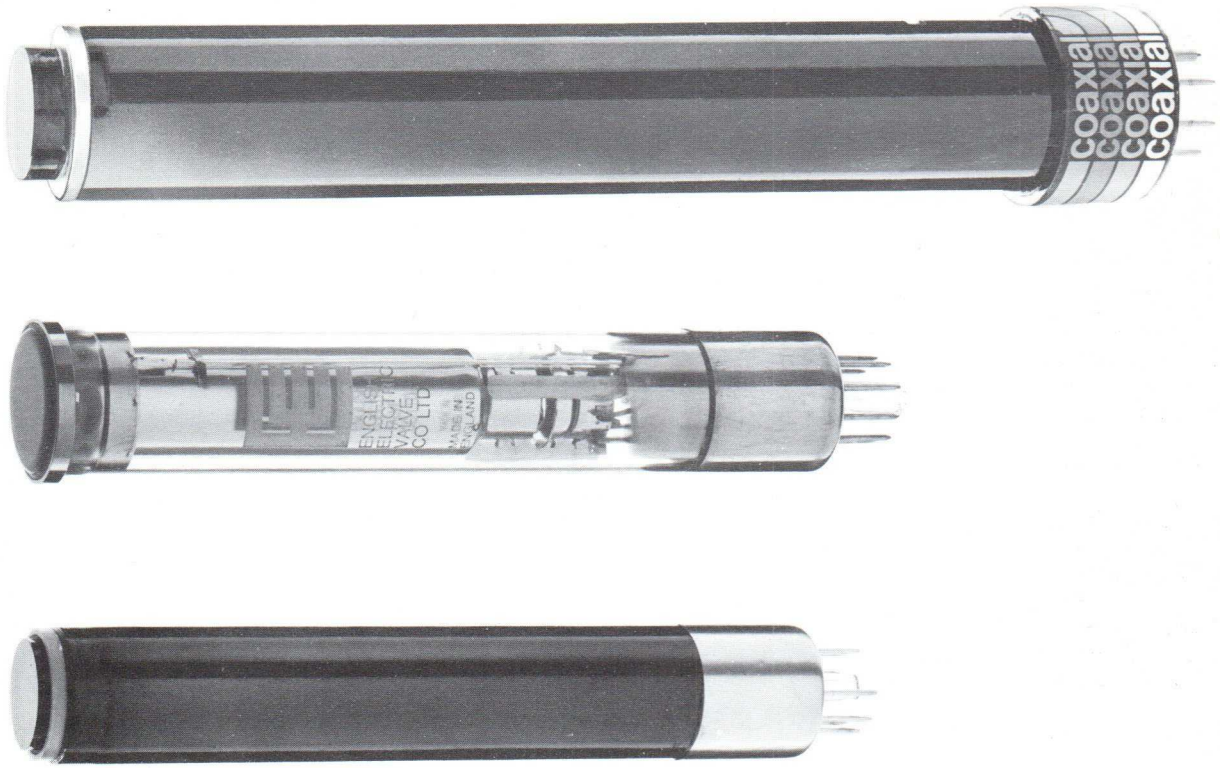
Operating frequency range (GHz)	Type	Description	V.S.W.R.	R.F. connections	
				Waveguide	Coaxial
2.5–4.1	**WTS4■**	Rear entry	0.85 (1.18)	WG10	N50 ohms
4.1–7.0	**WTC5■**	Rear entry	0.8 (1.25)	WG13	N50 ohms
7.0–11.5	**WTX6■**	Rear entry	0.85 (1.18)	WG16	N50 ohms
8.0–12.4	**WTX8■**	Rear entry	0.8 (1.25)	WG16	SMA 50 ohms
12.4–18.0	**WTJ9■**	Rear entry	0.8 (1.25)	WG18	SMA 50 ohms

■ Made to special order only

ELECTRO~OPTICAL DEVICES



Development is proceeding on a wide range of electro-optical devices and enquiries are invited for specific applications. Most of the television camera tubes can be supplied in alternative forms (radiation resistant and fibre-optic faceplates, vidicons with faceplate reticles, etc).



Leddicons (top to bottom) P8130, P8021 and P8142

EEV Television Camera Tubes — Leddicons

Photoconductive camera tubes with high sensitivity lead oxide target, for high definition pick-up in monochrome and colour broadcast cameras. Features of these tubes include very short lag, low dark current and unity gamma.

Type		
Series	**Suffix letters□**	Description
P8000	**M, B, G, L, R, X**	30mm diameter, integral mesh
	M IG, B IG, G IG, L IG, R IG	Industrial grades of above tubes
P8001	**M, B, G, L, R, X**	30mm diameter, separate mesh
	M IG, B IG, G IG, L IG, R IG	Industrial grades of above tubes
P8003	**RF, GF, LF, MF**	30mm diameter, separate mesh, with extended red response and infrared filter
	AR, AG, AL, AM	As above but without infrared filter
P8005	**M, B, G, L, R**	30mm diameter, separate mesh, with variable light bias
P8008	**M, B, G, L, R**	30mm diameter, separate mesh, with fixed light bias and highlight overload protection
P8021	**M, B, G, L, R**	1-inch diameter, separate mesh, interchangeable with comparable vidicons
P8022	**M, B, G, L, R**	1-inch diameter, separate mesh, with light bias; interchangeable with 1-inch vidicons
P8023	**RF, GF, LF, MF**	Similar to P8021 but with extended red response and infrared filter
	AR, AG, AL, AM	Similar to P8021 but with extended red response and no infrared filter
P8024	**RF, GF, LF, MF**	Similar to P8022 but with extended red response and infrared filter
	AR, AG, AL, AM	Similar to P8022 but with extended red response and no infrared filter

EEV Television Camera Tubes — Leddicons continued

Type Series	Suffix letters□	Description
P8130	M, B, G, L, R	30mm diameter, coaxial construction, with facility for integral or separate mesh operation. Fixed internal light bias
P8131	M, B, G, L, R	30mm diameter, coaxial construction, with facility for integral or separate mesh operation. Variable internal light bias
P8132	RF, GF, LF, MF	Similar to P8130 but with extended red response and infrared filter
	AR, AG, AL, AM	Similar to P8130 but with extended red response and no infrared filter
P8133	RF, GF, LF, MF	Similar to P8131 but with extended red response and infrared filter
	AR, AG, AL, AM	Similar to P8131 but with extended red response and no infrared filter
P8141	M, B, G, L, R	Rear loading version of P8021 series
P8142	M, B, G, L, R	Rear loading version of P8022 series
P8143	RF, GF, LF, MF	Rear loading version of P8023F series
	AR, AG, AL, AM	Rear loading version of P8023A series
P8144	RF, GF, LF, MF	Rear loading version of P8024F series
	AR, AG, AL, AM	Rear loading version of P8024A series

EEV Television Camera Tubes — 1-inch Vidicons
Integral Mesh, Magnetic Focus and Deflection

Type	Derivative	Application	Characteristics	Blemish standard	Heater current at 6.3V (mA)	Photo-surface (see page 69)
7735B		High quality broadcast, educational, telecine and industrial.	Very high sensitivity with colour response similar to the human eye. Short lag.	Premium	600	ii
	7735A	General purpose closed circuit systems.	High sensitivity and short lag.	1st Grade	600	ii
	7735	Industrial closed circuit systems.	Version of 7735A with relaxed blemish/electrical specification.	Commercial	600	ii
	P826/4478	Low cost industrial and surveillance.	Similar to 7735 series but with relaxed blemish specification.	Industrial	600	ii
	7262A	Monochrome broadcast, educational, industrial and surveillance where camera design necessitates a tube of reduced length.	Short version of 7735B series with the same characteristics.	†	95	ii
	7735BX	Medical use in conjunction with X-ray sensitive image intensifier.	Photosurface developed to match intensifiers with P20 phosphor.	Premium	600	v
7038		Colour or monochrome telecine and caption scanning. Can be selected for use in PE24 camera.	Medium/high sensitivity but short lag at high light levels. Resistant to image retention.	1st Grade	600	i
P8034■		Radar screen viewing. Low light level surveillance where scene motion is limited.	Very high sensitivity, long lag photosurface for normal and slow scan operation at low light levels.	†	600	iv

■ Made to special order only.

† Specific tube grades and electrical parameters can be negotiated.

□ The complete type number comprises the series number with appropriate suffix letter/letters as follows:—

B Blue channel
G Green channel
L Luminance channel
M Monochrome
R Red channel
X Medical

The letters IG added to the above indicate industrial grade.

In the case of monochrome tubes, the letter M is usually omitted from the type number.

For example, P8000 is for monochrome, P8000B is for the blue channel in broadcast cameras and P8000B IG is for the blue channel in industrial applications.

EEV Television Camera Tubes — 1-inch Vidicons
Separate Mesh, Magnetic Focus and Deflection

Type	Derivative	Application	Characteristics	Blemish standard	Heater current at 6.3V (mA)	Photo-surface (see page 69)
8507A (P841)		Broadcast, educational and high quality industrial.	Colour response similar to human eye. High sensitivity at all light levels. Moderate sensitivity to red up to 900nm. Short lag.	1st Grade	600	ii
	8507 (P848)	Industrial and educational.	High sensitivity and short lag, relaxed blemish specification.	Commercial	600	ii
	P848D	Industrial and surveillance.	P848 with relaxed specification.	Industrial	600	ii
	P841X	Medical use in conjunction with X-ray sensitive image intensifier.	Photosurface developed to match intensifiers with P20 phosphor output.	†	600	v
8541A (P842)		Broadcast, educational and high quality industrial.	Colour response similar to human eye. High sensitivity at all light levels. Moderate sensitivity to red up to 900nm. Short lag.	1st Grade	95	ii
	8541 (P849)	Industrial and educational. Replacement for P864 (near equivalent).	High sensitivity and short lag, relaxed blemish specification.	Commercial	95	ii
	P849D	Industrial and surveillance. Replacement for P862 (near equivalent).	P849 with relaxed specification.	Industrial	95	ii
	P866■	Broadcast, educational, industrial and surveillance where camera design necessitates a tube of reduced length.	Short version of the 8541A group, with the same characteristics.	†	95	ii
	P842X	Medical use in conjunction with X-ray sensitive image intensifier.	Photosurface developed to match intensifiers with P20 phosphor output.	†	95	v
8572A (P843)		Colour or monochrome telecine and caption scanning. Can be selected for use in PE24 and PE240 cameras. Available with anti-halation faceplate stud.	High sensitivity but very short lag at high light levels. Resistant to image retention.	1st Grade	600	i
P844		Colour or monochrome telecine and caption scanning.	Low power heater version of 8572A (P843)	1st Grade	95	i
8625 (P846)		Monochrome broadcast, studio and educational.	High sensitivity with very short lag at studio light levels. Improved colour rendition when used with tungsten lighting.	1st Grade	600	iii
8626 (P847)		Monochrome broadcast, studio and educational.	Low power heater version of 8625 (P846).	1st Grade	95	iii
P8031		Industrial and educational	High sensitivity and short lag. For use in cameras requiring 300mA heater.	Commercial	300	ii
P8034A		Radar screen viewing. Low light level surveillance where scene motion is limited.	High sensitivity, long lag photo-cathode for normal and slow scan operation at low light levels.	†	95	iv
P8038		Colour telecine, selected for use in TK28 camera.	High sensitivity and short lag. Signal output and resolution uniform over whole raster.	1st Grade	95	ii
P8038B		Blue channel of colour telecine, selected for use in TK28 camera.	High sensitivity and short lag. Signal output and resolution uniform over whole raster.	1st Grade	95	iii

■ Made to special order only.

† Specific tube grades and electrical parameters can be negotiated.

‡ Can be purchased with scanning/focus/alignment coil assembly.

EEV Television Camera Tubes — 1-inch Rugged Vidicons
Separate Mesh, Magnetic Focus and Deflection

Type	Application	Characteristics	Blemish standard	Heater current at 6.3V (mA)	Photo-surface (see page 69)
P831 (CV8797)	Military and industrial involving shock and vibration.	Short tube of robust construction, with electrical characteristics similar to 8541A.	†	95	ii
P863‡ (CV6243)	Military and industrial involving shock and vibration.	Developed from P831, with mesh connected to ring contact adjacent to target connection to eliminate pick-up from these leads.	1st Grade	95	ii
P8018A■	Military and industrial involving shock and vibration.	Ultra short, with integral focus and deflection coils. Robust construction.	1st Grade	95	ii
P8018B■	Military and industrial involving shock and vibration.	Same as P8018A but with signal lead brought out at base end.	1st Grade	95	ii
P8201	Military and industrial involving shock and vibration.	Very short (4 inches – 102mm) with compact integral focus and deflection coils. Robust construction.	1st Grade	95	ii

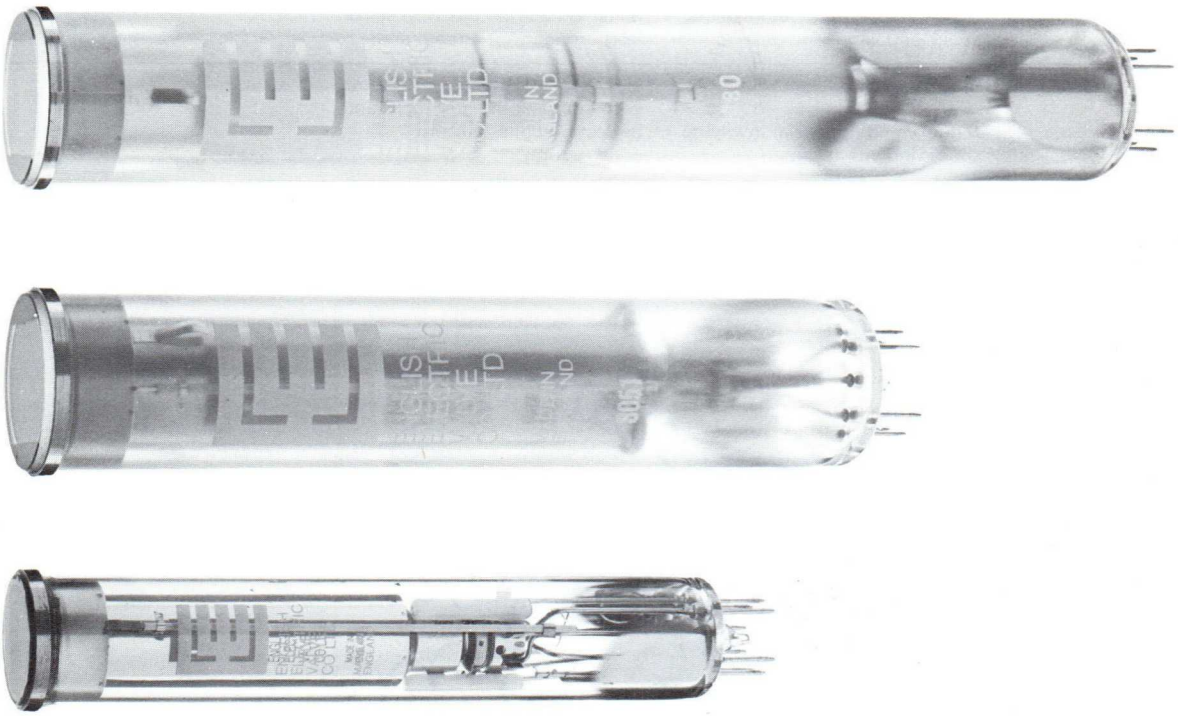
Vidicon P8018A

EEV Television Camera Tubes — I-inch Vidicons
Electrostatic Focus and Magnetic Deflection

Type	Application	Features	Blemish standard	Heater current at 6.3V (mA)	Photo-surface (see page 69)
8134	Broadcast and industrial, compact monochrome.	7735B colour response and blemish specification.	1st Grade	95	ii
8134V1/4811	Broadcast, colour, telecine. Can be supplied in matched sets for RCA TK27 camera.	Uniform sensitivity and geometry for multi-tube colour cameras. It can be selected for use in the red, blue or green channels.	Premium	95	ii
P893/4493	Red channel of RCA TK42 and TK43.	Reduced picture area of uniform sensitivity and geometry.	1st Grade	95	ii
P894/4494	Green channel of RCA TK42 and TK43.	Reduced picture area of uniform sensitivity and geometry.	1st Grade	95	ii
P895/4495	Blue channel of RCA TK42 and TK43.	Reduced picture area of uniform sensitivity and geometry.	1st Grade	95	ii

EEV Television Camera Tubes — 1½-inch Vidicons
Electrostatic Focus and Magnetic Deflection

Type	Application	Features	Blemish standard	Heater current at 6.3V (mA)	Photo-surface (see page 69)
8480	Colour or monochrome cameras, telecine and high grade industrial.	Low deflection power, negligible electrostatic focusing power. Reduced camera size by eliminating focus coil. High resolution.	1st Grade	95	i
8480V1/4810	High quality colour cameras such as RCA TK27.	Similar to 8480 but tested to closer limits for signal uniformity, beam astigmatism and other characteristics.	Selected	95	i



Vidicons (top to bottom) 8480V1, 8051 and P8090

EEV Television Camera Tubes — 1½-inch Vidicons
Separate Mesh, Magnetic Focus and Deflection

Type	Application	Features	Blemish standard	Heater current at 6.3V (mA)	Photo-surface (see page 69)
8051■	Broadcast telecine or high resolution data transmission.	Limiting resolution in the region of 2000 TV lines. Very short lag at high light levels.	1st Grade	600	i
8521■	High grade industrial.	Colour response similar to that of human eye.	1st Grade	600	ii

EEV Television Camera Tube — Pyroelectric Vidicon

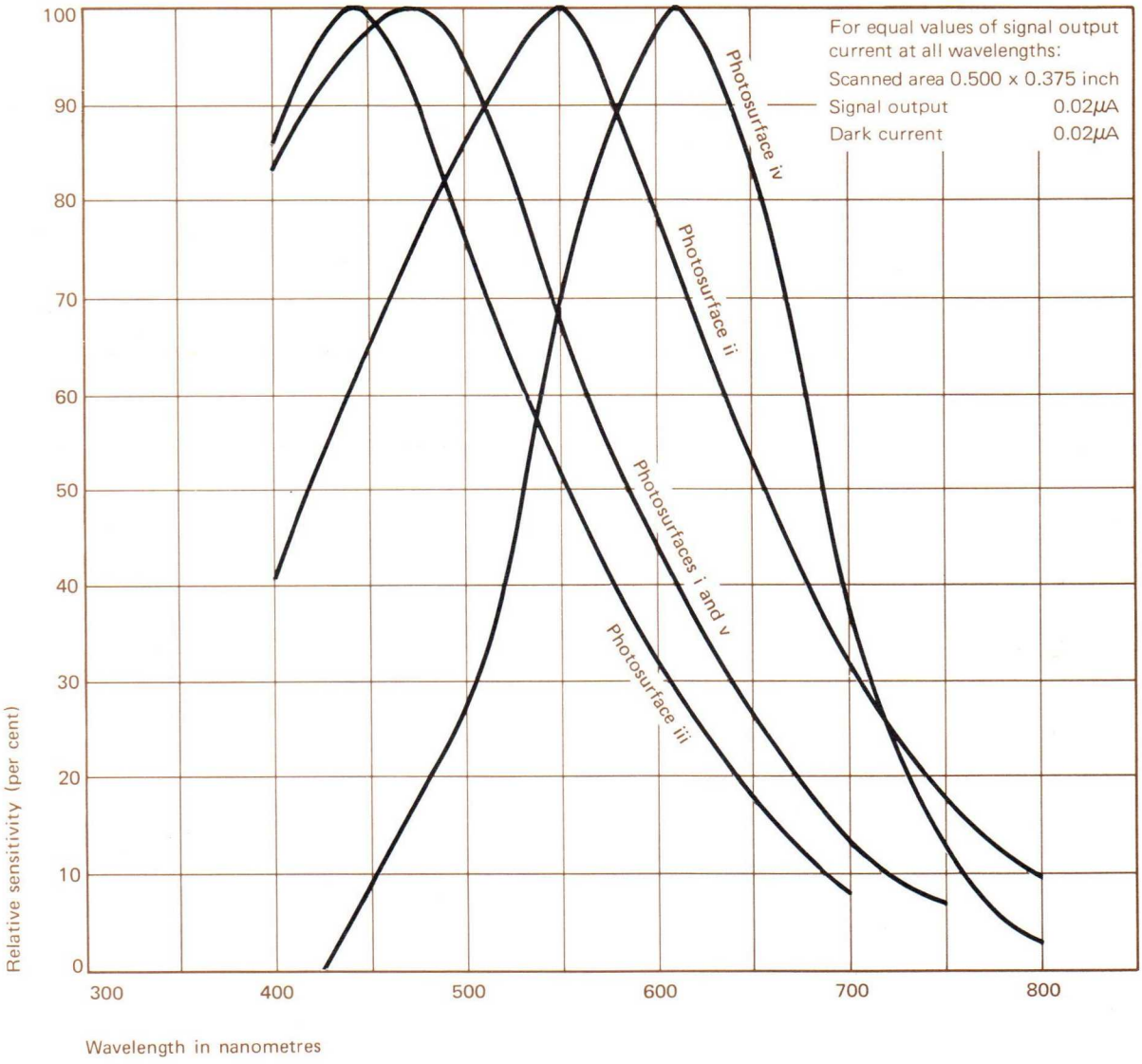
Type	Application	Description
P8090‡	Infrared imaging	Maximum sensitivity in the 8 to 14 micron band, with thermal resolution better than 0.2°C. Mechanically similar to 1-inch separate mesh vidicons.

‡ EEV test camera P4176 is available to special order for evaluation of P8090 pyroelectric vidicon.

■ Made to special order only.

EEV Vidicon Photosurfaces

Type	Description
Photosurface i	High sensitivity photosurface with very short lag at high light levels. Resistant to image retention and intended for colour or monochrome telecine and caption scanning.
Photosurface ii	The colour response peaks in the green region and extends into the near infrared; near panchromatic response is obtained in daylight. This photosurface provides higher sensitivity than type i and has high sensitivity at both high and low light levels. It must not be exposed to bright lights for long periods.
Photosurface iii	This photosurface is similar in sensitivity to type ii but its colour response peaks in the blue region. It provides improved colour rendition with tungsten illumination. It has extremely short lag when used at light levels of 1–10 ft-candles incident on the faceplate.
Photosurface iv	This photosurface has been specially designed with long lag characteristics. It is intended for integrating repetitive light inputs of low level such as from X-ray image intensifier screens or cathode ray tube displays.
Photosurface v	High sensitivity, medium lag photosurface developed for use with X-ray image intensifiers. The spectral response is very similar to photosurface iii and is well matched to P20 phosphor.



EEV Television Camera Tubes — Image Orthicons

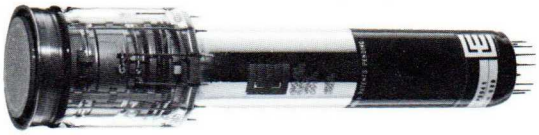
Size	Nominal image diagonal	Type	Application	Description
3-inch	1.60 inch	**P874**†	High quality studio and outdoor broadcast, monochrome or colour.	High target capacitance and signal to noise ratio.
3-inch	1.60 inch	**P875**†	High quality studio and outdoor broadcast, monochrome or colour.	Similar to P874 but with lower target capacitance.
3-inch	1.60 inch	**P882**†	High quality studio and outdoor broadcast.	Similar to P874, with bialkali photocathode giving increased sensitivity.
3-inch	1.60 inch	**P883**†	High quality studio and outdoor broadcast.	Similar to P875, with bialkali photocathode giving increased sensitivity. Lower target capacitance than P882.
4½-inch	1.60 inch	**7295C (P811/E)**	High quality studio and outdoor broadcast.	Medium target capacitance producing approximately half power law gamma when operated one stop above the 'knee'. Unilateral replacement for 7295B. Higher signal to noise ratio and resolution than 3-inch tubes with similar target spacing.
4½-inch	1.60 inch	**7389C (P822/E)**	For use in studios under controlled lighting conditions. Recommended for use in cameras containing gamma correction circuits.	Tube with higher target capacitance than the 7295C. Minimal spurious signals enabling pictures of photographic quality to be produced. The higher target capacitance gives improved signal to noise ratio and extended linear transfer characteristics. Unilateral replacement for 7389B.
4½-inch	1.60 inch	**P858**	For use as the luminance tube in colour cameras such as TK42/43. Equally suitable for monochrome cameras.	Tube tested for operation at target voltage up to 4 volts.
4½-inch	1.60 inch	**P872**	For use in studios under controlled lighting conditions. Recommended for use in cameras containing gamma correction circuits.	Similar to 7389C, with bialkali photocathode giving increased sensitivity.
4½-inch	1.60 inch	**P873**	High quality studio and outdoor broadcast.	Similar to 7295C, with bialkali photocathode giving increased sensitivity.

Image Orthicons P875 (top) and 7295C

Note All the Image Orthicons listed incorporate the ELCON target, (Brit. pat. no. 1048390). The use of ELCON targets results in the virtual elimination of image retention (sticking) and gives stability of sensitivity throughout tube life.

† All EEV 3-inch image orthicons incorporate an anti-ghost image section, a field mesh and a suppressor electrode. Features resulting from the design include the elimination of dynode background and an improved signal to noise ratio.

55mm Image Isocon P8041 (top), 3-inch type P880 (centre) and 4½-inch type P850 (bottom)



EEV Television Camera Tubes — Image Isocons

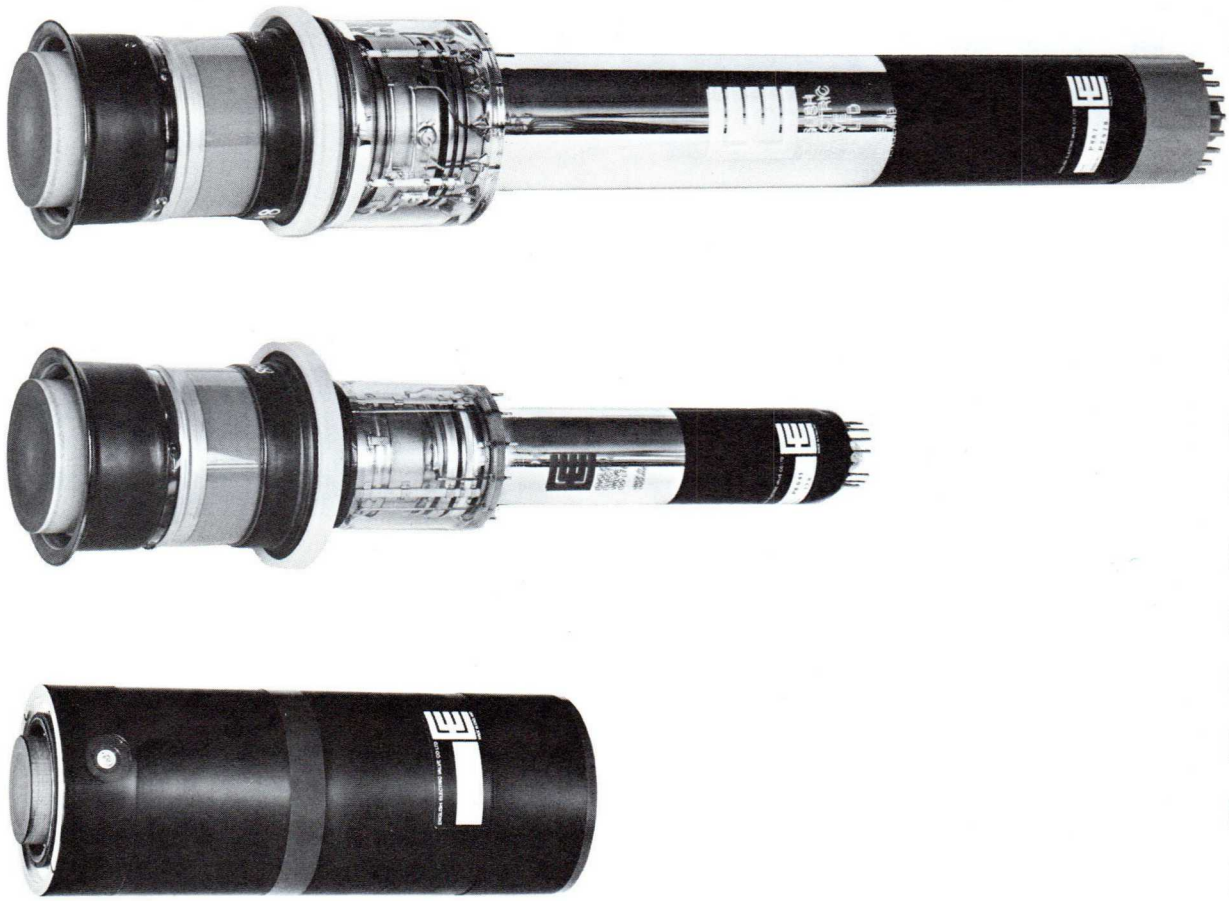
With a fixed beam current, image isocons will reproduce scenes having a wide dynamic range, with good tonal response and without the beam noise associated with image orthicons.

Size	Nominal image diagonal	Type	Application	Description
55mm	40mm	**P8040**	Television pick-up at very low light levels (moonlight conditions).	High sensitivity tube with plain glass faceplate. It is particularly suitable where high performance from a small camera is required. The tube can be supplied fitted with a deflection yoke.
55mm	40mm	**P8041**	Television pick-up at very low light levels (moonlight conditions).	High sensitivity tube, identical with P8040 but with fibre-optic faceplate.
3-inch	1.60 inch	**P880**	Television pick-up at very low light levels. It can also be used in X-ray applications.	High sensitivity tube, externally similar to image orthicon; most image orthicon cameras can readily be modified to accept it.
3-inch	40mm	**P887**	Television pick-up at very low light levels (moonlight conditions).	Similar to P880 with fibre-optic face-plate for coupling to image intensifiers.
4½-inch	3.25 inch	**P850**	Television pick-up from very low intensity images of X-ray fluoroscopic screens, and similar applications at very low light levels.	High sensitivity tube with curved faceplate.

Note Test camera P4150 can be supplied to special order, for test and evaluation of 3-inch and 55mm tubes.

EEV Television Camera Tubes — Intensifier Image Isocons

Isocon size	Nominal image diagonal	Type	Application	Description
55mm	40mm	**P8096■**	Television pick-up at very low light levels (starlight conditions).	Combination of 55mm image isocon and a single stage intensifier with fibre-optic coupling. It operates with a scene illumination of 10^{-4} ft-candle.
3-inch	40mm	**P8095■**	Television pick-up at very low light levels (starlight conditions).	Combination of 3-inch image isocon and a single stage intensifier with fibre-optic coupling. It operates with a scene illumination of 10^{-4} ft-candle.



Intensifier Image Isocon P8095 (top), P8096 (centre) and Image Intensifier P896A (bottom)

EEV Image Intensifiers

3-stage, fibre-optic coupled image intensifier assembly for night vision applications, encapsulated in silicone rubber complete with e.h.t. multiplier. The input is S25 and a P20 phosphor is used for the output screen.

Useful diameter (mm)	Type	Magnification (approx)	Luminance gain (apostilb/lux) (min)	Equivalent background illuminance (lux) (max)	Resolution at centre (min) (line pairs/mm)
25	**P896A†**	0.82 to 1.0	5×10^4	2×10^{-7}	30
25	**P8076A‡**	0.82 to 1.0	5×10^4	2×10^{-7}	30

† A.C. input voltage 2.7kV peak to peak.

‡ D.C. input voltage 6.75V. Internal automatic brightness control.

Note Test camera P4150 can be supplied to special order, for test and evaluation of 3-inch and 55mm tubes.

■ Made to special order only.

EEV Proximity Focused Image Intensifiers

This series of high gain proximity focused image intensifiers is available for applications where size, weight and image uniformity are of importance. The standard versions have an S25 photocathode on a fibre-optic faceplate, with P20 phosphor and fibre-optic output window. An anti-halation phosphor screen backing which ensures good low spatial frequency contrast at the operating voltage of 8kV is incorporated as standard. Other photocathodes and input faceplate materials are available.

Image diameter (mm)	Type	Photo-cathode luminous sensitivity (μA/lm)	Photo-cathode radiant sensitivity at 850nm (mA/W)	Limiting resolution (line pairs/mm)	Luminous gain (ft-L/ft-candle)	Magnifi-cation	Noise-equivalent input (μlux)
18	**P8101**	350	10	40	50	1.0	0.2
25	**P8102**	350	10	40	50	1.0	0.2
40	**P8103**	350	10	40	50	1.0	0.2
75	**P8104**	350	10	40	50	1.0	0.2

EEV Shutter Tubes

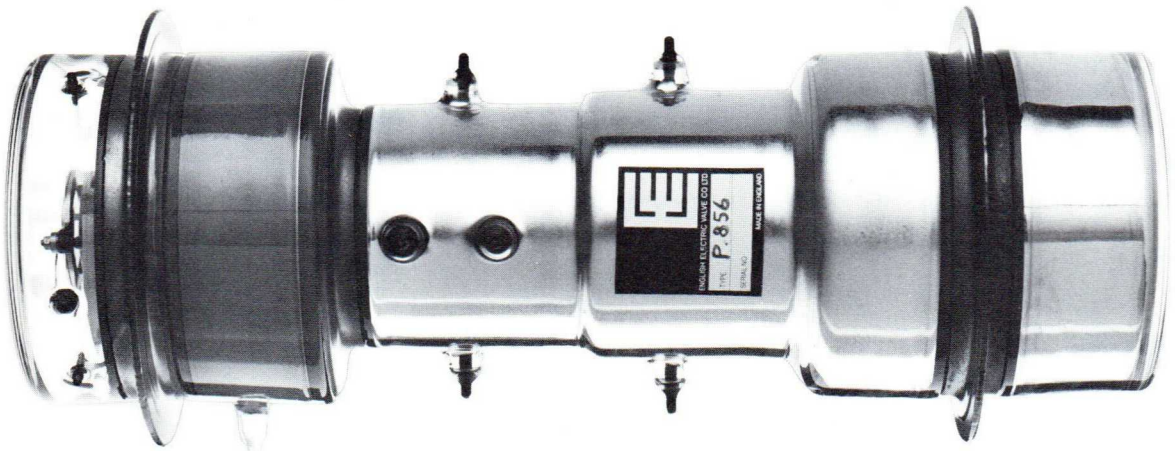
Electrostatically focused image converters with electrostatic deflectors, for both pulse and sweep operation; the deflection system enables the tubes to function as an electronic shutter.

When used in a suitable camera* the tubes can display a sequence of frames showing the development of a high speed event.

The tubes are available with an output faceplate of either plain glass or fibre-optic of 90mm diameter; the useful screen diameter is 75mm.

Useful screen area (mm)	Type	Structure	Equivalent light input (max) (ft-candle)	Static resolution (min) (line pairs/mm)	Photo-cathode▲	Screen●	Operating voltage (kV)
75 x 40	**P855**	Tetrode	10^{-6}	13	S20	P11	16
75 x 40	**P856**	Triode	10^{-6}	13	S20	P11	18

Shutter Tube P856



* Available from John Hadland Ltd., Newhouse Laboratories, Bovingdon, Herts.

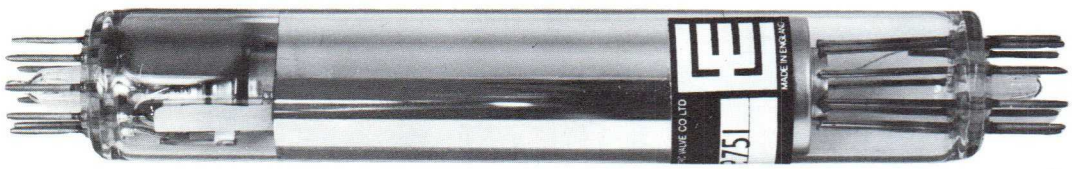
▲ Also available to special order with S1, S9, S11 or S25 photocathode.

● Also available to special order with P20 screen.

EEV Storage Tubes

Useful screen size	Type	Description	Typical brightness (ft-lamberts)	Deflection
–	**EP751**	Single gun storage tube, electrical input and output, with a silicon target and a modified short vidicon envelope. Used for video information storage, scan conversion, image integration.	–	Magnetic
4.0 inches (10.2cm) dia.	**E702A (CV5877)**	Direct view storage tube recommended for radar applications.	900	Electrostatic
4.0 inches (10.2cm) dia.	**E702E**	Direct view storage tube recommended for radar, medical and picture storage applications. Similar to E702A but gives improved uniformity of erasure.	900	Electrostatic
4.0 inches (10.2cm) dia.	**E713B (CV9422)**	Direct view storage tube recommended for radar applications under limited vibration conditions.	1800	Magnetic
4.0 inches (10.2cm) dia.	**E724**	Direct view storage tube encapsulated in a magnetic shield. It is recommended as a replacement tube for use in the Bendix airborne weather radar.	1800	Magnetic
10 div. x 8 div. (9cm x 7.2cm) rectangular	**E720A**	Direct view storage cathode ray oscilloscope tube with single-beam writing gun. It has encapsulated screen lead and internal graticule. Normally used in half-tone mode, but it will also operate as a P.D.A. oscilloscope tube without storage.	200	Electrostatic
10 div. x 8 div. (9cm x 7.2cm) rectangular	**E720B**	Direct view storage oscilloscope tube with split-beam writing gun. It has encapsulated screen lead and internal graticule. Normally used in half-tone mode, but it will also operate as a P.D.A. oscilloscope tube without storage.	150	Electrostatic
10 div. x 8 div. (9cm x 7.2cm) rectangular	**E720C**	Direct view storage oscilloscope tube, shorter than E720A with reduced deflection sensitivity. Normally used in half-tone mode, but will also operate as a P.D.A. oscilloscope tube without storage.	200	Electrostatic
10 div. x 8 div. (9cm x 7.2cm) rectangular	**E720D**	Direct view storage oscilloscope tube similar to the E720A but with the writing speed capability increased by a factor of 50.	180	Electrostatic
10 div. x 8 div. (9cm x 7.2cm) rectangular	**E720E**	Direct view storage oscilloscope tube similar to the E720B but with the writing speed capability increased by a factor of 50.	140	Electrostatic

Storage Tube EP751



Direct View Storage Cathode Ray Oscilloscope Tube E720A

EEV Storage Tubes continued

Useful screen size	Type	Description	Typical brightness (ft-lamberts)	Deflection
10 div. x 8 div. (9cm x 7.2cm) rectangular	**E725**	Direct view storage oscilloscope tube with writing gun characteristics similar to E720A but incorporating an additional high speed target and charge transfer mechanism giving a writing speed capability in excess of 100cm/μs with a storage time of several minutes.	160	Electrostatic
10cm x 6cm rectangular	**E714C**	Direct view storage cathode ray oscilloscope tube with single-beam writing gun. It has encapsulated screen lead and internal graticule. Normally used in half-tone mode, but it will also operate as a P.D.A. oscilloscope tube without storage.	200	Electrostatic
9.0 inches (22.9cm) dia.	**E712A**	Direct view storage tube recommended for radar and data terminal applications. Selective erasure is possible by voltage switching.	1000	Magnetic

Storage Tubes E712A (top) and E725

EEV Glow Modulators

Crater diameter (inch)	Type	Luminance min† (candela/in^2)	Luminous intensity min† (candela)	Peak cathode current max (mA)	Average cathode current range (mA)	Break-down voltage max (V)	Operating voltage max† (V)
0.016	**XL632**	550	0.11	35	0.25–25	225	150*
0.028	**XL601**	550	0.27	45	0.25–30	225	150*
0.028	**XL627**§	Rugged version of XL601 in metal envelope					
0.028	**XL631**	550	0.27	45	0.25–30	225	150*
0.028	**XL635**§	‡	‡	40	0.5–40	270	180★
0.028	**XL641**	650	0.4	100	1.0–70	225	150
0.060	**1B59**	110	0.3	75	5.0–35	225	150
0.060	**XL603**	137	0.375	75	5.0–30	225	150

* At 20mA d.c.
† At 30mA d.c.
§ Rugged.
★ At 25mA d.c.
‡ Red enhanced output.

EEV Flash Tubes

EEV produces a complete range of linear flash tubes for operation at medium and high energy loadings.

The following list shows the minimum and maximum arc lengths available for flash tubes of standard manufacture, arranged in order of bore diameter. Flash tubes of any arc length between the limits shown can be supplied; full technical specifications are available on request.

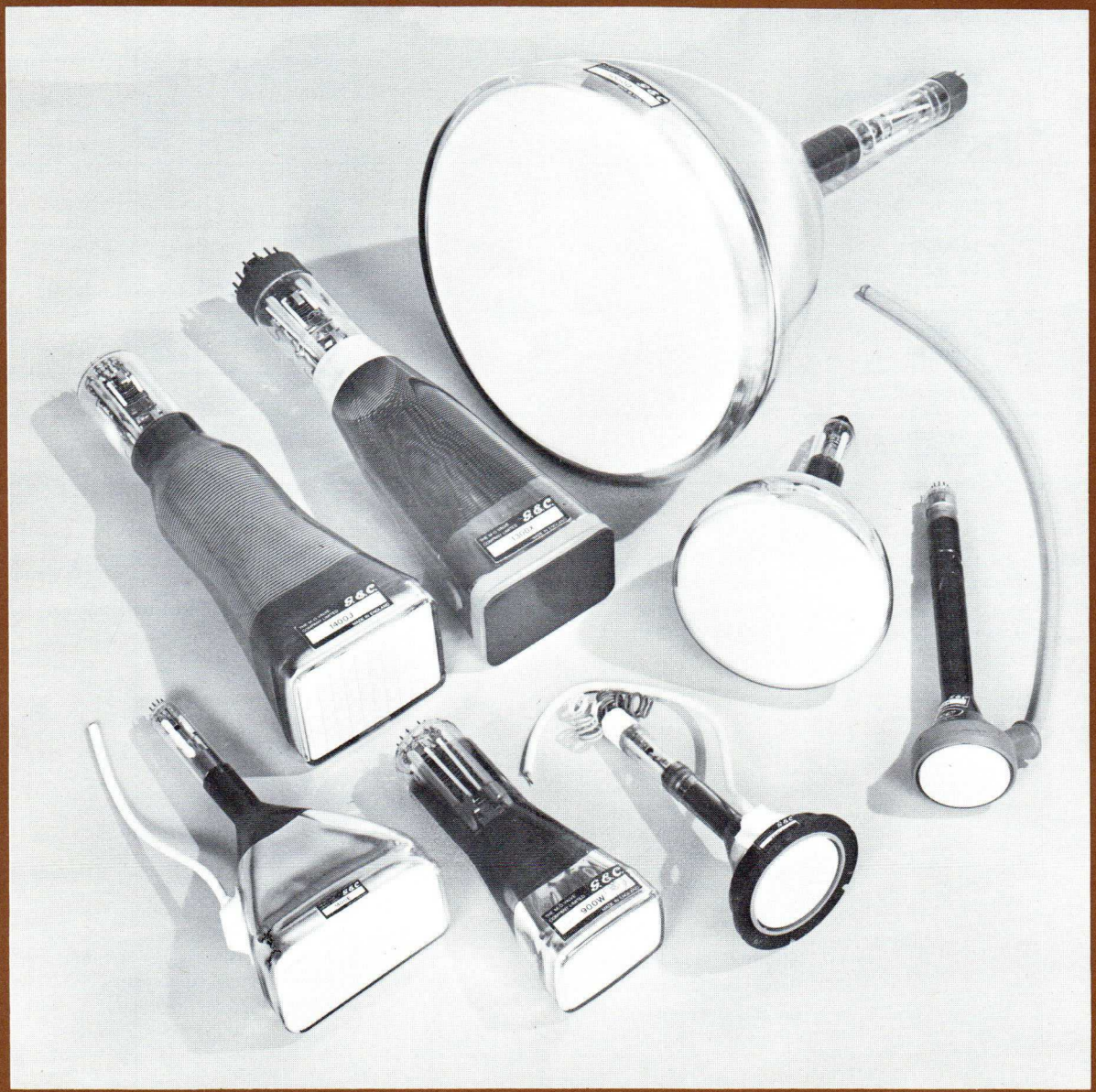
The XL639 series of flash tubes are of 'bright seal' design and can be supplied in bore diameters additional to those listed.

The XL615 series are of 'solder seal' design and can only be produced in the standard bore diameters shown below.

Bore diameter (mm)	Type	Arc length range (inches)	Operating voltage (kV) minimum	Operating voltage (kV) maximum	Trigger voltage (kV)	Input energy (joules)†
	XL639/2/0.5	0.5 to	0.4	1.2	10	60
2.0	**XL639/2/5**	5.0	0.85	2.0	16	670
	XL639/3/0.75	0.75 to	0.45	1.3	10	120
3.0	**XL639/3/7**	7.0	1.1	3.2	16	1400
	XL639/4/1	1.0 to	0.45	1.3	12	220
4.0	**XL639/4/9**	9.0	1.3	3.8	16	2400
	XL639/5/1	1.0 to	0.5	1.4	16	335
5.0	**XL639/5/12**	12	1.6	4.5	16	4000
	XL639/6/2	2.0 to	0.55	1.7	16	800
6.0	**XL639/6/12**	12	1.6	4.7	16	4800
	XL639/7/3	3.0 to	0.6	2.0	16	1400
7.0	**XL639/7/24**	24	3.0	8.2	16	11200
	XL639/8/3	3.0 to	0.65	2.0	18	1600
8.0	**XL639/8/24**	24	3.0	8.2	18	12800
	XL639/10/3	3.0 to	0.65	2.0	20	2000
10	**XL639/10/24**	24	3.0	8.2	25	16000
	XL639/12/3	3.0 to	0.65	2.0	20	2400
12	**XL639/12/24**	24	3.0	8.2	25	19300
	XL639/13/3	3.0 to	0.65	2.0	20	2600
13	**XL639/13/24**	24	3.0	8.2	25	21000
	XL639/15/4	4.0 to	0.75	2.3	20	4000
15	**XL639/15/36**	36	4.0	12	30	36000
	XL639/19/6	6.0 to	1.0	2.9	25	7600
19	**XL639/19/48**	48	5.2	15.6	30	61000
	XL615/4/1	1.0 to	0.5	1.5	12	280
4.0	**XL615/4/6**	6.0	1.0	3.0	12	1640
	XL615/7/2	2.0 to	1.0	3.0	12	960
7.0	**XL615/7/6**	6.0	1.0	3.0	16	2870
	XL615/9/4	4.0 to	1.0	3.0	16	2460
9.0	**XL615/9/10**	10	1.0	3.0	16	6140
	XL615/10/4	4.0 to	1.0	3.0	16	2730
10	**XL615/10/12**	12	1.5	3.0	25	8180
10	**XL615/10/40**	40	3.0	5.0	25	27260
	XL615/13/6	6.0 to	1.0	3.0	25	5320
13	**XL615/13/14**	14	1.5	3.0	25	12410

† Explosion limit in free air, pulse duration 500μs.

CATHODE RAY TUBES



M-OV Radar and Data Display Tubes (Magnetically Deflected)

Screen size (cm)	Type	Overall length (mm)	Deflection angle (deg)	Final anode voltage (kV)	Focus voltage (V)	Anode 1 voltage (V)	Cut-off voltage max (V)	Base
11	**AL13-36**	308	53	12	−200 to 200	300	−70	B12A
13.2 x 8.0	**1478E (CV6229)**	268	44	17.5	−330 to 0	−330† to −60	V_k 20	B9A/D
15.2	**1578A** **1578B**	241	53	9	0 to −400	400	−70	B8H
16	**F16-10LD**	370	37	12	0 to 400	500	−44	B8H
18.2	**7ABP7A (CV8114)**■ **7ABP33A**	342.5	52	7	−100 to 150	300	−77	B12A
19 x 16	**2168A**☆ **T9017W**§	290	70	14	−50 to 400	400	−75	Flying lead
21.4	**F21-10LD (CV10757)**	460	41	14	0 to 400	600	V_k 30-45	B8H
22.8	**2273D**	408	58	12	±200	300	−70	B12A
22.8	**2269Y (CV2463)**	477	40	15	magnetic	–	−100	B12A
31	**3069M**△	520	50	15	magnetic	–	−90	B12A
31	**3069Q (CV9335)***■ **3073Q (CV5819)** **3096Q**	485	50	12	±200	300	−70	B12A
31	**3069R** **3077R**■ **3079R**■ **3096R**■	572	40	16	−150 to 300	550	−65	B8H
31	**MF31-55 (CV429)**■ **(Tet)**	520	50	15	magnetic	300	−90	B12A
31	**T957Y (CV5819)** **T957Z (CV9335)**	494	50	12	±200	300	−70	B12A
31	**T963Z (CV6167)**△	640	50	15	magnetic	300	−150	B12A
31	**T988S**■ **T988Z (CV10951)**■	540	50	15	0 to 400	300	−70	B12A
31	**T989S**■ **T989Z (CV6172)** **(CV10949)**■	520	50	15	magnetic	300	−90	B12A
41	**4169B**■ **4196B**■	612.5	50	18	±200	300	−85	B12A
41	**MF41-10**△	518	70	12	magnetic	300	−70	B12A
41	**T983S**■ **T983Z**■	650	50	15	0 to 400	300	−70	B12A

TPD Transistor protection device or TPD is an effective means of limiting the energy dissipated in transistor circuitry connected to the electrodes of a radar cathode ray tube in the event of voltage flashover.

It can be provided as an optional extra on most M-OV radar tubes and supplements the protection that the principal radar manufacturers build into their equipments.

† Adjusted for cut-off
☆ Bezel has metric thread
§ Bezel has imperial thread

△ Maintenance type, not recommended for use in new equipment.
■ Made to special order only.
* Near equivalent.

M-OV Avionic Tubes (Magnetically Deflected)

Screen size (cm)	Type	Overall length (mm)	Deflection angle (deg)	Final anode voltage (kV)	Focus voltage (V)	Cut-off voltage max (V)	Base
7	**769H (CV6217)**	259	35	30	magnetic	−100	B9A
7	**751J**	195	45	15	magnetic	−50	Flying lead
11.5 x 8.5	**F13-110GR**	230	60	10	1000 to 1500	−70	Flying lead
13.2 x 8.0	**1478E (CV6229)**	268	44	17.5	−330 to 0	V_k 20	B9A/D

M-OV Monitor Cathode Ray Tubes (Electrostatic Focus and Deflection)

Screen size (cm)	Type	Overall length (mm)	Deflection angle (deg)	Final anode voltage (kV)	Focus voltage (V)	Anode 1 voltage (V)	Cut-off voltage max (V)	Base
31.7 x 24.7	**AW36-48**	455	65	14	±200	300	−70	B12A

M-OV Projection TV Tubes (Magnetically Focused and Deflected)

Screen size (cm)	Type	Face radius (mm)	Overall length (mm)	Deflection angle (deg)	Final anode voltage (kV)	Cut-off voltage max (V)	Base
14	**T940B (CV10704)** **T940G (CV10705)** **T940R (CV10703)** **T940W**	210	434	47	50	−170	B12A

M-OV Viewfinder Tubes(Electrostatic Focus and Deflection)

Screen size (cm)	Type	Overall length (mm)	Deflection angle (deg)	Final anode voltage (kV)	Focus voltage (V)	Anode 1 voltage (V)	Cut-off voltage max (V)	Base
14.2 x 10.9	**AW17-20**	345	44	12	±200	300	−80	B12A

M-OV Fibre Optic Cathode Ray Tubes

Screen size (cm)	Type	Overall length (mm)	Numerical aperture	Final anode voltage (kV)	Cut-off voltage max (V)	Sensitivity x (V/cm)	Sensitivity y (V/cm)	Base	Class (see footnotes)
8 x 11	**1358X**	380	0.72	6††	−90	29	16	B14A	EE
12.7 x 12.7	**1774A**	305	0.66	10	−110	–	–	B9A/D	MM
12.7 x 12.7	**1774B**	305	0.40	10	−110	–	–	B9A/D	MM

CLASS

(First letter denotes focus, second letter denotes deflection)

E Electrostatic

M Magnetic

M-OV Instrument Tubes — Single Gun (Electrostatic Focus and Deflection)

Screen size (cm)	Type	Overall length (mm)	Anode 1 voltage (kV)	PDA voltage (kV)	Cut-off voltage max (V)	Sensitivity x (V/cm)	Sensitivity y (V/cm)	Base
4	**CV1522**	165	0.8	–	–14	83.5	92.5	B9
4.8 x 2.4	**724E**	215	2.0	–	–100	46	100	B12A
7 x 5	**974W** **996W**	230	0.6	6.0	–65	13.8	9.6	B12F
7.8	**CR144A (CV8632)**	257	0.6	1.8	–40	22	13	Flying lead
10 x 6	**1374Q**■	335	0.9	9.0	–84	13.5	4.5	B12F
10 x 6	**D13-47GH** **D13-47GM**	368	1.0	4.0	–65	17.5	8.3	B12F
10 x 8	**1424A**■ **1424A/G1**■ **1446A/G1**■ **1468A**■	368	1.0	4.0	–65	18	9.5	B12F
10 x 8	**1474B** **1496B**■	350	1.2	12	–80	11	5.3	B12F
10 x 8	**1424J**■ **1424J/G4** **1446J/G4**	388	1.0	4.0	–65	17	8.7	B12F
13	**1324Y** **1346Y**	371	1.0	4.0	–75	18	9.2	B12F
13	**1324Z**■ **1346Z**■	371	1.0	3.0	–70	18	9.0	B12F
13	**CV9510**	528	1.5	15	–85	12.3	3.2	B12F
15.4 x 20	**2196D**	386	1.45	9.0	–80	13	9.0	B12F
18	**1824A**■ **1846A**■	473	2.0	6.0	–110	24	14	B12F
20 x 15.4	**2174C** **2196C**	386	1.45	9.0	–80	13	9.0	B12F

M-OV Instrument Tubes — Double Gun (Electrostatic Focus and Deflection)

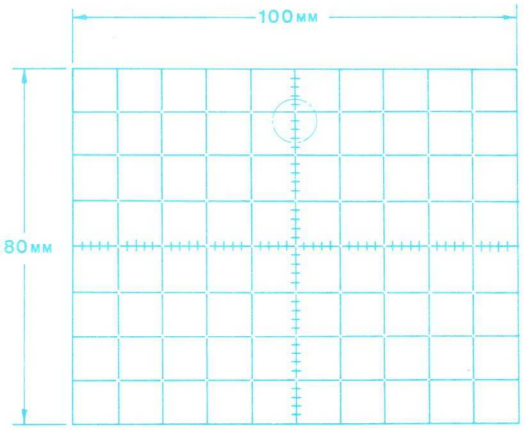
Screen size (cm)	Type	Overall length (mm)	Anode 1 voltage (kV)	PDA voltage (kV)	Cut-off voltage max (V)	Sensitivity x (V/cm)	Sensitivity y (V/cm)	Base
10	**1074H**	386	1.2	4.5	–72	21	8.0	B12F
13	**1324A/2**	432	1.5	3	–58	30	20	B12F
13	**1324M**■ **1325M**■ **1346M**■	386	1.0	4.0	–60	21	6.6	B12F
12.4 x 9.3	**E14-110GM**	390	0.8	8.0	–100	10	4.0	B12F

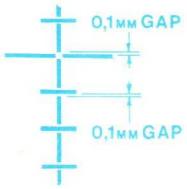
■ Made to special order only

M-OV Instrument Tube Graticules

The graticules shown below can be applied to most rectangular flat faced instrument tubes, to special order.

Graticule G1 — Black

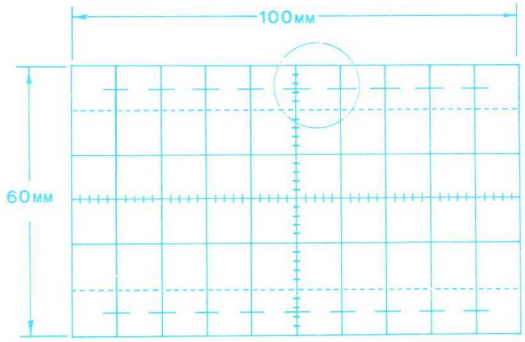


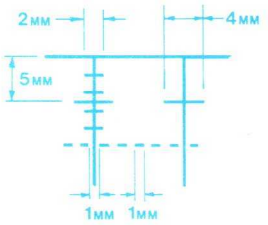


WIDTH OF ALL LINES 0,3 MM

ENLARGED DETAIL OF PART MARKED

Graticule G3 — White

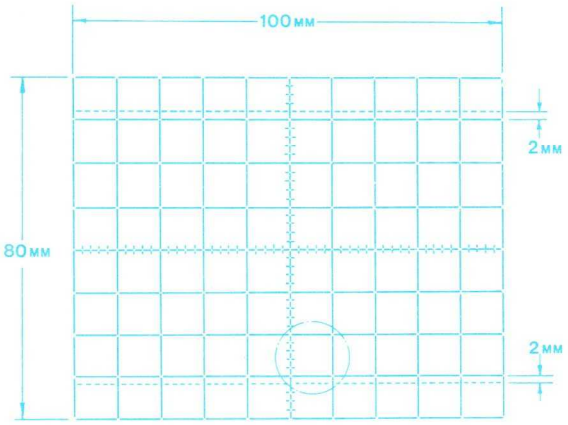


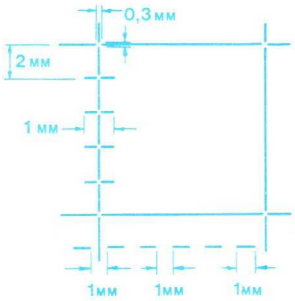


WIDTH OF ALL LINES 0,4 MM

ENLARGED DETAIL OF PART MARKED

Graticules G4 — Black
G5 — White

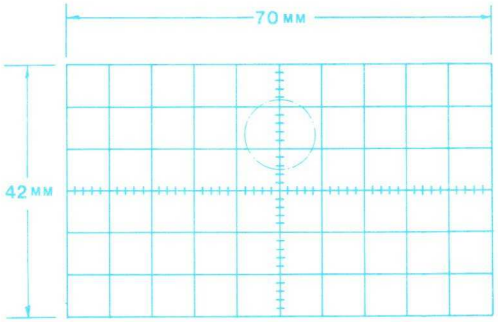


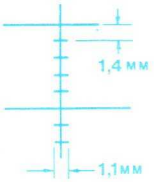


WIDTH OF ALL LINES 0,2 MM

ENLARGED DETAIL OF PART MARKED

Graticules G6 — Black
G7 — White





WIDTH OF ALL LINES 0.2 MM

ENLARGED DETAIL OF PART MARKED

M-OV Cathode Ray Tube Phosphors

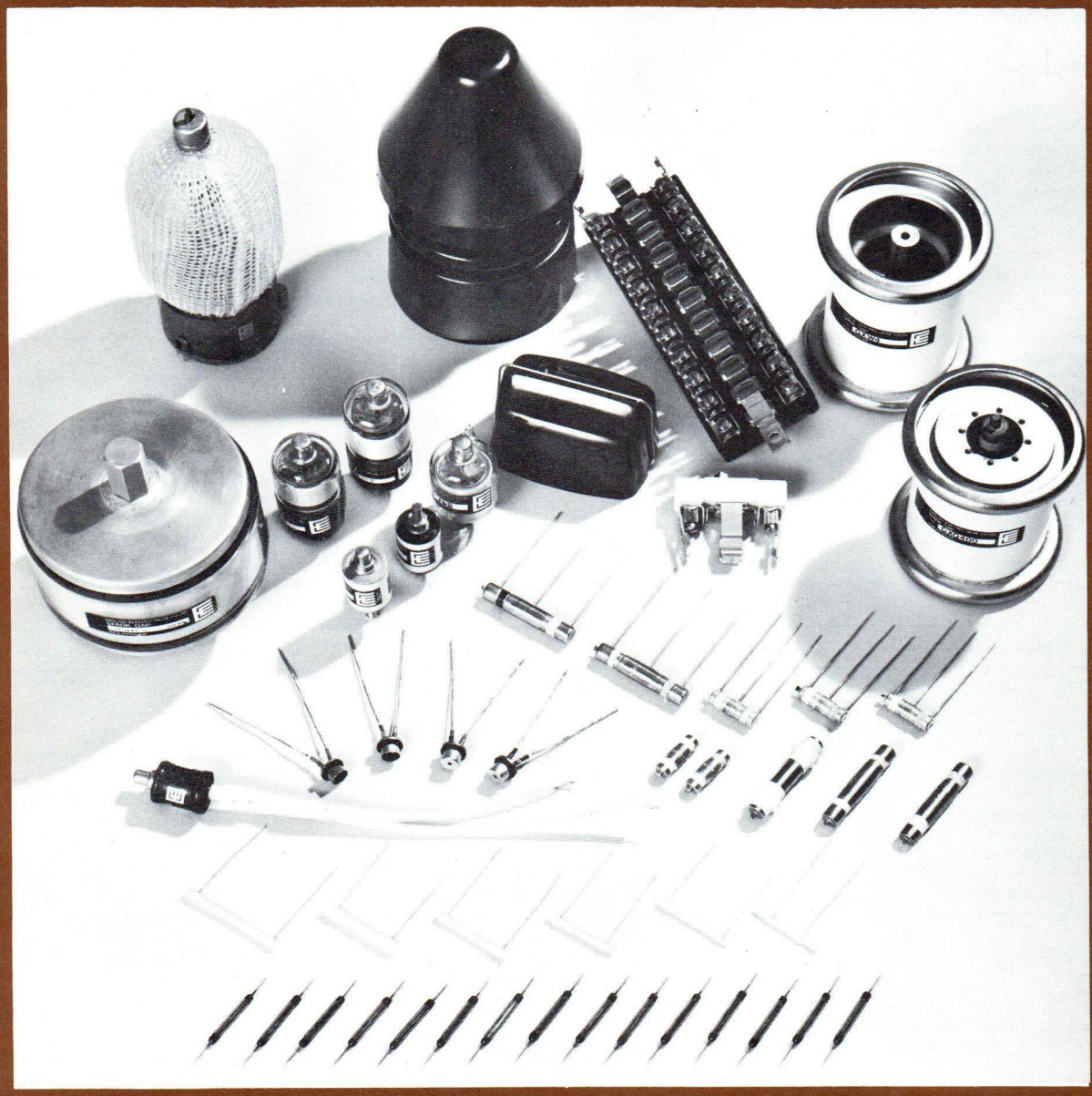
GEC	EEV	EIA	European	Old GEC	Old European	Fluorescence	Phosphorescence (Afterglow)	Persistence (approx)	Typical use
01	G	P1	GJ	B	G	Yellowish-green	Yellowish-green	Medium	Projection and oscilloscope
08	P	P11	BE	E	B	Blue	Blue	Medium-short	Photographic recording
15	A	P24	GE	U	K	Green	Green	Short	Flying spot scanners
18	W	P4	W	G	W	White	White	Medium-short	Television monitors
19	Z	P26	LC	T	F	Orange†	Orange	Very long	Long range radar
22	C	P16	BA	–	C	Violet and U.V.	Violet and U.V.	Very short	Flying spot scanners
23	Y	P33	LD	J	L	Orange†	Orange	Very long	Medium and short range radar
24	H	P31	GH	–	H	Green	Green	Medium-short	General purpose oscilloscopes
25	N	P2	GL	–	N	Yellowish-green	Yellowish-green	Medium	Wide speed range oscilloscopes
27	S	–	LB	–	E	Orange†	Orange	Long	Medium and short range radar
28‡	–	–	–	–	–	Orange	Orange	Long	Medium range radar
29	E	P39	GR	–	–	Green	Green	Long	Medium and short range radar. Anti-flicker displays
30	B	–	–	–	U	Blue	Blue	Medium-short	Projection
46	X	P7	GM	M	P	White	Yellowish-green	Med. short/ long*	Radar and slow speed oscilloscopes
		P22 (R)	–	–	–	Red	Red	Medium-short	Projection
+50	The addition of this number to the GEC code indicates an aluminized screen, i.e. GEC phosphor No. 25 with aluminized screen becomes 75.								

‡ Reduced burn type phosphor

* White: Medium-short
Yellowish-green: Long

† This screen is readily damaged by slow-moving traces of high brightness, and should not be used with a stationary trace. It is normally used for radar PPI display.

SPECIAL PRODUCTS



M-OV Barretters

Twin filament resistance lamps primarily intended for use in telephone exchanges for feeding transmitter current to subscribers' lines.

Voltage each filament (V)	Type	Voltage between filaments (V)	Nominal filament current (mA)	Bulb temperature (°C)
25	**RL2G (P.O. No. 1)**	250	95	250
25	**RL2GA (P.O. No. 1S)*■**	250	95	250
86	**RL16 (P.O. No. 16)**	250	120	250

*The RL2GA is a selected version of the RL2G with close control of the current/voltage characteristics in the region between 5 and 10V (filaments in series).

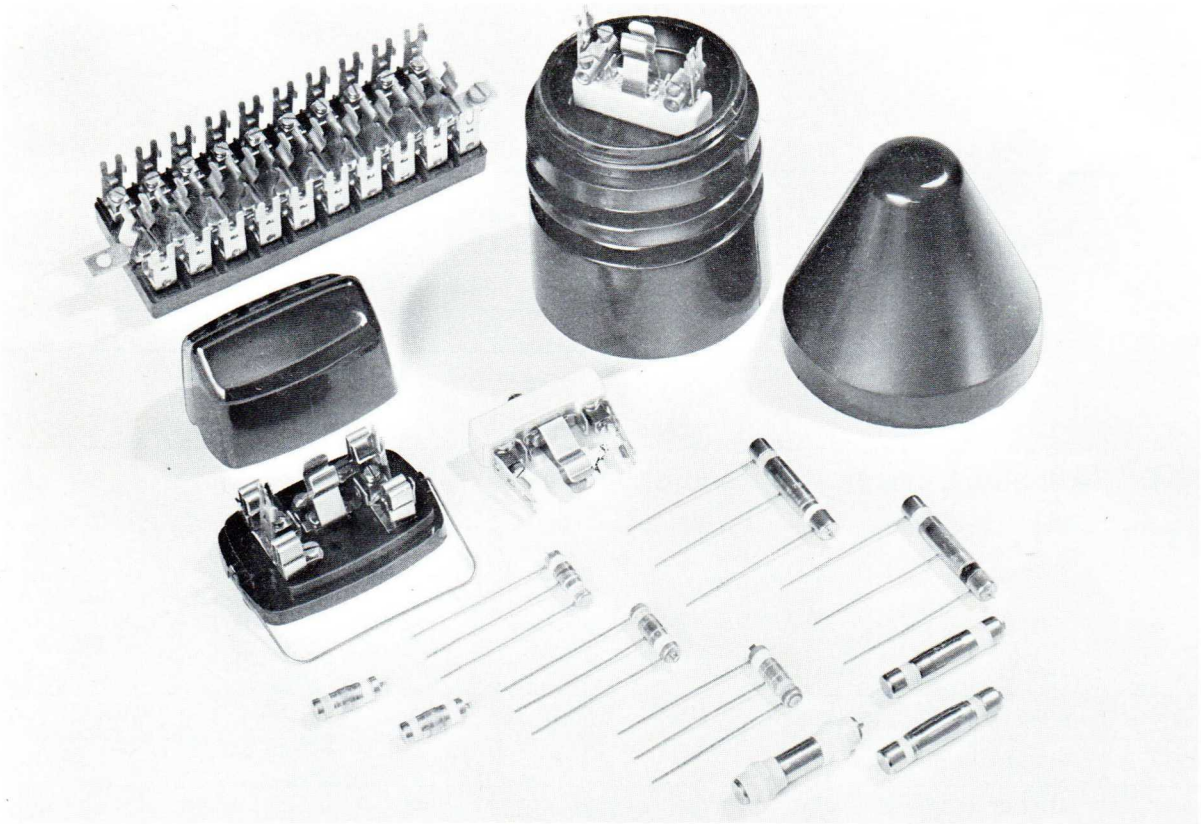
M-OV Surge Arresters and Protectors

Description	Type	D.C. striking voltage (V)	D.C. glow voltage (V)	Colour marking
2-electrode moulded air gap	**13B■**	600–900	–	Black
2-electrode moulded air gap	**13D■**	1100–1700	–	Blue
2-electrode moulded air gap	**13E■**	1050–1350	–	Blue
Standard 2-electrode metal-ceramic envelope	**28**	240–360	155–215	Yellow
Wire ended version of Type 28	**29**			
Miniature 2-electrode metal-ceramic envelope	**18**	285–395	145–195	Yellow
Type 18 in a plastic sleeve with eyelet protecting the pinch-off seal	**101**			
Wire ended version of Type 18	**105**			
Standard 3-electrode metal-ceramic envelope	**16A**	150–350	150–260	Black
Standard 3-electrode metal-ceramic envelope	**16B**	300–500	155–215	Yellow
Standard 3-electrode metal-ceramic envelope	**16C**	500–900	165–225	Red
Standard 3-electrode metal-ceramic envelope	**16E**	800–1400	165–235	Purple
Fail-safe version of Type 16A	**160A**			
Fail-safe version of Type 16B	**160B**			
Fail-safe version of Type 16C	**160C**			
Fail-safe version of Type 16E	**160E**			
High power 3-electrode metal-ceramic envelope	**26A**	150–350	150–260	Black
High power 3-electrode metal-ceramic envelope	**26B**	300–500	155–215	Yellow
High power 3-electrode metal-ceramic envelope	**26C**	500–900	165–225	Red
Wire ended version of Type 26	**27**			
Fail-safe version of Type 26A	**260A**			
Fail-safe version of Type 26B	**260B**			
Fail-safe version of Type 26C	**260C**			
Miniature 3-electrode metal-ceramic envelope	**21A**	150–350	150–260	Black
Miniature 3-electrode metal-ceramic envelope	**21B**	300–500	155–215	Yellow
Miniature 3-electrode metal-ceramic envelope	**21C**	500–900	165–225	Red
Wire ended version of Type 21	**22**			

■ Made to special order only.

M-OV Arrester Mounts

Type	Description
53	A unit for surge arrester type 16 incorporating two gaps. The base is of glazed ceramic providing high insulation resistance and dimensional stability in humid conditions.
54	A composite mounting for surge arrester type 16 incorporating mount type 53 with connections for type 34 fuses in twin protection.
55	An enclosed composite mounting for surge arrester type 16 and two type 34 fuses, primarily designed for subscribers' instrument protection.
56A	A strip mounting to accommodate 10 type 53, 54 or 59 arrester mounts.
56B	Similar to 56A but with accommodation for 20 type 53, 54 or 59 arrester mounts.
57	A pole mounted weatherproofed enclosure incorporating a type 53 arrester mount. The earth connection is connected to the mounting spindle. The unit may be used either as a terminal or a 'T' junction.
59■	A unit designed for two arresters type 13 and two fuses type 34; designed for strip mounting on mounts 56A or 56B.
60■	Open-sided ceramic sleeve between two end caps to take a surge arrester type 16. This is a replacement unit for special applications such as those which originally used the earlier types Drg. 36 and Drg. 36/2.
61■	A unit for surge arrester type 16. Similar to the type 53 but with provision for rear mounting.
63	A simple slide-in mount incorporating a surge arrester type 16. Suitable for mounting in banks on distribution frames.
66■	A mount suitable for the type 21 arrester. The mounting forms part of an existing range of interlocking parts which can be built up into terminal banks sized to suit the end user.
67■	A block of 10 mounts similar to the 53 but without spark gap. The block is designed to be split into two sets of 5 if required.



A group of Arresters and Mounts

M-OV Fuses

Standard porcelain body fuse with knife type contacts for use in mount types 54, 55 and 59. Available as type 34A 2.5 amp, 34B 0.5 amp, 34C 1.0 amp, 34D■ 1.5 amp.

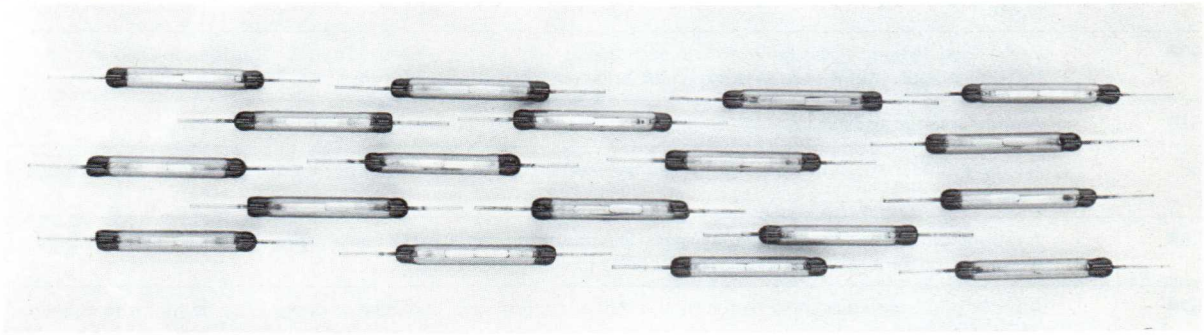
Type 2B fuse dummies are available. These are interchangeable solid connectors to replace type 34 fuse.

M-OV Switching Devices — Dry Reed Capsules

A range of high quality contacts with various sensitivities, suitable for fast low level telephone exchange and industrial switching applications. Single contact, normally open.

Operate sensitivity min (A turns)	Type	Switched power max (W)	Switched voltage max (V)	Switched current max (mA)	Contact resistance max (mΩ)	Operate time max (ms)	Length overall max (mm)	Diameter max (mm)
40	**RCH**	5.0	75	100	150	–	48	4
58	**RC1**	5.0	75	100	150	2.0	46.1	4
70	**RCZ**	5.0	75	100	150	–	48	4
100	**RCY**	5.0	75	100	150	–	48	4
–	**RCX**	5.0	75	100	150	–	48	4

Dry Reed Capsules



M-OV Switching Devices — Solenoids

Coil voltage nominal (V)	Type	Coil voltage max (V)	Coil temperature max (°C)	Resistance nominal (Ω)	Amp turns at nominal voltage	Voltage to operate RC1 min (V)
1.5	**IS1.5V■**	3.0	70	28	91 ± 4.5	1.1
6.0	**IS6V■**	12	70	500	84 ± 8.4	4.6
12	**IS12V■**	24	70	1750	89 ± 8.9	8.7
24	**IS24V■**	48	70	4050	113 ± 11.3	13.7

M-OV Switching Devices — Solenoids

Flat 4 coil assemblies for dry reed capsules. Performance when fitted with 2 or 4 reeds.

Coil voltage nominal (V)	Type	Turns*	Nominal resistance at 20°C*	Minimum operate voltage at 55°C (V)	Minimum hold voltage at 55°C (V)	Maximum (non operate) voltage at 5°C (V)	Maximum release voltage at 5°C (V)
6	**210-0402-001■**	2440	156	5.2	3.5	0.96	0.4
12	**210-0404-001■**	4750	635	10.8	7.3	2.0	0.84
24	**210-0405-001■**	9140	2340	20.4	13.9	3.7	1.6
36	**210-0406-001■**	14000	6000	34.3	23.8	6.5	2.6

The above type numbers are for coil assemblies without reeds

Temperatures quoted above are local component ambient.

Maximum power dissipation for continuous operation at 55°C is 0.8 watt

■ Made to special order only.

Limited circuit ampere turns

Operate	65
Non-operate	18
Hold	44
Release	7.5

* Standard resistance tolerance ± 10%; turns are wound exact.

M-OV Surge Protection Devices

Anode voltage (kV)	Type	Peak anode current (A)	Trigger voltage (V)	Anode/ cathode breakdown time (μs)	Total discharge per operation (Coulombs)	Trigger duration (μs)
6.0	**SD6000■**	2000	3500	0.5	0.5	1.0
15	**SD15000**	2000	3500	1.5	5.0	1.0
15	**SD15000A■**	2000	§	1.5	5.0	–

§ The SD15000A is a self-triggered diode. It fires if the rate of rise of anode voltage exceeds 3kV/μs but does not fire if the rate of rise of anode voltage is less than 30kV/ms.

M-OV Geiger Müller Tubes — Organically Quenched

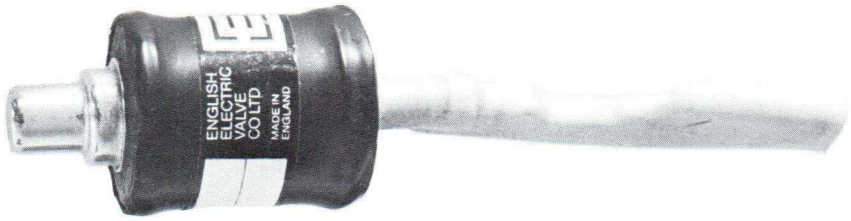
GEC organically quenched tubes use ethyl formate as the quenching agent, which has many advantages over ethyl alcohol. Tubes using ethyl formate have better plateau characteristics, longer life, better temperature coefficient and a lower minimum operating temperature.

Plateau length average (V)	Type★	Plateau slope average (%)	Operating voltage limits (V)	Count life	Shielded background counts/ min.	Signal output (V)♦	Dead time (μs)	Recovery time (μs)
200	**GM4LB■**	0.08	1200–1400	–	down to 0.4	$\frac{280}{140 + C}$	–	–
250	**GM4 (CV2138)■**	0.05	1250–1450	6×10^8	7–15	$\frac{220}{100 + C}$	100	250
250	**XA1**	0.05	1400–1600	5×10^8	30	5	250	650
250	**2B7■**	0.05	1400–1600	4×10^8	30–46	$\frac{340}{120 + C}$	220	700
300	**EHM2S (CV2139)■**	0.04	1400–1600	6×10^8	5–13	$\frac{160}{100 + C}$	150	380
300	**2B2■**	0.04	1400–1600	4×10^8	25–45	$\frac{120}{100 + C}$	150	750

EEV EBW Devices

EEV produce Detonators, Squibbs and Triggered Vacuum Gaps for exploding bridge wire (EBW) circuits. These devices are produced to exacting safety standards.

Triggered Vacuum Gap



♦ C is the total capacitance across the tube, in pF.

★ The operating temperature range of all types is –20 to +50°C.
PLANCHETS can be supplied; 15mm, 25mm, flat or dished.

EEV Spark Gaps

EEV manufactures a comprehensive range of spark gaps for ignitor applications, d.c. protection, heavy current applications and for the protection of pulsed circuits. Each of the styles listed below comprises a series of spark gaps with breakdown voltages covering the specified range. Customers' enquiries for spark gaps to suit individual requirements are invited.

Series	Number of electrodes	Range of breakdown voltage (kV)	Cumulative charge rating (coulomb)	Connections/ mounting
GXA	2	8–16 (pulsed d.c. over a range 1000–1200p.p.s.)	100	CT2 end cap and octal base
GXB	2	8–16 (pulsed d.c. over a range 1000–1200p.p.s.)	100	CT2 end caps
GXC	2	0.5–30 (d.c.)	100	Flexible leads
GXD	2	0.5–25 (d.c.)	75	CT1 end caps
GXE	2	0.5–3.0 (d.c.)	50	Flexible leads
GXF	2	0.5–15 (d.c.)	20000	Bolt on
GXK	2	0.4–12 (d.c.)	50	CT1 end caps
GXL	3	0.4–12 (d.c.)	50	CT1 end caps
GXN	2	0.4–12 (d.c.)	400	CT1 end caps
GXO	3	0.4–12 (d.c.)	400	CT1 end caps
GXP	2	0.4–12 (d.c.)	50	Stud mounted
GXQ	3	0.4–40 (d.c.)	1000	Screw mounted
GXR	2	0.4–12 (d.c.)	400	Stud mounted
GXS	2	0.5–30 (d.c.)	100	Flexible leads
GXU	2	0.4–12 (d.c.)	400	CT1 end caps
GXV	2	0.4–12 (d.c.)	400	Stud mounted
GXW	2	0.4–30 (d.c.)	1000	Screw mounted
GXX	2	16–20 (d.c.)	75	Stud mounted

EEV Trigatrons

Peak output power (kW)	Type	Pulse repetition rate max (p.p.s.)	Pulse duration max (μs)	Hold-off voltage max (kV)	Trigger voltage min (kV)	Base
160	**24B1 (CV6008)** **24B9 (CV6173)**	3000	1.0	10.5	5.0	CL3

EEV Ozotrons — Halogen Sensitive Elements

The ozotron will detect minute quantities of halogen or halogen compound gases in the atmosphere.

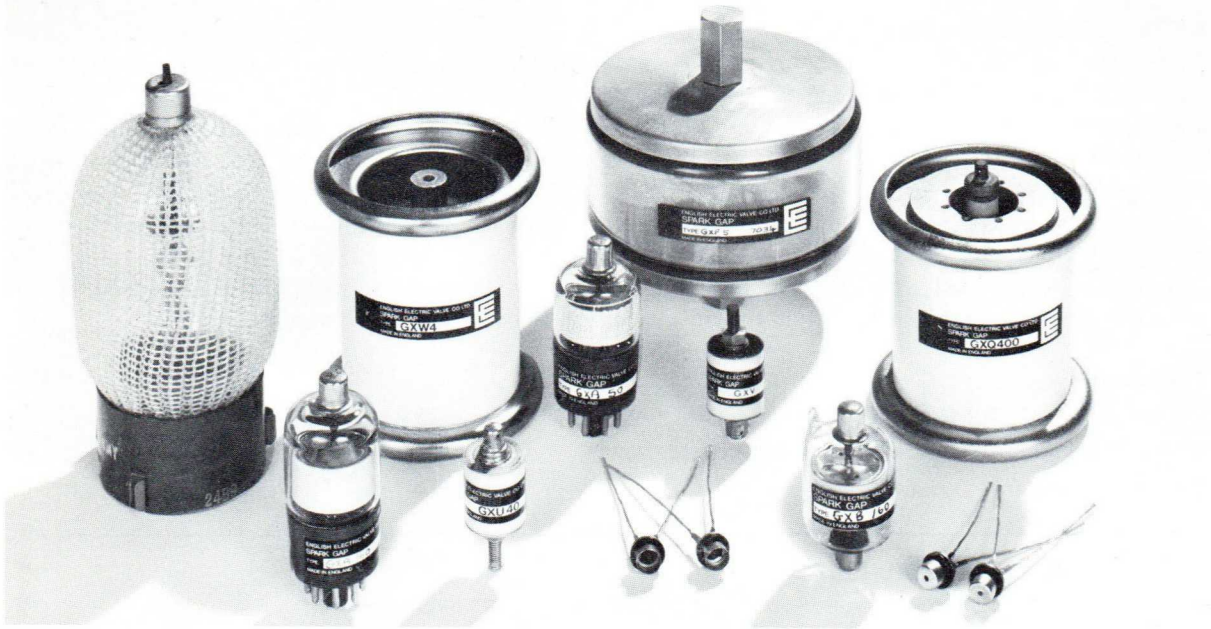
Three types of ozotron are available. Type H has a glass envelope; types G and J have ceramic envelopes and are demountable so that the inner electrodes can be cleaned.

The three types are capable of detecting halogen concentrations of 1 part in 1 500 000. A leakage of Arcton (dichlorodifluoromethane) at the rate of 1.5 milligrams per day (0.02 ounce per year) can be located.

EEV Methane Detector Elements

The methane detectors listed below consist of two elements which are used as two arms of a bridge circuit. They are designed to detect methane in air in concentrations from 0.1% upwards. There is no interference from water vapour or carbon dioxide. The minimum sensitivities specified apply when the recommended circuit and mounting are used.

Type	Minimum sensitivity (mV/% methane)	Linearity (% methane)	Response time (sec)★	Maximum methane concentration (%)	Bridge supply (V)	Bridge power consumption (W)
VQ1	20	up to 3	2	10	2.0 ± 0.1	0.75
VQ2	15	up to 3	2	5	2.0 ± 0.1	0.48
VQ3	20	up to 3	2	6	2.5 ± 0.1	1.1
VQ4◇	20	up to 3	2	10	2.0 ± 0.1	0.75
VQ6	A pair of inactive elements for use in detecting up to 100% concentration of gas.					



A group of Spark Gaps with pairs of Methane Detector Elements in the foreground

EEV Nernst Filaments — Infra Red Sources

Type	Operating current minimum ($A_{r.m.s.}$)†	Operating current maximum ($A_{r.m.s.}$)‡	Temperature range (°C)	A.C. supply voltage♦ (V)	Voltage drop ($V_{r.m.s.}$)
NFT1	0.3	0.65	1350–1750	200–250	90–110
NFT2	0.5	1.3	1350–1700	200–250	70–90
NFT3	0.4	1.2	1350–1720	200–250	70–95
NFT4	0.5	1.5	1300–1700	200–250	95–130
NFT5	0.2	1.2	850–1330	200–250	70–100
NFT6	0.3	0.8	1300–1700	200–250	70–90
NFT7	0.3	1.4	1050–1550	200–250	50–70
NFT8	0.3	1.4	1075–1600	200–250	50–80
NFT9	0.3	0.8	975–1700	200–250	60–80
NFT10	0.3	1.2	1125–1625	200–250	60–80

† Minimum value for stable operation.
◇ Two elements supplied on a single mount.
‡ For maximum operating temperature.
♦ With suitable series impedance.
★ Time to register 1¼% in a 2½% concentration.

INDEX D'EQUIVALENCE DES TUBES

Cet index comprend les tubes de divers fabricants et pour le remplacement desquels il existe des tubes EEV/M-OV. Les numéros des types CV et NATO sont également inclus.

Les types mentionnés dans la colonne 'EEV/M-OV replacement' peuvent être utilisés directement pour le remplacement de ceux mentionnés sous le titre 'type to be replaced' sauf lorsque marqué d'un astérisque * qui indique qu'il peut être nécessaire de procéder à une légère modification en raison d'une différence mineure mécanique ou électrique. Pour plus de détails de ces différences s'adresser à EEV.

Lorsque le symbole † est porté dans la colonne 'page number' les caractéristiques abrégées de ce tube ne sont pas données dans cet index mais nous répondrons à toute demande de renseignements.

Code des Couleurs

Pour toutes les indications nous utilisons le code de couleur suivant:—

Marron: produits fabriqués par English Electric Valve Co Ltd

Bleu: produits fabriqués par M-O Valve Co Ltd

LISTE GLEICHWERTIGER RÖHREN

Diese Liste zeigt Röhren verschiedener Hersteller, welche durch Röhren von EEV/M-OV ersetzt werden können. CV und NATO-Typennummern werden ebenfalls angeführt.

Die in der Spalte 'EEV/M-OV replacement' angegebenen Typen können direkt als gleichwertiger Ersatz anstelle der Typen in der Rubrik 'type to be replaced' verwendet werden. Bei den mit einem Sternchen * gekennzeichneten Typen können jedoch unbedeutende Abänderungen auf Grund von geringfügigen mechanischen oder elektrischen Unterschieden erforderlich sein. Näheres über diese Unterschiede ist bei EEV erhältlich.

Das Symbol † in der Spalte 'page number' bedeutet, daß für die entsprechende Röhre in diesem Katalog keine Kurzdaten angeführt sind. Anfragen zu diesen Röhren sind uns jedoch willkommen.

Farbkennzeichnung

Die folgende Farbkennzeichnung wird für die Daten verwendet:

Braun: Produkt der English Electric Valve Co Ltd

Blau: Produkt der M-O Valve Co Ltd

INDICE DE INTERCAMBIABILIDAD

En este Indice se dá una relación de lámparas electrónicas de diversas marcas para las que se pueden utilizar como repuesto las lámparas EEV/M-OV. Asimismo, se incluyen los números CV y NATO.

Los tipos que figuran en la columna 'EEV/M-OV replacement' pueden utilizarse directamente como repuestos de los detallados bajo el epígrafe 'type to be replaced' excepto cuando vayan acompañados de un asterisco *, el cual indica que pueden ser necesarias pequeñas modificaciones debido a ligeras diferencias de orden mecánico o eléctrico. Se puede obtener detalles de estas variaciones de EEV.

El símbolo † en la columna 'page number' significa que no se facilita en este Catálogo un resumen informativo sobre la lámpara, pero se suministrarán con el mayor gusto los datos procedentes, a solicitud del interesado.

Clave de Colores

En todo lugar se ha utilizado la siguiente clave de colores:—

Marrón indica fabricado por la English Electric Valve Co Ltd

Azul indica fabricado por The M-O Valve Co Ltd

INDICE DEGLI EQUIVALENTI

Il presente indice elenca le valvole costruite da altre società che possono venire sostituite dalle valvole EEV/M-OV. La distinta elenca parimenti i numeri CV e NATO.

I modelli figuranti nella colonna 'EEV/M-OV replacement' possono venir usati a sostituzione diretta dei modelli elencati sotto la dicitura 'type to be replaced', eccettuato il caso in cui figuri l'asteristico *; in detto caso, occorre apportare lievi modifiche per compensare leggere diversità meccaniche o elettriche. Per ottenere particolari di queste differenze rivolgersi a EEV.

Dove appare il simbolo † nella colonna 'page number', non vengono forniti i dati abbreviati inerenti la valvola; in tal caso, comunque, il cliente è pregato di interpellarci.

Colore Codice

Nel presente opuscolo, si usa il seguente codice:—

il marrone indica che la valvola è costruita dalla English Electric Valve Co Ltd

il blu indica che la valvola è costruita dalla M-O Valve Co Ltd

EQUIVALENTS INDEX

This index lists tubes of various manufacturers for which EEV/M-OV tubes may be used as replacements. CV and NATO type numbers are also included.

The types listed in the column 'EEV/M-OV replacement' may be used as direct replacements for those under the heading 'type to be replaced' except where indicated by an asterisk * which means that minor modifications may be necessary because of slight mechanical or electrical differences. Details of these differences are available from English Electric Valve Co Ltd

Where the symbol † appears in the column 'page number', abridged data for the tube are not given in this catalogue but enquiries are welcomed.

Colour Code

Throughout the data the following colour code is used:—

Brown indicates manufacture by English Electric Valve Co Ltd

Blue indicates manufacture by The M-O Valve Co Ltd

Type to be replaced	EEV/M-OV replacement	Page no
0A2	0A2	23
0A2WA	0A2WA	23
0B2	0B2	23
0B2WA	0B2WA	23
0C2	0C2	23
0G3	QS1209/5651	23
1B27	BS700	†
1B35A	BS412	37
1B58	BS58	33
1B59	1B59	75
1B63A	BS914	35
1G32P*	FX2505	8
1G35P	FX2505	8
1G45P	FX227	8
1K24	3B24W	5
1M70A	BM25L	46
2B2	2B2	87
2B7	2B7	87
2B52*	C1134	16
2B94*	C178A/5894	16
2G/402A	GXU1	6
2G/472B	GXU2	6
2G/473C	GXU3	6
2G22P	8503	8
2G57	5557	7
2H28	GXU1	6
2H66	GU12	6
2J30 to 2J34	2J30 to 2J34	†
2J42	2J42	50
2J42A	M513B	50
2J42H	2J42H	50
2J55	2J55	51
2J70A	2J70A	47
2J70B	M5063/2J70B	47
2T24	3C24	12
2V/400A	GU12	6
2V/474C	AH238	6
2V/490C*	AH221	6
2V/500C	AH221	6
2XM600A	GU12	6
3B21P*	C1150/1	16
3B24W	3B24W	5
3B28	GXU1	6
3B29*	3B24W	5
3C/800E	B1153	12
3C24	3C24	12
3C45	FX227	8
3C45/6130	FX227	8
3C45/PL345	FX227	8
3C45A	FX227	8
3C45W*	FX227	8
3CC115S	3CC115S	60
3CC120S	3CC120S	60
3CC210S	3CC210S	60
3CC310S	3CC310S	60
3CC1100	3CC1100	60
3CC1200	3CC1200	60
3CC2100	3CC2100	60
3CC2200	3CC2200	60
3CC3100	3CC3100	60
3CC3101	3CC3101	60
3CC4100	3CC4100	60
3F10TA*	BW179	14
3F10TR*	BR179	13
3F15TR*	BR161	13
3F21P*	C1150/1	16
3F60P*	C1149/1	16
3G15*	AFX203	7
3G49P	FX2519A/5949A	8
3G125T	BY1144	15
3J/121E	ACT9	13
3J/187E*	BR1196	13
3J/192E*	BR1165	13
3J/280E*	BR1183	13
3JC/187E*	BR1196	13
3K3000LQ	3K3000LQ	44
3K50,000LF	3K50,000LF	44
3KM3000LA	3KM3000LA	44
3L2T*	BR1160	13
3L5T*	BR1162	13
3R/225E	BW1513J2	14
3R/265S1	BW1121J1	14
3R/265S2	BW1121J2	14
3V/340B	BT19	7
3V/390A	5559	7
3V/390B*	5559	7
3V/490A*	BT17	7
3V/500A	BT129	7
3V5T*	BW1162	14
3Z/340G	BY1144L	15
4-125*	C1108	16
4-125A*	C1108	16
4-250*	C1112	16
4-250A*	C1112	16
4-250A/5D22*	C1112	16
4-400A*	C1136	16
4B/550E*	C1148	16
4B/551B	C1148	16
4B/551E*	C1166	16
4B/602E	C1149/1	16
4B/603E	C1150/1	16
4B32	GXU2	6
4C35	FX2505	8
4C35/PL435	FX2505	8
4C35A	FX2505	8
4CV75,000A	CY1170J	18
4CW10,000A	4CW10,000A	18
4CW25,000A	4CW25,000A	18
4CX250B	4CX250B	17
4CX1000A	4CX1000A	17
4CX1500B	4CX1500B	17
4CX5000A	4CX5000A	17
4CX10,000D	4CX10,000D	17
4CX15,000A	4CX15,000A	17
4CX35,000C	4CX35,000C	17
4D21*	C1108	16
4D32	4D32	16
4F15R	4CX250B	17
4F21*	C1108	16
4G48P*	CX1140	8
4H/135M	4CX250B	17
4H/160M	4CX250B	17
4H32	GXU2	6
4H73*	AH2511	6
4H88A*	GXU2	6
4HC/160M	4CX250B	17
4J31	4J31	48
4J32	4J32	48
4J33	4J33	48
4J34	4J34	48
4J35	4J35	48
4J43	4J43	48
4J44	4J44	48
4J50	4J50A	52
4J50A	4J50A	52
4J52A	4J52A	52
4J53	4J53	48
4JC/201E	6166A	17
4JC/201S*	CR192A	17
4KM100LA*	K376	45
4KM100LF*	K377	45
4KM50,000LA3*	K365	45
4KM50,000LQ	4KM50,000LQ	44
4KM50,000LR	4KM50,000LR	44
4MA7	M5057	53
4PR60B*	C1149/1	16
4PR60C*	C1149/1	16
4S016T*	C1108	16
4S040T*	C1136	16
4X150A	4CX250B	17
4X250B	4CX250B	17
5A/185K	D3a	20
5C21*	BT127	7
5C22	8503	8
5C22/HT415	8503	8
5C22/PL522	8503	8
5CC1151	5CC1151	61
5CC1152	5CC1152	61
5D22*	C1112	16
5D22/4-250A*	C1112	16
5F20RA	4CX250B	17
5F22*	C1112	16
5F23A*	C1136	16
5V3828	GXU1	6
6CR4	A2521	20
6CT4	A2599	20
6D4	6D4	7
6F66R*	6166A	17
	CR192A	17
6G21*	BT127	7
6G45	BT127	7
6G58	BT127	7
6T40	B1152	12
6T50	B1153	12

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
7ABP7A	7ABP7A	78
7ABP33A	7ABP33A	78
7C23	BR1165	13
7H57*	AH205/857B	6
7T25R*	BR1160	13
8F10R	4CX5000A	17
8F11R	4CX10000D	17
8F66R*	CR192A	17
8F66RA	6166A	17
8MA16	M5053	53
8MA20	M5055	53
8MA23	M5054	53
8MA26	M5059	53
8NT5	BS386	41
8T39*	BY1122	15
	BY1124	15
8T61*	BW189	14
8T71R*	BR189	13
9/03LB	2273D	78
9C25*	BR1102	13
9M40	M513B	50
9M61	M5108	50
9M72	M513B	50
9M80	M5115	50
9RP33	2273D	78
11C1	A2293	20
11D12	6080	20
11E15	C1134	16
11E16	C178A/5894	16
11TA31*	0A2	23
12/03HB	3073Q	78
12/04HM	3069M	78
12/44NM	MF31-55	78
12E1	12E1	20
12E12*	C1150/1	16
12E13	KT88	20
13B Arrester	13B Arrester	84
13D Arrester	13D Arrester	84
13E Arrester	13E Arrester	84
15D12	B1153	12
16A Arrester	16A Arrester	84
16B Arrester	16B Arrester	84
16C Arrester	16C Arrester	84
16E Arrester	16E Arrester	84
17	5557	7
18 Arrester	18 Arrester	84
21A Arrester	21A Arrester	84
21B Arrester	21B Arrester	84
21C Arrester	21C Arrester	84
21N13	5559	7
22 Arrester	22 Arrester	84
22M1	1B59	76
24B1	24B1	88
24B9	24B9	88
25T*	3C24	12
25TG*	3C24	12
26A Arrester	26A Arrester	84
26B Arrester	26B Arrester	84

Type to be replaced	EEV/M-OV replacement	Page no
26C Arrester	26C Arrester	84
27 Arrester	27 Arrester	84
28 Arrester	28 Arrester	84
29 Arrester	29 Arrester	84
30MD1	BS502	42
31E12/T7	T957Z	78
31E12/T15	T957Y	78
31E13/T7	3069M	78
34 Fuses	34 Fuses	85
0041-15-300-0014	BS810	35
0041-24-311-3305	3C24	12
43QV26*	8541A	66
43QV26/P*	P849D	66
43QV26/R*	8541	66
43QV26/T*	8541	66
44QV26*	8051	68
52QV26*	8541A	66
52QV26/R*	P842X	66
53 Mount	53 Mount	85
54 Mount	54 Mount	85
55 Mount	55 Mount	85
55B/200A	C1134	16
55B/400A	C178A/5894	16
55QU26	8541	66
56A Mount	56A Mount	85
56B Mount	56B Mount	85
57	5559	7
57 Mount	57 Mount	85
59 Mount	59 Mount	85
59-60/04/001	SC7 Series	24
59-60/04/003	SC6 Series	24
59-60/05/003	TWJ30	54
59-60/08/001	BS834	32
59-60/08/005	BS800	33
59-60/08/006	BS730	32
59-60/08/011	BS968	36
59-60/08/012	BS974	36
59-60/08/024	BS960	37
59-60/08/014	BS912	32
59-60/90/001	BS502	42
59-60/90/006	BS716	32
59-60/90/007	BM1038	52
59-60/90/008	BM1039	52
59-60/90/011	K3007	43
59-60/90/013	BS510	42
59-60/90/024	BS104	33
59-60/90/027	BS724 Series	32
59-60/90/031	SC6 Series	24
59-60/90/053	BS710	32
59-60/90/062	YD1400	20
60 Mount	60 Mount	85
61 Mount	61 Mount	85
63 Mount	63 Mount	85
63QV26*	8541A	66
63QV26/P*	8541	66
64QV26*	8051	68
66 Mount	66 Mount	85
67 Mount	67 Mount	85

Type to be replaced	EEV/M-OV replacement	Page no
75B1	QS75/20	23
75C1	75C1	23
75PC11	P874	70
85A2	QS1209/5651	23
90C1	QS1215	23
95A1	QS95/10	23
100MD1	BS510	42
100MD4	BS510	42
101 Arrester	101 Arrester	84
105 Arrester	105 Arrester	84
108C1	0B2	23
150B2	QS1200	23
150B3	QS150/15	23
150C2	0A2	23
150C4	150C4	23
160A Arrester	160A Arrester	84
160B Arrester	160B Arrester	84
160C Arrester	160C Arrester	84
160E Arrester	160E Arrester	84
210-0069*	BT19	7
210-0402-001	210-0402-001	86
210-0404-001	210-0404-001	86
210-0405-001	210-0405-001	86
210-0406-001	210-0406-001	86
238B	BK46/5555	4
249A/B	GU12	6
260A Arrester	260A Arrester	84
260B Arrester	260B Arrester	84
260C Arrester	260C Arrester	84
272	5557	7
287A*	5557	7
309	5557	7
357B	GU12	6
513QM8	P874	70
	P875	70
515QM8	7389C	70
517	5557	7
575A*	AH2511	6
631*	5559	7
	BT5	7
632B*	5559	7
	BT5	7
651	BK484/5552A	4
652	BK448/5551A	4
655	BK486/5553B	4
656	BK484/5552A	4
657	BK448/5551A	4
658	BK486/5553B	4
673*	AH2511	6
676*	BT17	7
681	BK66/5550	4
715	5557	7
715C*	C1150/1	16
724E	724E	80
751J	751J	79
769H	769H	79
857B*	AH205/857B	6
866	GU12	6

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
866A	GU12	6
966	GU12	6
967	5557	7
974W	974W	80
996W	996W	80
1074H	1074H	80
1163	68506	6
1255FIM*	7038	65
1255NOR*	7038	65
1257	5559	7
1290-99-618-9155	BS806B	38
1295*	5559	7
	BT5	7
1324A/2	1324A/2	80
1324M	1324M	80
1324Y	1324Y	80
1324Z	1324Z	80
1325M	1325M	80
1346M	1346M	80
1346Y	1346Y	80
1346Z	1346Z	80
1358X	1358X	79
1374Q	1374Q	80
1424A	1424A	80
1424A/G1	1424A/G1	80
1424J	1424J	80
1424J/G4	1424J/G4	80
1430-99-624-0673	GXE30	88
1446A/G1	1446A/G1	80
1446J/G4	1446J/G4	80
1468A	1468A	80
1474B	1474B	80
1478E	1478E	78
1496B	1496B	80
1578A	1578A	78
1578B	1578B	78
1774A	1774A	79
1774B	1774B	79
1824A	1824A	80
1846A	1846A	80
1907	FX2519A/5949A	8
2168A	2168A	78
2174C	2174C	80
2196C	2196C	80
2196D	2196D	80
2255*	8626	66
2255AMR*	P849D	66
2255BAE*	P849D	66
2255ENT*	P849D	66
2255FIM*	P844	66
2255IND	P8031	66
2255IND*	8541	66
2255NOR*	8541A	66
2255RF	P8031N	66
2255ROE*	P842X	66
2255SF	P8031Z	66
2260AMR	P849D	66
2260BAE	P849D	66

Type to be replaced	EEV/M-OV replacement	Page no
2260ENT	P849D	66
2260FIM	P844	66
2260IND	8541	66
2260NOR	8541A	66
2260ROE	P842X	66
2269Y	2269Y	78
2273D	2273D	78
2273P	2273D	78
2700*	8134	67
2700IND*	8134V1/4811	67
2705IND	8134V1/4811	67
2861B	4CX250B	17
3069M	3069M	78
3069Q	3069Q	78
3069R	3069R	78
3073Q	3073Q	78
3077R	3077R	78
3079R	3079R	78
3096Q	3096Q	78
3096R	3096R	78
4017	GU12	6
4049D	AH221	6
4049GD	BT129	7
4077A*	AH221	6
4169B	4169B	78
4196B	4196B	78
4212E	V1505	12
4261	5557	7
4304CB	V1505	12
4415	P875	70
4478	P826/4478	65
4493	P893/4493	67
4494	P894/4494	67
4495	P895/4495	67
4536	P858	70
4543	8541A	66
4559A	8507A	66
4588*	P8034A	66
4589	P841F	†
4591B	P8000B	64
4591G	P8000G	64
4591L	P8000L	64
4591R	P8000R	64
4592B*	P8001B	64
4592G*	P8001G	64
4592L*	P8001L	64
4592R*	P8001R	64
4810	8480V1/4810	68
4811	8134V1/4811	67
5221	GXU1	6
5528	BT127	7
5544	BT125	7
5545	BT127	7
5550	BK66/5550	4
5551	BK448/5551A	4
5551A	BK448/5551A	4
5552	BK484/5552A	4
5552A	BK484/5552A	4

Type to be replaced	EEV/M-OV replacement	Page no
5553	BK486/5553B	4
5553B	BK486/5553B	4
5554	BK504/5554	4
5555	BK46/5555	4
5557	5557	7
5559	5559	7
5586	5586	48
5586A	M5083A	48
5651*	QS1209/5651	23
5651WA	QS1212	23
5657	5657	48
5671*	BR189	13
5685*	BT127	7
5720*	5559	7
5728*	5559	7
5762A*	BR1160	13
5820 Series	P874	70
	P875	70
5822	BK5822A	4
5822A	BK5822A	4
5830*	BT69	7
5840-99-618-7987	MA311	†
5840-99-626-3141	BS856	34
5842	5842	20
5853	BS110	33
5867*	DET40	12
5877	BT125	7
5878	BT127	7
5894*	C178A/5894	16
5910-99-142-5816	UC1000A/20/150	28
5910-99-142-5817	UC450A/30/150	28
5910-99-519-0952	U500/10/40	26
5910-99-519-0953	U2000A/8/75	27
5910-99-522-3862	UFC100/30/120J	30
5910-99-525-7261	UC880/15/125	28
5910-99-527-5989	MA52	26
5910-99-580-1051	U30/15/20	26
5910-99-580-1052	U50/15/30	26
5910-99-580-1053	U80/15/40	26
5910-99-618-9910	U750/15/75A	†
5910-99-630-8439	MA126	26
5910-99-924-3070	U90/15/40	26
5910-99-951-4424	UF800/3/50J	29
5910-99-952-8811	U1000A/3/40J	27
5910-99-954-0794	UF10/15/7J	29
5910-99-954-0803	UF6/15/7	29
5910-99-957-2089	U2000/8/75J	27
5910-99-957-2090	U1000/10/75J	27
5910-99-999-9109	U1000A/3/40JA	27
5920-99-193-6431	61 Mount	85
5920-99-193-9835	16B Arrester	84
5920-99-711-7317	16C Arrester	84
5920-99-901-6279	55 Mount	85
5920-99-956-0579	16A Arrester	84
5923	BW1165	14
5924	BR1165	13
5935-99-105-7229	MA153	†
5935-99-626-1261	MA91	†

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
5935-99-626-8121	MA94	†
5935-99-633-4202	MA275	†
5935-99-955-6870	MA179	†
5948*	CX1140	8
5948A*	CX1140	8
5949	FX2519A/5949A	8
5949A	FX2519A/5949A	8
5950-99-519-8458	SMX16	57
5950-99-580-0584	SMS6	55
5956*	FX2517	8
5957*	FX2517	8
5960-00-082-4125	7262A	65
5960-00-100-7136	FX2505	8
5960-00-107-7590	2J42	50
5960-00-108-0252	GXU1	6
5960-00-108-0259	FX227	8
5960-00-108-0263	6D4	7
5960-00-114-4714	3B24W	5
5960-00-116-9924	3B24W	5
5960-00-116-9931	3C24	12
5960-00-116-9969	8503	8
5960-00-166-7648	0B2	23
5960-00-166-7692	5586	48
5960-00-166-7693	5657	48
5960-00-188-3534	BS914	35
5960-00-188-3559	BS912	32
5960-00-188-3564	0A2	23
5960-00-188-8646	BT5	7
5960-00-230-5272	4CX250B	17
5960-00-242-6051	2J55	51
5960-00-243-5018	C1136	16
5960-00-247-8748	5842	20
5960-00-248-3077	8503	8
5960-00-248-3088	FX2519A/5949A	8
5960-00-261-8680	0A2WA	23
5960-00-262-0180	6080	20
5960-00-262-0181	6080WA	20
5960-00-262-0227	4J53	48
5960-00-262-0286	QS1212	23
5960-00-262-1355	FX227	8
5960-00-262-1356	BS412	37
5960-00-262-3763	0B2WA	23
5960-00-296-5541	2J42H	50
5960-00-390-5208	8503	8
5960-00-503-4880	0A2WA	23
5960-00-504-8548	4J31	48
5960-00-542-7181	FX2519A/5949A	8
5960-00-543-1001	6080WA	20
5960-00-548-9851	8503	8
5960-00-552-8277	FX2505	8
5960-00-557-6885	0B2	23
5960-00-615-4376	4CX250B	17
5960-00-615-5529	6080	20
5960-00-617-6367	0A2WA	23
5960-00-617-8584	QS1212	23
5960-00-617-8911	K3099	45
5960-00-624-4718	0B2WA	23
5960-00-663-5968	4CX5000A	17
5960-00-669-6807	4J52A	52
5960-00-669-8515	BK66/5550	4
5960-00-669-8676	C1134	16
5960-00-681-9523	4CX250B	17
5960-00-686-8631	4D32	16
5960-00-752-5979	C1149/1	16
5960-00-754-9775	K3078/6975	43
5960-00-755-0186	4CX250B	17
5960-00-778-2341	4CX1000A	17
5960-00-800-0602	7038	65
5960-00-806-9629	4D32	16
5960-00-810-3603	4CX1000A	17
5960-00-844-8284	K3099	45
5960-00-892-0813	6080WA	20
5960-00-892-0814	QS1212	23
5960-00-892-0828	4CX250B	17
5960-00-936-7931	4CX1500B	17
5960-00-958-0083	7262A	65
59-60/04/001	SC7 Series	24
59-60/04/003	SC6 Series	24
59-60/05/003	TWJ30	54
59-60/08/001	BS834	32
59-60/08/005	BS800	33
59-60/08/006	BS730	32
59-60/08/011	BS968	36
59-60/08/012	BS974	36
59-60/08/014	BS912	32
59-60/08/024	BS960	37
5960-12-127-0721	QS1209/5651	23
5960-14-200-1412	QS1209/5651	23
5960-14-201-2293	0B2	23
5960-14-205-0742	6587	8
5960-14-206-3385	4J50A	52
5960-14-206-3386	4J52A	52
5960-14-220-4487	2J34	†
5960-14-220-4497	C1108	16
5960-14-220-4515	5586	48
5960-14-220-4517	2J30	†
5960-14-220-4523	FX227	8
5960-14-220-4526	C1112	16
5960-14-220-4783	2J32	†
5960-14-220-4784	2J31	†
5960-14-226-0204	5657	48
5960-14-256-3774	P862	†
5960-14-256-8726	K3078/6975	43
5960-14-269-8319	2J33	†
5960-15-252-9810	2J42H	50
5960-17-024-3472	QS1215	23
5960-17-032-8318	M599B	50
5960-17-033-9201	4CX5000A	17
5960-17-035-0700	8541	66
5960-17-606-4243	CX1140	8
59-60/90/001	BS502	42
59-60/90/006	BS716	32
59-60/90/007	BM1038	52
59-60/90/008	BM1039	52
59-60/90/011	K3007	43
59-60/90/013	BS510	42
59-60/90/024	BS104	33
59-60/90/027	BS724 Series	32
59-60/90/031	SC6 Series	24
59-60/90/053	BS710	32
59-60/90/062	YD1400	20
5960-99-000-0005	AH221	6
5960-99-000-0028	ACT9	13
5960-99-000-0187	U19	5
5960-99-000-0233	GXA50	88
5960-99-000-0273	DET22	22
5960-99-000-0284	QS75/20	23
5960-99-000-0286	QS95/10	23
5960-99-000-0287	QS150/15	23
5960-99-000-0294	BS710	32
5960-99-000-0295	GXA85	88
5960-99-000-0345	12E1	20
5960-99-000-0354	DET23	22
5960-99-000-0372	FX227	8
5960-99-000-0395	QS150/45	23
5960-99-000-0397	DET24	22
5960-99-000-0402	GXA80	88
5960-99-000-0403	24B9	88
5960-99-000-0422	QS108/45	23
5960-99-000-0427	C1150/1	16
5960-99-000-0429	3069M	78
5960-99-000-0434	QS75/60	23
5960-99-000-0436	ACT25	13
5960-99-000-0449	QS1209/5651	23
5960-99-000-0460	BS48	37
5960-99-000-0461	BS92	37
5960-99-000-0462	BS84	37
5960-99-000-0463	BS82	37
5960-99-000-0482	A237	5
5960-99-000-0488	GXA95	88
5960-99-000-0489	BT75	†
5960-99-000-0513	4J53	48
5960-99-000-0532	AH211A	6
5960-99-000-0789	3C24	12
5960-99-000-1075	KT66	20
5960-99-000-1128	GT1C	6
5960-99-000-1144	BT19	7
5960-99-000-1147	BT5	7
5960-99-000-1219	DA100	12
5960-99-000-1435	AH221	6
5960-99-000-1619	V1505	12
5960-99-000-1629	AH238	6
5960-99-000-1742	BK504/5554	4
5960-99-000-1743	GXA60	88
5960-99-000-1747	M505	51
5960-99-000-1787	FX2505	8
5960-99-000-1807	2J31	†
5960-99-000-1808	2J32	†
5960-99-000-1809	2J33	†
5960-99-000-1810	2J34	†
5960-99-000-1832	0A2	23
5960-99-000-1833	0B2	23
5960-99-000-1835	GXU1	6
5960-99-000-1841	BS52	35

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
5960-99-000-1859	GXA160	88
5960-99-000-1866	2J42	50
5960-99-000-1881	BS384	41
5960-99-000-1897	4J34	48
5960-99-000-1898	4J35	48
5960-99-000-1914	4J31	48
5960-99-000-1916	4J33	48
5960-99-000-1923	BS810	35
5960-99-000-1949	6D4	7
5960-99-000-1994	ACT9B	13
5960-99-000-2012	QS1209/5651	23
5960-99-000-2109	BT89	7
5960-99-000-2124	BK484/5552A	4
5960-99-000-2130	C1108	16
5960-99-000-2131	C1112	16
5960-99-000-2138	GM4	87
5960-99-000-2139	EHM2S	87
5960-99-000-2157	BS710	32
5960-99-000-2159	BR153	†
5960-99-000-2160	A207	5
5960-99-000-2161	K301	†
5960-99-000-2163	ACT28	13
5960-99-000-2164	K302	43
5960-99-000-2167	BM1041	†
5960-99-000-2179	A2134	21
5960-99-000-2181	BS104	33
5960-99-000-2186	BM1031	51
5960-99-000-2203	FX215	†
5960-99-000-2225	QS1200	23
5960-99-000-2231	A2226	21
5960-99-000-2261	BM1038	52
5960-99-000-2262	BM1039	52
5960-99-000-2263	K305	†
5960-99-000-2273	K312	†
5960-99-000-2274	BS114	37
5960-99-000-2281	M537A	50
5960-99-000-2282	K308	†
5960-99-000-2284	4J50A	52
5960-99-000-2285	BS702	32
5960-99-000-2303	BS924	33
5960-99-000-2304	K324	43
5960-99-000-2306	BS156	35
5960-99-000-2307	BS158	35
5960-99-000-2308	BS116	37
5960-99-000-2309	BS118	37
5960-99-000-2311	BS200	35
5960-99-000-2312	BS202	35
5960-99-000-2313	BM1032	52
5960-99-000-2319	BM1006	48
5960-99-000-2322	BR161	13
5960-99-000-2323	BR179	13
5960-99-000-2324	CR176.	†
5960-99-000-2343	K335	43
5960-99-000-2351	BS456	33
5960-99-000-2359	BS156	35
5960-99-000-2362	M525	48
5960-99-000-2363	M525	48
5960-99-000-2364	M525	48
5960-99-000-2365	M525	48
5960-99-000-2366	M525	48
5960-99-000-2367	M525	48
5960-99-000-2368	M525	48
5960-99-000-2376	M521	51
5960-99-000-2378	BS718	32
5960-99-000-2379	BS720	32
5960-99-000-2381	N1034A	58
5960-99-000-2383	5762	†
5960-99-000-2393	N1010A	58
5960-99-000-2397	DET29	22
5960-99-000-2399	GXU3	6
5960-99-000-2412	M523	52
5960-99-000-2416*	C1149/1	16
5960-99-000-2423	BS730	32
5960-99-000-2424	M549	52
5960-99-000-2425	M539	52
5960-99-000-2426	M529	52
5960-99-000-2430	BS716	32
5960-99-000-2453	A2521	20
5960-99-000-2456	SC1/350	24
5960-99-000-2457	SC1/400	24
5960-99-000-2458	SC1/600	24
5960-99-000-2459	SC1/800	24
5960-99-000-2460	SC1/1000	24
5960-99-000-2461	SC1/1200	24
5960-99-000-2462	SC1/1400	24
5960-99-000-2463	2269Y	78
5960-99-000-2473	M538A	52
5960-99-000-2481	BS932	33
5960-99-000-2482	BS838	32
5960-99-000-2488	BS724 Series	32
5960-99-000-2494	K351	43
5960-99-000-2518	GXU2	6
5960-99-000-2519	4CX250B	17
5960-99-000-2520	8503	8
5960-99-000-2673	AH205/857B	6
5960-99-000-2723	AH213	†
5960-99-000-2736	3C24 (in pairs)	12
5960-99-000-2744	4J34	48
5960-99-000-2774	68504	†
5960-99-000-2775	68506	6
5960-99-000-2797	C178A/5894	16
5960-99-000-2799	C1134	16
5960-99-000-2852	2J56	†
5960-99-000-2858	3B24W	5
5960-99-000-2868	AFX203	7
5960-99-000-2871	BW140	14
5960-99-000-2872	BW153	14
5960-99-000-2902	GX402	†
5960-99-000-2957	5557	7
5960-99-000-2993	8503	8
5960-99-000-3521	FX229	†
5960-99-000-3528	M513A	50
5960-99-000-3540	8503	8
5960-99-000-3543	4D32	16
5960-99-000-3611	5586	48
5960-99-000-3629*	FX227	8
5960-99-000-3676	2J42	50
5960-99-000-3789	5842	20
5960-99-000-3840	BS462	35
5960-99-000-3926	BR1165	13
5960-99-000-3958	5657	48
5960-99-000-3982	M506A	51
5960-99-000-3997	M513B	50
5960-99-000-4020	0A2WA	23
5960-99-000-4028	0B2WA	23
5960-99-000-4048	QS1212	23
5960-99-000-4052	QS1202	†
5960-99-000-4053	QS1203	23
5960-99-000-4054	QS1213	23
5960-99-000-4079	A2293	20
5960-99-000-4080	75C1	23
5960-99-000-4082	A2426	21
5960-99-000-4107	A2913	20
5960-99-000-4120	A2975	20
5960-99-000-4515	K337	43
5960-99-000-5008	6080	20
5960-99-000-5018	4J52A	52
5960-99-000-5023	AFX234	7
5960-99-000-5027	5559	7
5960-99-000-5031	M548	†
5960-99-000-5060	Z759	21
5960-99-000-5130	K337	43
5960-99-000-5135	6027	50
5960-99-000-5141	BT95	7
5960-99-000-5167	BM1040	52
5960-99-000-5173	QS1215	23
5960-99-000-5730	K337	43
5960-99-000-6008	24B1	88
5960-99-037-0335	C1134	16
5960-99-037-2063	BR189	13
5960-99-037-2070	KT88	20
5960-99-037-2081	BS502	42
5960-99-037-2083	FX227	8
5960-99-037-2084	ZT1011	7
5960-99-037-2089	BR1162	13
5960-99-037-2097	A2599	20
5960-99-037-2101	K342	43
5960-99-037-2118	8503	8
5960-99-037-2119	N1034S	58
5960-99-037-2120	N1010S	58
5960-99-037-2156	CX1140	8
5960-99-037-2162	BS834	32
5960-99-037-2231	CX1191	8
5960-99-037-2238	5762	†
5960-99-037-2254	0A2WA	23
5960-99-037-2268	0B2WA	23
5960-99-037-2288	ACT28A	13
5960-99-037-2297	BS310	37
5960-99-037-2315	C1112	16
5960-99-037-2332	6861	54
5960-99-037-2361	N1045M	54
5960-99-037-2368	BS732	32
5960-99-037-2398	A2913	20
5960-99-037-2423	FX2505	8

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
5960-99-037-2432	BS836	32
5960-99-037-2563	N1016M	54
5960-99-037-2902	CV5819	78
5960-99-037-2909	N1017M	54
5960-99-037-2961	E702A	74
5960-99-037-2964	BS510	42
5960-99-037-2968	M537A	50
5960-99-037-3109	M554	46
5960-99-037-3112	M569P	48
5960-99-037-3120	BS840	32
5960-99-037-3124	DET29M	22
5960-99-037-3159	DET22	22
5960-99-037-3162	DET22D	22
5960-99-037-3164	C1136	16
5960-99-037-3172	N1033	55
5960-99-037-3176	GXU6	6
5960-99-037-3195	K359	43
5960-99-037-3196	E702B	†
5960-99-037-3200	BS204	33
5960-99-037-3201	BS286	33
5960-99-037-3202	M578B	48
5960-99-037-3212	A292	5
5960-99-037-3213	M570W	48
5960-99-037-3214	M569W	48
5960-99-037-3215	M579	48
5960-99-037-3238	DET23	22
5960-99-037-3263	A207	5
5960-99-037-3276	A2521	20
5960-99-037-3279	C1134	16
5960-99-037-3294	Z759	21
5960-99-037-3301	A2293	20
5960-99-037-3303	M543	†
5960-99-037-3304	M543	†
5960-99-037-3305	M543	†
5960-99-037-3307	M566	48
5960-99-037-3308	M566	48
5960-99-037-3309	M573	48
5960-99-037-3334	N1042M	54
5960-99-037-3335	C1134X	†
5960-99-037-3370	0A2	23
5960-99-037-3371	0B2	23
5960-99-037-3377	0A2WA	23
5960-99-037-3393	CR192A	17
5960-99-037-3466	TT21	16
5960-99-037-3472	3073Q	78
5960-99-037-3474	GXB160	88
5960-99-037-3500	BS390	33
5960-99-037-3518	BS714	32
5960-99-037-3584	C1149/1	16
5960-99-037-3590	BS440	35
5960-99-037-3736	8356	50
5960-99-037-3749	SC5/6000	24
5960-99-037-3760	SC5/6800	24
5960-99-037-3828	CX1140	8
5960-99-037-3829	4CX250B	17
5960-99-037-3996	BR1160	13
5960-99-037-3999	A2087	20
5960-99-037-4032	0C2	23

Type to be replaced	EEV/M-OV replacement	Page no
5960-99-037-4037	M566W	48
5960-99-037-4038	M570B	48
5960-99-037-4039	M569B	48
5960-99-037-4040	GXU50	6
5960-99-037-4063	P831	67
5960-99-037-4077	K391A	43
5960-99-037-4166	KY366CD/T	†
5960-99-037-4188	M577B	48
5960-99-037-4189	M595B	48
5960-99-037-4192	N1047M	54
5960-99-037-4242	QSC5/6800	24
5960-99-037-4288	GXU4	6
5960-99-037-4367	CX1159	8
5960-99-037-4407	T963Z	78
5960-99-037-4556	24B9	88
5960-99-037-4602	BR1161	13
5960-99-037-4603	BS816	37
5960-99-037-4627	4CX10,000D	17
5960-99-037-4671	E713B	74
5960-99-037-4672	K3007	43
5960-99-037-4673	M5005	51
5960-99-037-4688	BS390	33
5960-99-037-4689	BS426	33
5960-99-037-4690	BS430	33
5960-99-037-4952	BS814	37
5960-99-037-5016	K3101	†
5960-99-037-5146	4J52A	52
5960-99-037-5171	K391	43
5960-99-037-5177	M577B	48
5960-99-037-5295	BR1122	13
5960-99-037-5320	C1166	16
5960-99-037-5321	8626	66
5960-99-037-5332	SC2/3000	24
5960-99-037-5406	K3102M	†
5960-99-037-5426	N1034S	58
5960-99-037-5439	BS818	37
5960-99-037-5440	BS826	37
5960-99-037-5616	M599B	50
5960-99-037-5661	A2975	20
5960-99-037-5879	P863	67
5960-99-037-5940	M5035	48
5960-99-037-6033	CX1157	9
5960-99-037-6036	P896A	72
5960-99-037-6044	SC6/5000	24
5960-99-037-6045	SC6/7000	24
5960-99-037-6046	SC6/10000	24
5960-99-037-6047	SC6/14000	24
5960-99-038-0134	TWJ30	54
5960-99-038-0140	1774B	79
5960-99-038-0248	BS834	32
5960-99-038-0259	SC7/15000	24
5960-99-038-0260	SC7/E/14000	24
5960-99-038-0328	BS968	36
5960-99-038-0329	BS974	36
5960-99-038-0340	BS912	32
5960-99-038-0456	YD1400	20
5960-99-038-0505	BS800	33
5960-99-038-0529	BS960	37

Type to be replaced	EEV/M-OV replacement	Page no
5960-99-038-0530	1774A	79
5960-99-038-0595	E14-110GM	80
5960-99-038-0612	SC7/E/15000	24
5960-99-038-0670	N1094	57
5960-99-038-0711	E723	†
5960-99-118-0160	CX1180	9
5960-99-118-0680	M5032Q	49
5960-99-118-0681	M5033Q	49
5960-99-118-0722	1424A/G1	80
5960-99-118-0723	1446A/G1	80
5960-99-118-0737	BS876	32
5960-99-118-0853	SC1/800	24
5960-99-118-1205	1474B	80
5960-99-118-1449	SC7/15000	24
5960-99-118-1555	N1038	57
5960-99-118-1616	8541	66
5960-99-118-1689	5CX1500A	†
5960-99-118-1690	4CX35,000C	17
5960-99-118-1754	TWX22	57
5960-99-118-1763	FX2517	8
5960-99-118-1788	DET22	22
5960-99-118-1819	1074H	80
5960-99-118-1922	P831S	67
5960-99-118-2085	CX1528/GHT8	10
5960-99-118-2205	FX2518	†
5960-99-118-2274	724E	80
5960-99-118-2536	1496B	80
5960-99-118-2853	BS386	41
5960-99-118-3525	BS536	42
5960-99-118-3526	M5083A	48
5960-99-118-3717	BS138	32
5960-99-118-3721	K3103A	†
5960-99-118-3769	D3a	20
5960-99-118-3937	BS930	35
5960-99-196-4635	K3080	43
5960-99-417-6195	GT1C	6
5960-99-417-6220	KT88	20
5960-99-522-3862	UFC100/30/120J	30
5960-99-527-9185	TWX34	57
5960-99-711-9597	M569Q	48
5960-99-714-5244	6027H	50
5960-99-714-5521	6027	50
5960-99-715-2134	N4001	54
5985-99-519-7065	BS804	38
5985-99-519-7066	BS802	38
6027	6027	50
6027H	6027H	50
6031	5559	7
6073	0A2WA	23
6074	0B2	23
6080	6080	20
6080WA	6080WA	20
6093	CV4005	5
6130	FX227	8
6155*	C1108	16
6156*	C1112	16
6166*	6166A	17
	CR192A	17

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
6166A	6166A	17
6198	7735A	65
6240-99-996-4114	XL615/4/3	76
6252*	C1134	16
6268/4C35	FX2505	8
6279/5C22	8503	8
6279A	8503	8
6326	7038	65
6334	BS918	35
6346*	BK448/5551A	4
6347*	BK484/5552A	4
6348*	BK486/5553B	4
6354	QS1200	23
6421*	BR1124	13
6511*	BK5822A	4
6512*	BK504/5554	4
6513*	BK46/5555	4
6522	8503	8
6550	KT88	20
6587	6587	8
6587A	6587	8
6626	0A2WA	23
6627	0B2WA	23
6693	AH2511	6
6696*	BW194	14
6777	FX2530/6777	8
6786*	BT69	7
6807	BT127	7
6856*	BT125	7
6858	BT127	7
6861	6861	54
6866*	E702B	†
6960	BW1162	14
6961	BR1162	13
6972	M575	52
6975	K3078/6975	43
7007	6166A	17
7021	BK448/5551A	4
7028	M599B	50
7031	BK484/5552A	4
7034	4CX250B	17
7038	7038	65
7041	BK486/5553B	4
7092	B1153	12
7171	BK476	4
7182	7182	48
7207*	BK488	4
7226*	7262A	65
7226A*	P831	67
7237	BR1162	13
7262A	7262A	65
7290	P8034	65
7291	7038	65
7293 Series	P875	70
7294 Series	P874	70
7295 Series	7295C	70
7325	7735A	65
7381	BS918	35
7384	CX1140	8
7389 Series	7389C	70
7527	C1136	16
7568	FX2519A/5949A	8
7590	FX2519A/5949A	8
7603	FX2505	8
7623	TT21	16
7624	TT22	16
7642	TWS10/7642	55
7665*	CX1157	9
7669	BK492/7669	4
7670*	BK492/7669	4
7671	BK494/7671	4
7673	BK498/7673	4
7681	BK544	4
7697	7735A	65
7703	7703	4
7721	D3a	20
7722	E280F	21
7735	7735	65
7735A	7735A	65
7735B	7735B	65
7735BX	7735BX	65
7782*	CX1177	9
8051	8051	68
8093 Series	P874	70
8134	8134	67
8134V1/4811	8134V1/4811	67
8134VB	8134V1/4811	67
8168	4CX1000A	17
8168/4CX1000A	4CX1000A	17
8170	4CX5000A	17
8170/4CX5000A	4CX5000A	17
8171	4CX10,000D	17
8171/4CX10,000D	4CX10,000D	17
8252*	C1149/1	16
8269*	BR1196	13
8281	4CX15,000A	17
8329	8503	8
8349	4CX35,000C	17
8349/4CX35,000C	4CX35,000C	17
8356	8356	50
8360*	BK492/7669	4
8370	FX2517	8
8424	8503	8
8438	C1136	16
8480	8480	68
8480V1	8480V1/4810	68
8484	7735B	65
8485*	8507A	66
8488	6587	8
8503	8503	8
8507	8507	66
8507A	8507A	66
8521	8521	68
8541	8541	66
8541A	8541A	66
8566	8626	66
8572	8572A	66
8572A	8572A	66
8604	P844	66
8625	8625	66
8626	8626	66
8660	4CX1500B	17
8673	P882	70
8673S	P882	70
8674	P883	70
8674S	P883	70
8684	BM25L	46
8748	P872	70
8749	P873	70
8765	FX2517	8
8775	P883	70
8803	FX2505	8
9549	P874	70
	P875	70
9564	7295C	70
9565	7389C	70
9620*	P849D	66
9677B	8541A	66
9677C	8541	66
9677D	P842F	†
9677F1	P844	66
9677F2	P844	66
9677M	P849D	66
9677P	P849D	66
9677S1	8626	66
9677S2	8541A	66
9677SC	8541A	66
9706	P866	66
9728	P8031	66
9728D	P8031F	66
9728Q	P8031Z	66
9730	P863	67
9812PA	8541	66
9814PA	P831	67
9817PA	8626	66
10667B	7735B	65
10667F	7038	65
10667G	7735A	65
10667M	P826/4478	65
10667S	7735A	65
10667SC	7735B	65
38217	5557	7
55850*	7038	65
55850F	P844	66
55850N	8541	66
55850S	8541A	66
55875	P8000	64
55875-IG	P8000 IG	64
55875B	P8000B	64
55875B-IG	P8000B IG	64
55875G	P8000G	64
55875G-IG	P8000G IG	64
55875L	P8000L	64
55875R	P8000R	64

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
55875R-IG	P8000R IG	64
68506	68506	6
A207	A207	5
A237	A237	5
A239	3B24W	5
A292	A292	5
A2087	A2087	20
A2134	A2134	21
A2226	A2226	21
A2293	A2293	20
A2426	A2426	21
A2521	A2521	20
A2599	A2599	20
A2900	A2900	20
A2913	A2913	20
A2975	A2975	20
A3012	A3012	22
A3042	A3042	21
A3283	A3283	21
A3341	A3341	20
A3343	A3343	22
A3394	YD1400	20
ACM3	ACM3	13
ACM3*	BR1167	13
ACS4	ACS4	17
ACS5	4CX5000A	17
ACT9	ACT9	13
ACT9B	ACT9B	13
ACT14*	BR140	13
ACT25	ACT25	13
ACT27	ACT27	13
ACT28	ACT28	13
ACT28A	ACT28A	13
ACT70	BR1160	13
AF31-10	3069Q	78
AFX203	AFX203	7
AFX212	6D4	7
AFX234	AFX234	7
AG866A	GU12	6
AG5209	QS1209/5651	23
AG5210	0B2	23
AG5211	0A2	23
AH201	GU12	6
AH205	AH205/857B	6
AH205/857B	AH205/857B	6
AH211	AH211A	6
AH211A	AH211A	6
AH221	AH221	6
AH238	AH238	6
AH2511	AH2511	6
AJ5551	BK448/5551A	4
AJ5552	BK484/5552A	4
AJ6346*	BK448/5551A	4
AJ6347*	BK484/5552A	4
AL13-36	AL13-36	78
AL16-10	F16-10LD	78
AL21-12	F21-10LD	78
AL22-10*	2273D	78

Type to be replaced	EEV/M-OV replacement	Page no
AL22-10D	2273D	78
AL31-10	3073Q	78
AN1	GT1C	6
AP31-10	3096Q	78
AP413	BS990	33
AR10T	BK484/5552A	4
AR14T	BK448/5551A	4
AR31	BK66/5550	4
ASG5017	5557	7
ASG5044B	BT125	7
ASG5045B	BT127	7
ASG5544	BT125	7
ASG5545	BT127	7
ASG6807	BT127	7
ATC10-50*	U50/15/30	26
	U50/20/40	26
ATC15-75*	U75/15/40	26
	U80/15/40	26
AW17-20	AW17-20	79
AW36-48	AW36-48	79
AX4-125A/4D21*	C1108	16
AX4-250A/5D22*	C1112	16
AX224	GXU1	6
AX228	GXU3	6
AX230	GXU2	6
AX9903/5894*	C178A/5894	16
AX9903*	C178A/5894	16
AX9904	BW1165	14
AX9904R	BR1165	13
AX9907R	ACS4	17
AX9910*	C1134	16
AX9911	FX2505	8
AX9912	8503	8
B1109	3C24	12
B1152	B1152	12
B1153	B1153	12
B1510	B1510	12
BA9-20	N1010	58
BA9-20M*	N1010	58
BEL03a	3B24W	5
BEL2a	GXU1	6
BEL2a-1	GU12	6
BEL5a	GXU2	6
BEL40a	AH205/857B	6
BEL125	C1108	16
BEL250	C1112	16
BEL250CX	4CX250B	17
BEL400	C1136	16
BK24	BK484/5552A	4
BK24/5552A	BK484/5552A	4
BK34	BK486/5553B	4
BK42	BK448/5551A	4
BK42/5551A	BK448/5551A	4
BK44	BK504/5554	4
BK44/5554	BK504/5554	4
BK46	BK46/5555	4
BK46/5555	BK46/5555	4
BK66	BK66/5550	4

Type to be replaced	EEV/M-OV replacement	Page no
BK66/5550	BK66/5550	4
BK146	BK486/5553B	4
BK146/5553B	BK486/5553B	4
BK168	BK5822A	4
BK168/5822A	BK5822A	4
BK178	BK488	4
BK194	BK496	4
BK394	BK506	4
BK416	7703	4
BK416/7703	7703	4
BK428	BK472	4
BK442	BK492/7669	4
BK442/7669	BK492/7669	4
BK444	BK494/7671	4
BK444/7671	BK494/7671	4
BK446	BK498/7673	4
BK446/7673	BK498/7673	4
BK448/5551A	BK448/5551A	4
BK472	BK472	4
BK474	BK474	4
BK476	BK476	4
BK482	BK482	4
BK484	BK484/5552A	4
BK484/5552A	BK484/5552A	4
BK486	BK486/5553B	4
BK486/5553B	BK486/5553B	4
BK488	BK488	4
BK492/7669	BK492/7669	4
BK494/7671	BK494/7671	4
BK496	BK496	4
BK498/7673	BK498/7673	4
BK500	BK500	4
BK502	BK502	4
BK504/5554	BK504/5554	4
BK506	BK506	4
BK542/1081	BK502	4
BK544	BK544	4
BK5822A	BK5822A	4
BL27	BS918	35
BLM-311	M5109	52
BLT088	BS192	35
BLT119	BS110	33
BM25L Series	BM25L Series	46
BM1001	M5125	47
BM1001A	M5125	47
BM1002	BM1002	50
BM1003	BM1003	48
BM1004	BM1004	48
BM1005	BM1005	48
BM1006	BM1006	48
BM1026	BM1026	51
BM1027	BM1027	51
BM1028	BM1028	51
BM1029	BM1029	51
BM1030	BM1030	51
BM1031	BM1031	51
BM1032	BM1032	52
BM1033	BM1033	52

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
BM1034	BM1034	52
BM1035	BM1035	52
BM1036	BM1036	52
BM1037	BM1037	52
BM1038	BM1038	52
BM1039	BM1039	52
BM1040	BM1040	52
BR140	BR140	13
BR152B	ACT9	13
BR161	BR161	13
BR179	BR179	13
BR189	BR189	13
BR191B	BR1160	13
BR194	BR194	13
BR1102	BR1102	13
BR1106	BR1106	13
BR1121	BR1121	13
BR1122	BR1122	13
BR1124	BR1124	13
BR1126	BR1126	13
BR1131A	BR1131A	13
BR1143	BR1143	13
BR1151*	BR1161	13
BR1160	BR1160	13
BR1161	BR1161	13
BR1162	BR1162	13
BR1165	BR1165	13
BR1167	BR1167	13
BR1169	BR1513	13
BR1181	BR1513	13
BR1182	BR1182	13
BR1183	BR1183	13
BR1195	BR1195	13
BR1196	BR1196	13
BR1512	BR1512	13
BR1512A	BR1512A	13
BR1513	BR1513	13
BR1513F	BR1513F	13
BS48	BS48	37
BS50C	BS50C	41
BS50L	BS50L	41
BS50S	BS50S	41
BS50X	BS50X	41
BS52	BS52	35
BS52A	BS52A	35
BS58	BS58	33
BS60	BS60	38
BS66	BS66	38
BS70	BS70	38
BS72	BS72	38
BS78	BS78	38
BS80	BS80	38
BS82	BS82	37
BS84	BS84	37
BS90	GXA95	88
BS92	BS92	37
BS100	DA100	12
BS102	BS102	34

Type to be replaced	EEV/M-OV replacement	Page no
BS104	BS104	33
BS108	BS108	36
BS110	BS110	33
BS114	BS114	37
BS116	BS116	37
BS118	BS118	37
BS120	BS120	38
BS122	BS122	36
BS128	BS128	32
BS130	BS130	37
BS138	BS138	32
BS148	BS148	37
BS156	BS156	35
BS158	BS158	35
BS162	BS162	36
BS166	BS166	38
BS168	BS168	38
BS170	BS170	33
BS172	BS172	33
BS180	BS180	34
BS190	BS190	34
BS192	BS192	35
BS194	BS194	34
BS196	BS196	35
BS200	BS200	35
BS202	BS202	35
BS204	BS204	33
BS206	BS206	36
BS208	BS208	38
BS220	BS220	34
BS224	BS224	34
BS226	BS226	34
BS228	BS228	35
BS232	BS232	36
BS248	BS248	37
BS254	BS254	36
BS256	BS256	36
BS258	BS258	36
BS260	BS260	36
BS264	BS264	36
BS274	BS274	36
BS286	BS286	33
BS306	BS306	38
BS310	BS310	37
BS314	BS314	35
BS316	BS316	35
BS324	BS324	33
BS332	BS810	35
BS338	BS338	38
BS340	BS340	41
BS342	BS342	41
BS344	BS344	41
BS384	BS384	41
BS386	BS386	41
BS390	BS390	33
BS392	BS392	38
BS402	BS402	38
BS412	BS412	37

Type to be replaced	EEV/M-OV replacement	Page no
BS426	BS426	33
BS430	BS430	33
BS440	BS440	35
BS450	BS450	35
BS452	BS452	35
BS456	BS456	33
BS460	BS460	38
BS462	BS462	35
BS466	BS466	35
BS470	GXE30	88
BS500	BS500	36
BS502	BS502	42
BS506	BS510	42
BS510	BS510	42
BS512	BS512	42
BS514	BS514	42
BS516	BS516	42
BS524	BS524	42
BS528	BS528	42
BS534	BS534	42
BS536	BS536	42
BS538	BS538	42
BS540	BS540	42
BS546	BS546	42
BS582	BS582	39
BS598	BS598	39
BS600	BS600	42
BS602	BS602	42
BS604	BS604	41
BS606	BS606	41
BS608	BS608	39
BS610	BS610	41
BS610A	BS610A	41
BS610B	BS610B	41
BS610C	BS610C	41
BS614	BS614	42
BS616	BS616	39
BS620	BS620	41
BS624	BS624	39
BS628	BS628	41
BS630	BS630	39
BS632	BS632	41
BS636	BS636	41
BS638	BS638	41
BS640	BS640	40
BS642	BS642	41
BS644	BS644	40
BS646	BS646	40
BS648	BS648	40
BS650	BS650	41
BS652	BS652	38
BS658	BS658	40
BS660	BS660	40
BS662	BS662	40
BS674	BS674	40
BS676	BS676	40
BS678	BS678	40
BS684	BS684	41

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
BS690	BS690	41
BS692	BS692	41
BS696	BS696	41
BS698	BS698	40
BS702	BS702	32
BS708	BS708	32
BS710	BS710	32
BS714	BS714	32
BS716	BS716	32
BS718	BS718	32
BS720	BS720	32
BS724	BS724	32
BS726	BS726	32
BS728	BS728	32
BS730	BS730	32
BS732	BS732	32
BS742	BS742	39
BS748	BS748	39
BS750	BS750	40
BS752	BS752	40
BS756	BS756	40
BS758	BS758	40
BS760	BS760	40
BS762	BS762	40
BS764	BS764	40
BS774	BS774	40
BS776	BS776	40
BS778	BS778	40
BS798	BS798	32
BS800	BS800	33
BS802	BS802	38
BS804	BS804	38
BS806	BS806	38
BS810	BS810	35
BS812	BS812	37
BS814	BS814	37
BS816	BS816	37
BS818	BS818	37
BS820	BS820	37
BS822	BS822	35
BS824	BS824	33
BS826	BS826	37
BS828	BS828	37
BS830	BS830	37
BS832	BS832	33
BS834	BS834	32
BS836	BS836	32
BS838	BS838	32
BS840	BS840	32
BS842	BS842	35
BS844	BS844	37
BS846	BS846	33
BS848	BS848	33
BS850	BS450	35
BS852	BS852	33
BS854	BS854	38
BS856	BS856	34
BS858	BS858	34

Type to be replaced	EEV/M-OV replacement	Page no
BS860	BS860	35
BS864	BS864	38
BS870	BS870	32
BS872	BS872	32
BS876	BS876	32
BS880	BS880	32
BS882	BS882	37
BS886	BS886	37
BS888	BS888	38
BS892	BS892	35
BS894	BS894	33
BS896	BS896	37
BS898	BS898	32
BS904	BS904	33
BS908	BS908	37
BS910	BS910	32
BS912	BS912	32
BS914	BS914	35
BS916	BS916	33
BS918	BS918	35
BS924	BS924	33
BS928	BS928	35
BS930	BS930	35
BS932	BS932	33
BS940	BS940	32
BS946	BS946	33
BS950	BS950	37
BS952	BS952	36
BS956	BS956	35
BS958	BS958	36
BS960	BS960	37
BS962	BS962	37
BS966	BS966	34
BS968	BS968	36
BS970	BS970	35
BS974	BS974	36
BS976	BS976	36
BS986	BS986	32
BS990	BS990	33
BS994	BS994	33
BT5	BT5	7
BT17	BT17	7
BT19	BT19	7
BT29	BT29	7
BT69	BT69	7
BT77	BT127	7
BT77A	BT127	7
BT79	FX227	8
BT83	8503	8
BT89	BT89	7
BT91	BT125	7
BT91A	BT125	7
BT95	BT95	7
BT109	BT127	7
BT125	BT125	7
BT127	BT127	7
BT129	BT129	7
BTL6-1*	BR179	13

Type to be replaced	EEV/M-OV replacement	Page no
BTL6-1*	BR1106	13
	BR1124	13
BTL15-2*	BR161	13
	BR1102	13
BW140	BW140	14
BW153	BW153	14
BW179	BW179	14
BW189	BW189	14
BW194	BW194	14
BW1102	BW1102	14
BW1102J2	BW1102J2	14
BW1121	BW1121	14
BW1121J1	BW1121J1	14
BW1121J2	BW1121J2	14
BW1122	BW1122	14
BW1124	BW1124	14
BW1124J1	BW1124J1	14
BW1124J2	BW1124J2	14
BW1143	BW1143	14
BW1143J2	BW1143J2	14
BW1144	BW1144	14
BW1156	BW1156	14
BW1162	BW1162	14
BW1162J3	BW1162J3	14
BW1165	BW1165	14
BW1165J3	BW1165J3	14
BW1169J3	BW1513J2	14
BW1176J1	BW1176J1	14
BW1176J2	BW1176J2	14
BW1181J3	BW1513J2	14
BW1182J1	BW1182J1	14
BW1182J2	BW1182J2	14
BW1183J1	BW1183J1	14
BW1183J2	BW1183J2	14
BW1184J2	BW1184J2	14
BW1185J2	BW1185J2	14
BW1186J2	BW1186J2	14
BW1195	BW1195	14
BW1195J3	BW1195J3	14
BW1196	BW1196	14
BW1196J3	BW1196J3	14
BW1513J2	BW1513J2	14
BW1513J2F	BW1513J2F	14
BW4027	BW4027	14
BW4028	BW4028	14
BW4029	BW4029	14
BW4034	BW4034	14
BW4035	BW4035	14
BW4050	BW4050	14
BW4070	BW4070	14
BW4088A	BW4088A	14
BW4088B	BW4088B	14
BWS1	BWS1	58
BWS2	BWS2	58
BWX5	BWX5	58
BY189A	BY189A	15
BY194	BY194	15
BY1102	BY1102	15

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
BY1121	BY1121	15
BY1122	BY1122	15
BY1124	BY1124	15
BY1143	BY1143	15
BY1144	BY1144	15
BY1144L	BY1144L	15
BY1151*	BY1161	15
BY1156	BY1156	15
BY1161	BY1161	15
BY4030	BY4030	15
BY4031	BY4031	15
BY4032	BY4032	15
BY4033	BY4033	15
BY4036	BY4036	15
BY4037	BY4037	15
BY4038	BY4038	15
BY4038A	BY4038A	15
BY4039	BY4039	15
BY4048A	BY4048A	15
BY4049	BY4049	15
BY4059	BY4059	15
BY4060	BY4060	15
BY4063	BY4063	15
BY4064	BY4064	15
BY4093	BY4093	15
C1A*	AFX203	7
C3J	ZT1011	7
C3JA	ZT1011	7
C6J*	BT127	7
C6J-A*	BT127	7
C6J-K*	BT127	7
C6J-KNe*	BT127	7
C102A	P8031	66
C102B	8541	66
C103A	P8030	†
C103B	8541A	66
C104A*	P844	66
C104B	P844	66
C105A	P8031Z	66
C105B	P849Z	66
C178A	C178A/5894	16
C178A/5894	C178A/5894	16
C910/2325	3069R	78
C932*	7735A	65
C933*	7038	65
C960	P874	70
	P875	70
C962	P874	70
C1108	C1108	16
C1111*	C1150/1	16
C1112	C1112	16
C1123	4D32	16
C1133*	C1149/1	16
C1134	C1134	16
C1136	C1136	16
C1148	C1148	16
C1149	C1149/1	16
C1149/1	C1149/1	16

Type to be replaced	EEV/M-OV replacement	Page no
C1150	C1150/1	16
C1150/1	C1150/1	16
C1166	C1166	16
C1534	C1534	16
C9132A	P8031	66
C9133A	P8031	66
C9138A	P8031	66
CAS1	CAS1	18
CAT6	BW140	14
CAT9	BW153	14
CAT100	CAT100	14
CCS1	CCS1	16
CCS2	CCS2	16
CCS3	YL1550	16
CE309	5557	7
CFDP2000	UFC2000/8/125J	30
CFED450	UFC450/12/125J	30
	UFC450/15/125J	30
CFED500	UFC500/12/125J	30
	UFC500/15/125J	30
CFED1000	UFC1000A/12/125J	30
	UFC1000A/15/125J	30
CFFP2000	UFC2000/20/200J	30
CFHD100	UFC100/30/120J	30
CFHE6.5	UFC6/30/140J	30
CFHE12	UFC12/30/140J	30
CFHE18.5	UFC18/30/140J	30
CFHE34	UFC34/30/140J	30
CFHE40	UFC40/30/140J	30
CFHE50	UFC50/30/140J	30
CFHP1000-50S	UFC1000/30/200J	30
CIC4	WGI6100	60
CIC5	WGI9050	60
CIC6	WGI9050	60
CIC7	WGI9020	60
CIC8	WGI9020	60
CIC9	WGI9020	60
CIC10	WGI9020	60
CIC39	WGI9020	60
CIC40	WGI9020	60
CIC41	WGI9020	60
CIC42	WGI7100	60
CIC43	WGC2100	62
CIC44	WGC2100	62
CIC45	WGC2100	62
CIS14	3CC115SA	60
CIS15	3CC120SB	60
CIS16	3CC115SC	60
CIS17	3CC120SD	60
CIS18	3CC115SA	60
CIS19	3CC120SB	60
CIS20	3CC115SC	60
CIS21	3CC120SD	60
CIS23	5CC1151	61
CIS24	5CC1152	61
CIS27	3CC115SG	60

Type to be replaced	EEV/M-OV replacement	Page no
CIS28	3CC120SH	60
CIS29	3CC115SA	60
CIS30	3CC120SB	60
CIS37	3CC120SK	60
CIX38	WGC4100	62
CIX48	WGC4100	62
CMV1-500	UCM500/5/25	28
CMV1-2000	UCM2000/5/40	28
CO43*	N1010	58
CO119*	N1034	58
CQL5-1	4CX5000A	17
CR144A	CR144A	80
CR192	CR192A	17
CR192A	CR192A	17
CR1501	CR1501	17
CR1502	CR1502	17
CR1505	CR1505	17
CT1-500	BT19	7
CT1-2500	5559	7
CV3W-1000*	UCW1000/30/500	29
CV5	AH221	6
CV28	ACT9	13
CV32	GU12	6
CV45	S130P	23
CV120A	BM1014	†
CV120B	BM1015	†
CV120C	BM1016	†
CV187	U19	5
CV188	QS92/10	†
CV273	DET22	22
CV284	QS75/20	23
CV286	QS95/10	23
CV287	QS150/15	23
CV294	BS710	32
CV295	GXA85	88
CV345	12E1	20
CV354	DET23	22
CV372	FX227	8
CV395	QS150/45	23
CV397	DET24	22
CV402	GXA80	88
CV403	24B9	88
CV422	QS108/45	23
CV427	C1150/1	16
CV429 (Tet)	MF31-55	78
CV434	QS75/60	23
CV436	ACT25	13
CV449	QS1209/5651	23
CV460	BS48	37
CV461	BS92	37
CV462	BS84	37
CV463	BS82	37
CV482	A237	5
CV488	GXA95	88
CV513	4J53	48
CV532	AH211A	6
CV789	3C24	12
CV1067	L63	20

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
CV1075	KT66	20
CV1128	GT1C	6
CV1144	BT19	7
CV1147	BT5	7
CV1219	DA100	12
CV1252	V1505	12
CV1435	AH221	6
CV1475	CV1475	46
CV1476	CV1476	46
CV1477	CV1477	46
CV1478	CV1478	46
CV1479	CV1479	46
CV1480	CV1480	46
CV1481	CV1481	46
CV1482	CV1482	46
CV1483	CV1483	46
CV1484	CV1484	46
CV1485	CV1485	46
CV1486	CV1486	46
CV1522	CV1522	80
CV1619	V1505	12
CV1629	AH238	6
CV1742	BK504/5554	4
CV1743	GXA60	88
CV1747	M505	51
CV1787	FX2505	8
CV1832	0A2	23
CV1833	0B2	23
CV1835	GXU1	6
CV1841	BS52	35
CV1858	GXA130	88
CV1859	GXA160	88
CV1866	2J42	50
CV1881	BS384	41
CV1892*	K3033	†
CV1897	4J34	48
CV1898	4J35	48
CV1914	4J31	48
CV1916	4J33	48
CV1923	BS810	35
CV1932	L63	20
CV1949	6D4	7
CV1994	ACT9B	13
CV2012*	QS1209/5651	23
CV2109	BT89	7
CV2124	BK484/5552A	4
CV2130	C1108	16
CV2131	C1112	16
CV2138	GM4	87
CV2139	EHM2S	87
CV2157	BS710	32
CV2160	A207	5
CV2163	ACT28	13
CV2164	K302	43
CV2171	A2087	20
CV2179	A2134	21
CV2181	BS104	33
CV2186	BM1031	51

Type to be replaced	EEV/M-OV replacement	Page no
CV2203	FX215	†
CV2210	BT125	7
CV2215	BT127	7
CV2225	QS1200	23
CV2231	A2226	21
CV2261	BM1038	52
CV2262	BM1039	52
CV2274	BS114	37
CV2281	M537A	50
CV2284	4J50A	52
CV2285	BS702	32
CV2303	BS924	33
CV2304	K324	43
CV2306	BS156	35
CV2307	BS158	35
CV2308	BS116	37
CV2309	BS118	37
CV2311	BS200	35
CV2312	BS202	35
CV2313	BM1032	52
CV2319	BM1006	48
CV2322	BR161	13
CV2323	BR179	13
CV2341	CV2341	20
CV2343	K335	43
CV2351	BS456	33
CV2359	BS156	35
CV2362	M525	48
CV2363	M525	48
CV2364	M525	48
CV2365	M525	48
CV2366	M525	48
CV2367	M525	48
CV2368	M525	48
CV2376	M521	51
CV2378	BS718	32
CV2379	BS720	32
CV2381	N1034A	58
CV2393	N1010A	58
CV2394	DA42	12
CV2397	DET29	22
CV2399	GXU3	6
CV2412	M523	52
CV2416*	C1149/1	16
CV2424	M549	52
CV2425	M539	52
CV2426	M529	52
CV2430	BS716	32
CV2453	CV2453	20
CV2456	SC1/350	24
CV2457	SC1/400	24
CV2458	SC1/600	24
CV2459	SC1/800	24
CV2460	SC1/1000	24
CV2461	SC1/1200	24
CV2462	SC1/1400	24
CV2463	2269Y	78
CV2473	M538A	52

Type to be replaced	EEV/M-OV replacement	Page no
CV2481	BS932	33
CV2482	BS838	32
CV2488	BS724 series	32
CV2494	K351	43
CV2518	GXU2	6
CV2520	8503	8
CV2673	AH205/857B	6
CV2736	3C24 (in pairs)	12
CV2744	CV2744	48
CV2775	68506	6
CV2797	C178A/5894	16
CV2799	C1134	16
CV2815	GXU2	6
CV2826	BS914	35
CV2858	3B24W	5
CV2868	AFX203	7
CV2871	BW140	14
CV2872	BW153	14
CV2902	GX402	†
CV2957	5557	7
CV2984	6080	20
CV2993	8503	8
CV3521	FX2519A/5949A	8
CV3528	M513A	50
CV3540*	8503	8
CV3543	4D32	16
CV3611	5586	48
CV3629*	FX227	8
CV3676	2J42	50
CV3745	BS58	33
CV3789	CV3789	20
CV3840	BS462	35
CV3926	BR1165	13
CV3958	5657	48
CV3982	M506A	51
CV3997	M513B	50
CV4005	CV4005	5
CV4020	0A2WA	23
CV4028	0B2WA	23
CV4048	QS1212	23
CV4053	QS1203	23
CV4054	QS1213	23
CV4062	CV4062	21
CV4079	CV4079	20
CV4080	75C1	23
CV4082	A2426	21
CV4085	CV4085	21
CV4100	0A2WA	23
CV4101	0B2WA	23
CV4107	A2913	20
CV4120	A2975	20
CV4515	K337	43
CV5008	6080WA	20
CV5018	4J52A	52
CV5023	AFX234	7
CV5027	5559	7
CV5060	Z759	21
CV5083*	CV5083	23

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
CV5130	K337	43
CV5135	6027	50
CV5141	BT95	7
CV5167	BM1040	52
CV5173	QS1215	23
CV5207	1B59	75
CV5218	BR189	13
CV5219	ACS4	17
CV5220	KT88	20
CV5234	ZT1011	7
CV5239	BR1162	13
CV5242	A2599	20
CV5247	FX2505	8
CV5249	K3078/6975	43
CV5285	QS1212	23
CV5300*	2273D	78
CV5326	ACT28A	13
CV5343	C1112	16
CV5362	6861	54
CV5386	N1045M	54
CV5398	BS732	32
CV5400	CV5400	22
CV5403	N1033	55
CV5413	A2913	20
CV5426	K350	†
CV5427	FX2505	8
CV5438	TWC5	56
CV5458	DET22E	22
CV5819	T957Y	78
	3073Q	78
CV5844	SC2/3000	24
CV5877	E702A	74
CV5923	M554	46
CV5956	DET22	22
CV5959	C1136	16
CV5962	DET22D	22
CV5968	GXU6	6
CV5985	K359	43
CV5987	E702B	†
CV5990	BS204	33
CV5991	BS286	33
CV5992	M578B	48
CV5998	A292	5
CV5999	M570	48
CV6003	K342	43
CV6005	BS502	42
CV6007	FX227	8
CV6008	24B1	88
CV6022	8503	8
CV6023	N1034S	58
CV6024	N1010S	58
CV6028	BS834	32
CV6051	CX1191	8
CV6065	SC1/1600	24
CV6066	SC1/1800	24
CV6067	SC1/2000	24
CV6070	BS310	37
CV6085	TWS6	55

Type to be replaced	EEV/M-OV replacement	Page no
CV6086	BS836	32
CV6091	A2900	20
CV6098	N1016M	54
CV6106	N1017M	54
CV6107	BS510	42
CV6108	M537A	50
CV6110	BS840	32
CV6117	TWS7	55
CV6129	BS714	32
CV6131	C1149/1	16
CV6132	BS440	35
CV6142	K391A	43
CV6157	TWS6	55
CV6167	T963Z	78
CV6172	T989Z	78
CV6173	24B9	88
CV6178	BS816	37
CV6179	TWS17	54
CV6180	TWC18	54
CV6181	TWX19	54
CV6184	4CX10,000D	17
CV6192	BS814	37
CV6194	K391	43
CV6206	BS818	37
CV6207	BS826	37
CV6217	769H	79
CV6229	1478E	78
CV6240	P896A	72
CV6241	CX1157	9
CV6243	P863	67
CV8001	M569	48
CV8002	M579	48
CV8025	12E1	20
CV8026	DET23	22
CV8051	A207	5
CV8062	GXU3	6
CV8064	A2521	20
CV8067	C1134	16
CV8082	Z759	21
CV8089	A2293	20
CV8091	M543	†
CV8092	M543	†
CV8093	M543	†
CV8096	M566	48
CV8097	M566	48
CV8098	M573	48
CV8114	7ABP7A	78
CV8131	N1042M	54
CV8132	C1134X	†
CV8161	0A2	23
CV8162	0B2	23
CV8168	0A2WA	23
CV8198	5842	20
CV8232	6080WA	20
CV8244	CR192A	17
CV8286	TT21	16
CV8293	T957Y	78
	3073Q	78

Type to be replaced	EEV/M-OV replacement	Page no
CV8295	4CX5000A	17
CV8296	GXB160	88
CV8317	BS390	33
CV8404	FX2519A/5949A	8
CV8505	8356	50
CV8530	SC5/6000	24
CV8563	CX1140	8
CV8632	CR144A	80
CV8671	GXK20	88
CV8699	4CX10,000D	17
CV8730	BR1160	13
CV8733	A2087	20
CV8766	0C2	23
CV8771	M566	48
CV8772	M570	48
CV8773	M569	48
CV8774	GXU50	6
CV8797	P831	67
CV8904	M577B	48
CV8905	M595B	48
CV8908	N1047M	54
CV8960	QSC5	24
CV8978	A2426	21
CV9006	GXU4	6
CV9080	CX1159	8
CV9335	T957Z	78
CV9335*	3069Q	78
CV9343	BR1161	13
CV9422	E713B	74
CV9423	K3007	43
CV9424	M5005	51
CV9442	BS390	33
CV9443	BS426	33
CV9444	BS430	33
CV9492	K311	43
CV9510	CV9510	80
CV9833	M554	46
CV9874	T957Y	78
	3073Q	78
CV9918	4CX1000A	17
CV10013	K3101	†
CV10210	M577B	48
CV10332	6080	20
CV10361	ACM3	13
CV10368	BR1122	13
CV10369	ACS4	17
CV10374	K3099	45
CV10404	C1166	16
CV10406	8626	66
CV10466	4KM50,000LR	44
CV10470*	1478E	78
CV10570	K3102M	†
CV10611	N1034S	58
CV10664	150C4	23
CV10703	T940R	79
CV10704	T940B	79
CV10705	T940G	79
CV10757	F21-10LD	78

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
CV10758	M599B	50
CV10775	E280F	21
CV10804	D3a	20
CV10813	A2975	20
CV10949	T989Z	78
CV10951	T988Z	78
CV11039	TWC14	56
CV11107	4CX35,000C	17
CV11154	M5035	48
CVCC2500	UC2500/5/60J	28
CVDD200	UC200/15/70	28
CVDD300	UC300/10/70J	28
CVDD1000	UC1000/8/125J	28
	UC1000/10/125J	28
CVDP1500	UC1500/8/125J	28
	UC1500/10/125J	28
CVDP2300	UC2300/10/125J	28
CVFP250	UC250/25/125J	28
CVFP750	UC750/20/150J	28
CVFP1000	UC1000/20/150J	28
CVFP1500	UC1500/20/150J	28
CVHP250	UC250/30/150J	28
CVHP450	UC450/30/150J	28
CVHP650	UC650/30/150J	28
CW1506J2	CW1506J2	18
CWV1-1000-50S*	UCW1000/30/500	29
CX1119	CX1140	8
CX1120	CX1191	8
CX1140	CX1140	8
CX1154	CX1154	9
CX1154B	CX1154B	9
CX1157	CX1157	9
CX1159	CX1159	8
CX1168	CX1168	9
CX1168B	CX1168B	9
CX1171	CX1171	9
CX1171B	CX1171B	9
CX1174	CX1174	9
CX1174B	CX1174B	9
CX1175	CX1175	9
CX1175B	CX1175B	9
CX1177	CX1177	9
CX1180	CX1180	9
CX1191	CX1191	8
CX1191A	CX1191A	8
CX1191D	CX1191D	8
CX1192	CX1192	9
CX1192B	CX1192B	9
CX1193	CX1193	9
CX1193B	CX1193B	9
CX1199	CX1199	9
CX1199B	CX1199B	9
CX1526/GHT11	CX1526/GHT11	10
CX1527/GHT12	CX1527/GHT12	10
CX1528/GHT8	CX1528/GHT8	10
CX1529/GHT9	CX1529/GHT9	10
CX1530	CX1530	9
CX1530D	CX1530D	9

Type to be replaced	EEV/M-OV replacement	Page no
CY1170J	CY1170J	18
CY1172	CY1172	18
CY4120	CY4120	18
D3a	D3a	20
D13-47GH	D13-47GH	80
D13-47GM	D13-47GM	80
DA42	DA42	12
DA100	DA100	12
DA100B	DA100B	12
DCG4/1000G	GU12	6
DCG4/5000*	AH221	6
	AH238	6
DCG6-18	AH2511	6
DCX4/1000		6
DCX4/5000	GXU2	6
DET16	DET16	12
DET21	DET21	12
DET22	DET22	22
DET22D	DET22D	22
DET22E	DET22E	22
DET22R	DET22R	22
DET22S	DET22S	22
DET23	DET23	22
DET24	DET24	22
DET29	DET29	22
DET29M	DET29M	22
DET40	DET40	12
DET41	DET41	12
DET42	DET42	12
DQ2	GU12	6
DQ4*	AH238	6
DQ4a*	AH221	6
DQ7*	AH205/857B	6
DQ61*	AH2511	6
DR857B*	AH205/857B	6
DX2	GXU1	6
E14-110GM	E14-110GM	80
E36*	FX2517	8
E37B	FX2517	8
E38	FX2517	8
E125A*	C1108	16
E250A*	C1112	16
E280F	E280F	21
E282F	E282F	21
E702A	E702A	74
E702E	E702E	74
E712A	E712A	75
E713B	E713B	74
E714C	E714C	75
E720A	E720A	74
E720B	E720B	74
E720C	E720C	74
E720D	E720D	74
E720E	E720E	74
E724	E724	74
E725	E725	75
E3033	4CX10,000D	17
E3509	M513B	50

Type to be replaced	EEV/M-OV replacement	Page no
ECC230	6080	20
ECS-30*	U30/15/20	26
EE17	5557	7
EHM2S	EHM2S	87
EHT7B	EHT7B	12
EL37	KT66	20
EM15LS	BM25L	46
EN93	6D4	7
EP751	EP751	74
ES105	M5063/2J70B	47
ES1101	DA42	12
ES1102	DA100	12
ESA1500*	BR1126	13
ESU77*	A207	5
ESU103	GXU1	6
ESU150*	AH238	6
ESU200*	AH221	6
ESU866	GU12	6
F13-110GR	F13-110GR	79
F16-10LD	F16-10LD	78
F17-10LD	7ABP33A	78
F21-10LD	F21-10LD	78
F31-10LB*	3077R	78
F31-10LC*	3069R	78
F31-11LC	3069Q	78
	T957Z	78
F31-11LD*	3073Q	78
F31-12LC*	3069R	78
F31-13LC	3069R	78
F575A*	AH2511	6
F857B*	AH205/857B	6
F2004	K3099	45
F8086	E724	74
FG17	5557	7
FG27A*	5559	7
FG33	5559	7
FG57	5559	7
FG81A*	BT89	7
FG98A*	BT89	7
FG235	BK484/5552A	4
FG238B	BK46/5555	4
FG258	BK486/5553B	4
FG259B	BK504/5554	4
FG271	BK448/5551A	4
FTL3-2*	BR1162	13
FTL8-1*	BR1124	13
FTW3-1*	BW1162	14
FX38C-3	XL615/4/3	76
FX42C-3	XL615/7/3	76
FX47A	XL615/13/6.5	76
FX47C-6.5	XL615/13/6.5	76
FX219	8503	8
FX225	FX2505	8
FX227	FX227	8
FX231	8503	8
FX290	8503	8
FX297	FX297	8
FX2503	FX2503	8

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
FX2505	FX2505	8
FX2517	FX2517	8
FX2519A/5949A	FX2519A/5949A	8
FX2530/6777	FX2530/6777	8
G Ozotron	G Ozotron	88
G100A*	AH205/857B	6
G180/2M	QS150/45	23
GCS50/150*	U150/15/40	26
GD75P*	75C1	23
GD85M/S	QS1209/5651	23
GD85PR/S	QS1212	23
GD90M	QS1215	23
GD150M	150C4	23
GD150M/S	0A2	23
GD150P/S	QS1200	23
GHT8	CX1528/GHT8	10
GHT9	CX1529/GHT9	10
GHT11	CX1526/GHT11	10
GHT12	CX1527/GHT12	10
GL4-250A/5D22*	C1112	16
GL4D21/4-125A*	C1108	16
GL57	5559	7
GL415	BK66/5550	4
GL678*	BT95	7
GL857B*	AH205/857B	6
GL5544	BT125	7
GL5545	BT127	7
GL5550	BK66/5550	4
GL5551A	BK448/5551A	4
GL5552A	BK484/5552A	4
GL5553B	BK486/5553B	4
GL5554	BK504/5554	4
GL5555	BK46/5555	4
GL5720	5559	7
GL5822A	BK5822A	4
GL5894*	C178A/5894	16
GL6346*	BK448/5551A	4
GL6347*	BK484/5552A	4
GL6348*	BK486/5553B	4
GL6511*	BK5822A	4
GL6512*	BK504/5554	4
GL6513*	BK46/5555	4
GL7171	BK476	4
GL7207*	BK488	4
GL7669	BK492/7669	4
GL7671	BK494/7671	4
GL7673	BK498/7673	4
GL7681	BK544	4
GL7703	7703	4
Gle15000/1.5/6*	AH238	6
Gle15000/3/12	AH2511	6
GM4	GM4	87
GM4LB	GM4LB	87
GT1C	GT1C	6
GTR95M/S	QS95/10	23
GTR150M/S	QS150/15	23
GU12	GU12	6
GU18	AH238	6

Type to be replaced	EEV/M-OV replacement	Page no
GU20/21*	AH221	6
	AH238	6
GU23*	AH221	6
GU25	GU25	6
GX/SG4/20	GXK20	88
GX/SG4/30	GXK30	88
GX/SG11/80	GXK80	88
GXA Series	GXA Series	88
GXB Series	GXB Series	88
GXC Series	GXC Series	88
GXD Series	GXD Series	88
GXE Series	GXE Series	88
GXF Series	GXF Series	88
GXK Series	GXK Series	88
GXL Series	GXL Series	88
GXM12/1	GXP12	88
GXM15/2	GXN15	88
GXN Series	GXN Series	88
GXO Series	GXO Series	88
GXP Series	GXP Series	88
GXQ Series	GXQ Series	88
GXR Series	GXR Series	88
GXS Series	GXS Series	88
GXU Series	GXU Series	88
GXU1	GXU1	6
GXU2	GXU2	6
GXU3	GXU3	6
GXU4	GXU4	6
GXU5	GXU5	6
GXU6	GXU6	6
GXU30	GXU30	88
GXU50	GXU50	6
GXU51	GXU51	6
GXV Series	GXV Series	88
GXW Series	GXW Series	88
GXX Series	GXX Series	88
H Ozotron	H Ozotron	88
HC1	HC1	17
HK24G*	3C24	12
HS200	7038	65
HS201	7735A	65
HT415*	8503	8
IS1.5V	IS1.5V	86
IS6V	IS6V	86
IS12V	IS12V	86
IS24V	IS24V	86
ITK3-1*	BW1195J3	14
ITK5-1*	BW1196J3	14
ITK8-1*	BW1513J2	14
ITK10-1*	BW1513J2	14
ITK120-1*	BW1186J2	14
J Ozotron	J Ozotron	88
JCS1-50	UF50/10/40	29
JCS1-75	UF75/10/40	29
JCS1-100	UF100/10/40	29
JCS1-150	UF150/10/40	29
JCS1-250	UF250/8/40	29
JCSL-800	UF800/3/50J	29

Type to be replaced	EEV/M-OV replacement	Page no
JCSL-900	UF900/3/50J	29
JF20	BS824	33
JF20D	BS832	33
JP9-2.5D	M599A	50
JP9-2.5E	M599B	50
JP9-2.5F	M599A	50
JP9-2.5H	M5064H	50
JP9-7	2J42	50
JP9-7D	M503A	50
JP9-7L	M5031	50
JP9-7M	M5019	50
JP9-15	M513B	50
JP9-15B	BM1002	50
JP9-18	M598B	50
JP9-22L	M5105	51
JP9-50A	2J55	51
JP9-75	M575	52
JP9-80	4J52A	52
JP9-250	4J50A	52
JP9-250B	M529	52
JP9-250D	M539	52
JP9-250E	M549	52
JP9-250F	M538A	52
K211	K211	45
K300	K300	43
K302	K302	43
K311	K311	43
K324	K324	43
K335	K335	43
K337	K337	43
K342	K342	43
K347	K347A	45
K347A	K347A	45
K351	K351	43
K352	K390	45
K352B	K390	45
K357	K357	43
K359	K359	43
K361	K361	43
K361B	K361B	43
K365	K365	45
K370	K370	45
K371	K371	45
K372	K372	45
K376	K376	45
K377	K377	45
K383	K383	45
K384	K384	45
K385	K385	45
K386	K386	44
K390	K390	45
K391	K391	43
K391A	K391A	43
K3003	K3081	43
K3004	K3004	45
K3005	K3005	45
K3006	K3006	45
K3007	K3007	43

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
K3017	K3217	45
K3018	K3218	45
K3019	K3219	45
K3020	K3091	43
K3020A	K3097	43
K3035	K3035	44
K3038	K3038	44
K3039	K3039	44
K3066	K3066	43
K3069	K3069	43
K3071	K3071	43
K3073	K3073	43
K3074	K3074	43
K3076	K3076	43
K3077	K3077	43
K3078/6975	K3078/6975	43
K3079	K3079	43
K3080	K3080	43
K3081	K3081	43
K3082	K3282	45
K3083	K3283	45
K3084	K3284	45
K3090	K3090	43
K3091	K3091	43
K3094	K3094	43
K3097	K3097	43
K3098	K3098	43
K3099	K3099	45
K3111	K3111	43
K3118	K3118	43
K3217	K3217	45
K3218	K3218	45
K3219	K3219	45
K3282	K3282	45
K3283	K3283	45
K3284	K3284	45
K3382	K3382	45
K3383	K3383	45
K3384	K3384	45
K4001	K4001	45
K4019A	K4019A	45
K4140	K4140	45
K4141	K4141	45
K4142	K4142	45
K4145	K4145	45
K4146	K4146	45
K4147	K4147	45
K4148	K4148	44
K4163	K4163	45
K4164	K4164	45
K4166	K4166	45
K4167	K4167	45
K4168	K4168	45
K4170	K4170	45
K4171	K4171	45
K4172	K4172	45
KS9-30	K3078/6975	43
KS9-40B*	K3091	43
KS9-40D*	K3081	43
KT66	KT66	20
KT88	KT88	20
KU15	FX227	8
KU17	FX2517	8
KU25	8503	8
KU29	6587	8
KU42	FX227	8
KU54*	CX1140	8
KU71*	CX1177	9
KU72*	CX1157	9
KU81	FX2517	8
KU99	FX227	8
KU401	FX2505	8
KU402	8503	8
L63	L63	20
L2060	BS502	42
L2061	BS510	42
L2063	BS386	41
L3156*	M5041	52
L3219	M596	52
L5047	M5109	52
L5191	M5138	52
LB6-10*	N1070	56
LD605	N1055	56
LI218	P874	70
	P875	70
LI221	7389C	70
LI222	7389C	70
LI223	7389C	70
M502	4J50A	52
M503A	M503A	50
M504	M504	52
M505	M505	51
M506	M506A	51
M506A	M506A	51
M513	M513A	50
M513A	M513A	50
M513B	M513B	50
M515	M515	50
M518A	4J31 to 4J35	48
	and 4J53	48
M521	M521	51
M523	M523	52
M525	M525	48
M526	2J42	50
M529	M529	52
M536	4J43 and 4J44	48
M537	M537A	50
M537A	M537A	50
M538	M538A	52
M538A	M538A	52
M539	M539	52
M540B	M540B	50
M542	5586	48
M543	7182	48
M549	M549	52
M551	4J52A	52
M554	M554	46
M559	8356	50
M561	M561	47
M565	M565	46
M566	M566	48
M569	M569	48
M570	M570	48
M573	M573	48
M574	M574	48
M575	M575	52
M577	M577B	48
M577A	M577B	48
M577B	M577B	48
M578	M578B	48
M578A	M578B	48
M578B	M578B	48
M579	M579	48
M581	M581	52
M586	M586	46
M591B	BM1002	50
M592	M592	52
M595	M595B	48
M595B	M595B	48
M596	M596	52
M597	M597	50
M598B	M598B	50
M599A	M599A	50
M599B	M599B	50
M1222	4J34	48
M1224	4J32	48
M1225	4J31	48
M1226	4J31	48
M4011	M4011	48
M4016	M4016	46
M4017	M4017	48
M4121	M4121	46
M4122	M4122	46
M4503B	BS914	35
M4505E	M5142	51
M4527E	M5065	50
M5005	M5005	51
M5005A	M5005A	51
M5008	M5032	49
M5009	M5033	49
M5015	M5125	47
M5019	M5019	50
M5020	M5020	47
M5021	M5021	50
M5022	M5022	50
M5023	M5023	50
M5024	M5024	50
M5025	M5025	50
M5028	M5028	47
M5030	M5030A	48
M5030A	M5030A	48
M5031	M5031	50
M5032	M5032	49
M5033	M5033	49

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
M5034	M5034A	48
M5034A	M5034A	48
M5035	M5035	48
M5039	M5039	50
M5041	M5041	52
M5042	M5042S	52
M5042S	M5042S	52
M5043	M5043	50
M5044	M5044	50
M5048	M5048	48
M5051	M5051	46
M5052	M5052	46
M5053	M5053	53
M5054	M5054	53
M5055	M5055	53
M5057	M5057	53
M5058	M5125	47
M5059	M5059	53
M5060	M5060	53
M5061	M5061	51
M5062	M5062	51
M5063/2J70B	M5063/2J70B	47
M5064H	M5064H	50
M5065	M5065	50
M5067	M5067	50
M5067H	M5067H	50
M5068	M5068	50
M5075	M5075	51
M5076	M5076	51
M5077	M5077	51
M5079A	M5079A	48
M5080	M5080	52
M5081	M5081	52
M5083	M5083A	48
M5083A	M5083A	48
M5084	M5084	46
M5085	M5085	46
M5086	M5086	46
M5087	M5087	46
M5089	M5089	50
M5091	M5091A	48
M5091A	M5091A	48
M5094	M5094	48
M5097	M5097	50
M5100	M5100	53
M5101	M5101	52
M5103	M5125	47
M5105	M5105	51
M5108	M5108	50
M5109	M5109	52
M5110	M5125	47
M5111	M5111	50
M5113	M5113	48
M5114B	M5114B	48
M5115	M5115	50
M5117 Series	M5117 Series	50
M5118	M5118	52
M5119	M5119	52

Type to be replaced	EEV/M-OV replacement	Page no
M5123	M5123	53
M5124	M5124	53
M5125	M5125	47
M5126A	M5126A	48
M5127	M5127	53
M5133	M5133	48
M5134	M5134	48
M5135	M5135	48
M5136	M5136	48
M5137	M5137	53
M5138	M5138	52
M5142	M5142	51
M7050	P874	70
	P875	70
M7091S	P874	70
	P875	70
M7092	P874	70
	P875	70
M8098	QS1212	23
M8142	QS1213	23
M8223	0A2WA	23
M8224	0B2WA	23
MA52	MA52	26
MA54	MA54	26
MA100	MA100	27
MA125	MA125	26
MA126	MA126	26
MA164	MA164	26
MA281	MA281	26
MA282	MA282	29
MA296	MA296	26
MA338/7381	BS918	35
MA355A	BS912	32
MA387	BS952	36
MA3167A	BS452	35
MA3846X	BS830	37
MA3920X	BS206	36
MA3993	BS206	36
MAG3	2J42	50
MAG11	M506A	51
MAG12	MAG12	49
MAG15	MAG15	49
MAG16	M5022	50
MAG17	MAG17	49
MAG19	MAG19	52
MAG20	MAG20	49
MAG21A	MAG21A	49
MAG21B	MAG21B	49
MAG21C	MAG21C	49
MAG22	MAG22	49
MAG23A	MAG23A	49
MAG23B	MAG23B	49
MAG23C	MAG23C	49
MAG23D	MAG23D	49
MC567*	M554	46
MCF1145	M5080	52
MD80X54	BS206	36
MD2901	BS452	35

Type to be replaced	EEV/M-OV replacement	Page no
MD5901	BS958	36
ME1001	DET22	22
ME1005	DET23	22
ME1101	2J42	50
ME1101D	M503A	50
ME1503	FX2505	8
ME1504	5559	7
ME1505	5557	7
MF31-55	MF31-55	78
MF41-10	MF41-10	78
ML857B*	AH205/857B	6
ML5894*	C178A/5894	16
ML6198	7735A	65
ML6421*	BR1124	13
MT17	5557	7
MT57	5559	7
MT5544	BT125	7
MT5545	BT127	7
MT5557	5557	7
MT5559	5559	7
MX20	3069M	78
MXT92	BS192	35
MY3-275	V1505	12
MZ1/100	DA100	12
N1010A	N1010A	58
N1010S	N1010S	58
N1016M	N1016M	54
N1017M	N1017M	54
N1022M	6861	54
N1029	N1029	56
N1033	N1033	55
N1034A	N1034A	58
N1034S	N1034S	58
N1038	N1038	57
N1042M	N1042M	54
N1045M	N1045M	54
N1047M	N1047M	54
N1055	N1055	56
N1056	N1056	55
N1061	N1061	58
N1065	N1065	58
N1067	BS386	41
N1070	N1070	56
N1071	N1071	57
N1072	N1072	56
N1073	N1073	55
N1073Z	N1073Z	55
N1074	N1073	55
N1075	N1075	58
N1077	N1077	58
N1078	N1078	58
N1079	N1079	58
N1080	N1080	58
N1081	N1081	58
N1082	N1082	58
N1083	N1083	58
N1085	N1072	56
N1086	N1086	55

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
N1093	N1093	57
N1094	N1094	57
N1095	N1095	57
N4001	N4001	54
N4003	N4003	54
N4004	N4004	54
N4006	N4006	55
N4041	N4041	54
N4047	N4047	56
N4051	N4051	57
N4074	N4074	55
N4075	N4075	55
N4085	N4085	56
N4094	N4094	56
N4115	N4115	58
N4132	N4132	56
N4134	N4134	57
N4135	N4135	56
N4136	N4136	55
N4173	N4173	57
N4174	N4174	55
N10000	N10000	57
N10001	N10001	56
N10002	N10002	55
N10003	N10003	56
N10004	N10004	55
N10007	N10007	57
N10009	N10009	56
N10010	N10010	55
NFT1	NFT1	89
NFT2	NFT2	89
NFT3	NFT3	89
NFT4	NFT4	89
NFT5	NFT5	89
NFT6	NFT6	89
NFT7	NFT7	89
NFT8	NFT8	89
NFT9	NFT9	89
NFT10	NFT10	89
NL715	5557	7
NL734	BT125	7
NL740*	BT125	7
NL760	BT127	7
NL1009A	BK544	4
NL1022A	BK5822A	4
NL1036	BK476	4
NL1037	7703	4
NL1039	7703	4
NL1051A	BK448/5551A	4
NL1052A	BK484/5552A	4
NL1053A	BK482	4
NL1059*	BK488	4
NL1061	BK492/7669	4
NL1062	BK494/7671	4
NL1063	BK500	4
NL1081	BK502	4
NL1082	BK544	4
NL2408*	BK492/7669	4

Type to be replaced	EEV/M-OV replacement	Page no
NL5550	BK66/5550	4
NL5553B	BK486/5553B	4
NL7171	BK476	4
NL7673	BK498/7673	4
NL7703	7703	4
NLC6J*	BT127	7
NLC6J-K*	BT127	7
NU829*	C178A/5894	16
NV1941	BS834	32
NV1942	BS840	32
NV2441	BS838	32
NV2445	BS836	32
OA2	0A2	23
OA2WA	0A2WA	23
OB2	0B2	23
OB2WA	0B2WA	23
OC2	0C2	23
OG3	QS1209/5651	23
OS20F	P874	70
OS20H	P874	70
OS20M	P882	70
OS40F	P875	70
OS40H	P875	70
OS40M	P883	70
P535/1E*	C1150/1	16
P552/1E*	C1150/1	16
P807	P874	70
P807/E	P874	70
P810	7735A	65
P811	7295C	70
P811/E	7295C	70
P813	7038	65
P816*	P874	70
	P875	70
P816/E*	P874	70
	P875	70
P820	7038	65
P822	7389C	70
P822/E	7389C	70
P826	P826/4478	65
P826/4478	P826/4478	65
P831	P831	67
P841	8507A	66
P841X	P841X	66
P842	8541A	66
P842X	P842X	66
P843	8572A	66
P844	P844	66
P846	8625	66
P847	8626	66
P848	8507	66
P848D	P848D	66
P849	8541	66
P849D	P849D	66
P850	P850	71
P851	P875	70
P851/4415	P875	70
P855	P855	73

Type to be replaced	EEV/M-OV replacement	Page no
P856	P856	73
P858	P858	70
P862*	P849D	66
P863	P863	67
P866	P866	66
P872	P872	70
P873	P873	70
P874	P874	70
P875	P875	70
P880	P880	71
P882	P882	70
P883	P883	70
P887	P887	71
P893/4493	P893/4493	67
P894/4494	P894/4494	67
P895/4495	P895/4495	67
P896A	P896A	72
P4150	P4150	71
P8000 Series	P800 Series	64
P8001 Series	P8001 Series	64
P8003 Series	P8003 Series	64
P8005 Series	P8005 Series	64
P8008 Series	P8008 Series	64
P8018A	P8018A	67
P8018B	P8018B	67
P8021 Series	P8021 Series	64
P8022 Series	P8022 Series	64
P8023 Series	P8023 Series	64
P8024 Series	P8024 Series	64
P8031	P8031	66
P8034	P8034	65
P8034A	P8034A	66
P8038	P8038	66
P8038B	P8038B	66
P8040	P8040	71
P8041	P8041	71
P8076A	P8076A	72
P8090	P8090	68
P8095	P8095	72
P8096	P8096	72
P8101	P8101	73
P8102	P8102	73
P8103	P8103	73
P8104	P8104	73
P8130 Series	P8130 Series	65
P8131 Series	P8131 Series	65
P8132 Series	P8132 Series	65
P8133 Series	P8133 Series	65
P8141 Series	P8141 Series	65
P8142 Series	P8142 Series	65
P8143 Series	P8143 Series	65
P8144 Series	P8144 Series	65
P8201	P8201	67
PE130A*	3C24	12
PL4D21*	C1108	16
PL5C22/HT415	8503	8
PL5D22*	C1112	16
PL17	5557	7

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
PL57	5559	7
PL165A	FX2505	8
PL174	6587	8
PL255*	BT29	7
PL345	FX227	8
PL435	FX2505	8
PL522	8503	8
PL2052A	BK484/5552A	4
PL5544	BT125	7
PL5545	BT127	7
PL5551A	BK448/5551A	4
PL5552A	BK484/5552A	4
PL5553B	BK486/5553B	4
PL5555	BK46/5555	4
PL5557	5557	7
PL5559	5559	7
PL5684	ZT1011	7
PL5822A	BK5822A	4
PMC5	PMC5	56
PMC14	PMC14	56
PMDM3	BS512	42
Q160-1*	C1108	16
Q400-1*	C1112	16
Q450-1*	C1136	16
QB3/300	C1108	16
QB3.5/750	C1112	16
QB4-1100	C1136	16
QBL5-3500	ACS4	17
QEL1/150	4CX250B	17
QF34	BS894	33
QF37	BS894	33
QF41	BS810	35
QF41M	BS462	35
QF45	BS810	35
QF401	BS888	38
QF451	BS810	35
QF451L	BS908	37
QF451M	BS462	35
QF451P	BS822	35
QKH1535	M5039	50
QQE03/20	C1134	16
QQE06/40	C178A/5894	16
QQV03-20A	C1134	16
QQV03-20B	C1534	16
QQV06-40A	C178A/5894	16
QS75/20	QS75/20	23
QS75/60	QS75/60	23
QS83/3	QS1209/5651	23
QS95/10	QS95/10	23
QS108/45	QS108/45	23
QS150/15	QS150/15	23
QS150/45	QS150/45	23
QS1200	QS1200	23
QS1203	QS1203	23
QS1207	0A2	23
QS1208	0B2	23
QS1209	QS1209/5651	23
QS1209/5651	QS1209/5651	23

Type to be replaced	EEV/M-OV replacement	Page no
QS1210	0A2WA	23
QS1211	0B2WA	23
QS1212	QS1212	23
QS1213	QS1213	23
QS1215	QS1215	23
QSC5	QSC5	24
QV1-150A	4CX250B	17
QV2-250B	4CX250B	17
QV2-250C	4CX250B	17
QV20-P18*	C1149/1	16
QV20-P18B*	C1149/1	16
QY3-125	C1108	16
QY4-250	C1112	16
QY4-400	C1136	16
QY5-3000A	ACS4	17
R1130B	1B59	75
R1169	XL601	75
RC1	RC1	86
RCH	RCH	86
RCX	RCX	86
RCY	RCY	86
RCZ	RCZ	86
RE125C*	C1108	16
RE400C*	C1136	16
RG3-250A	GU12	6
RG3-1250	AH238	6
RG4-1250	AH221	6
RG4-3000	AH2511	6
RK4D32	4D32	16
RK6043	K3067	†
RL2G	RL2G	84
RL2GA	RL2GA	84
RL16	RL16	84
RL17	5557	7
RL57	5559	7
RR3-250	GXU1	6
RR3-1250	GXU2	6
RR3-1250A	GXU3	6
RR3-1250B	GXU4	6
RS520*	BW1124	14
RS635*	B1153	12
RS683*	C1108	16
RS685*	C1108	16
RS686*	C1136	16
RS726*	BR1161	13
RS822*	BY189A	15
	BY1102	15
RS826	BY1161	15
RS833*	BY1122	15
RS1001L*	BR1122	13
RS1002A	C1136	16
RS1007*	C1108	16
RS1009*	C178A/5894	16
RS1019*	C1134	16
RS1036	B1152	12
RS1046	B1153	12
RS2002V	CY1172	18
RS2016	4CX5000A	17

Type to be replaced	EEV/M-OV replacement	Page no
RS2793	4CX5000A	17
RS2794*	4CX10,000D	17
RS4791	4CX1000A	17
S130P	S130P	23
SAL89	K3099	45
SAS*	BK472	4
SC1/350	SC1/350	24
SC1/400	SC1/400	24
SC1/500	SC1/500	24
SC1/600	SC1/600	24
SC1/800	SC1/800	24
SC1/1000	SC1/1000	24
SC1/1200	SC1/1200	24
SC1/1400	SC1/1400	24
SC1/1600	SC1/1600	24
SC1/1800	SC1/1800	24
SC1/2000	SC1/2000	24
SC2/2500	SC2/2500	24
SC2/3000	SC2/3000	24
SC2/3500	SC2/3500	24
SC2/4000	SC2/4000	24
SC5/5000	SC5/5000	24
SC5/6000	SC5/6000	24
SC5/6800	SC5/6800	24
SC6/5000	SC6/5000	24
SC6/7000	SC6/7000	24
SC6/10000	SC6/10000	24
SC6/14000	SC6/14000	24
SC7/12000	SC7/12000	24
SC7/14000	SC7/14000	24
SC7/15000	SC7/15000	24
SC7/16000	SC7/16000	24
SC7/E	SC7/E	24
SD6000	SD6000	87
SD15000	SD15000	87
SD15000A	SD15000A	87
SEC*	BK496	4
SGR1	FX2505	8
SMS6	SMS6	55
SMS7	SMS7	55
SMX16	SMX16	57
SRS455	C1108	16
SRS456	C1136	16
SRS4451*	C178A/5894	16
SRS4452	C1134	16
SRU4438	K3080	43
SRV355*	BY1161	15
Ste1000/2.5/15	5559	7
Ste2000/6/80	BT127	7
Ste2500/05/2	5557	7
StR85/10*	QS1209/5651	23
StR108/30*	0B2	23
StR150/30*	0A2	23
STV85/10	QS1209/5651	23
STV108/30	0B2	23
STV150/30	0A2	23
SZ50	K351	43
SZ52A	K3079	43

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
SZ53	K351	43
T149*	BT17	7
T924Z	MF31-55	78
T935W	AW36-48	79
T940B	T940B	79
T940G	T940G	79
T940R	T940R	79
T940W	T940W	79
T957Y	T957Y	78
T957Z	T957Z	78
T963Z	T963Z	78
T964Y	F21-10LD	78
T965Z*	3069R	78
T974Z*	3069R	78
T977Z*	T989Z	78
T983S	T983S	78
T983Z	T983Z	78
T986Z	3069R	78
T988S	T988S	78
T988Z	T988Z	78
T989S	T989S	78
T989Z	T989Z	78
T9017W	T9017W	78
TB3/750*	DET40	12
TB4/1500	B1152	12
TB5/2500	B1153	12
TBH7/8000	BW1162J3	14
TBL6/6000	BR1165	13
TBL6/6000B	BR1160	13
TBL7/8000	BR1162	13
TBL7/9000*	BR1196	13
TBW6/6000	BW1165	14
TBW7/8000	BW1162	14
TD03/10	DET22	22
TD03/10D	DET22D	22
TD03/10E	DET22E	22
TD04/20	DET24	22
TD25	C178A/5894	16
TG200	FX2505	8
TG1000	8503	8
TGL9477	C1108	16
TGL9481	C1134	16
TGL9482	C178A/5894	16
TH3B24W	3B24W	5
TH4J50A	4J50A	52
TH4J52A	4J52A	52
TH554*	BW1186J2	14
TH1586	5586	48
TH1657	5657	48
TH3060B*	M5125	47
TH5021B	GU12	6
TH5221B	GXU1	6
TH5586	5586	48
TH5657	5657	48
TH6011	5557	7
TH6031	5559	7
TH6120*	BT17	7
TH6220	BT127	7

Type to be replaced	EEV/M-OV replacement	Page no
TH6220A	BT127	7
TH6435	FX2505	8
TH6522	8503	8
TH7010	BK66/5550	4
TH7020	BK448/5551A	4
TH7021*	BK448/5551A	4
TH7023	BK448/5551A	4
TH7030	BK484/5552A	4
TH7031*	BK484/5552A	4
TH7033	BK484/5552A	4
TH7036	BK544	4
TH7037	BK484/5552A	4
TH7040	BK486/5553B	4
TH7041*	BK486/5553B	4
TH7043	BK486/5553B	4
TH7047	BK486/5553B	4
TH7050	7703	4
TH7051	7703	4
TH9700	P875	70
TH9701	P874	70
TH9801	P849D	66
TH9804	7038	65
TH9806PA	8541	66
TH9807PA	P844	66
	8541A	66
TH9808PA	P849D	66
TH9810	P849D	66
TH9812PA	P842X	66
TH9813	8134V1/4811	67
TH9814PA	P831	67
TH9815PA	P842X	66
TH9817PA	8626	66
TH9818PA	P842X	66
TH9831*	8480V1/4810	68
TL6011	ZT1011	7
TQ1/2*	ZT1011	7
TQ2*	5557	7
TQ2/3	BT125	7
TQ2/61	BT127	7
TRN1	BS702	32
TRN2	BS710	32
TRN3	BS710	32
TRP3	BS716	32
TRP4	BS718	32
TRP5	BS720	32
TRP8	BS724 Series	32
TRP10	BS732	32
TRP14	BS714	32
TRW1	BS800	33
TT16D	C1108	16
TT17	5557	7
TT20	C1134	16
TT21	TT21	16
TT22	TT22	16
TT25*	C178A/5894	16
TT100	TT100	16
TTR31MR	BS822	35
TV1542	M5125X	†

Type to be replaced	EEV/M-OV replacement	Page no
TV2255	P8031	66
TV2350*	K3071	43
TV3304A	BS170	33
TV8000	8541A	66
TV8050	P866	66
TV8162	8051	68
TV9300	P844	66
TWC5	TWC5	56
TWC5A	TWC5A	56
TWC5B	TWC5B	56
TWC5C	TWC5C	56
TWC14	TWC14	56
TWC14A	TWC14A	56
TWC14B	TWC14B	56
TWC14C	TWC14C	56
TWC18	TWC18	54
TWC35	TWC35	56
TWC35A	TWC35A	56
TWC35B	TWC35B	56
TWC35C	TWC35C	56
TWC37	TWC37	56
TWC37A	TWC37A	56
TWC37B	TWC37B	56
TWC37C	TWC37C	56
TWJ30	TWJ30	54
TWS6	TWS6	55
TWS7	TWS7	55
TWS10/7642	TWS10/7642	55
TWS12	TWS12	55
TWS17	TWS17	54
TWS24	TWS24	55
TWS25	TWS25	55
TWS36	TWS36	55
TWX8	TWX8	57
TWX16	TWX16	57
TWX19	TWX19	54
TWX22	TWX22	57
TWX34	TWX34	57
TX12-12W*	BW140	14
TX920	5559	7
TY5-500	B1152	12
TY6-800	B1153	12
TY6-3000A	BR1126	13
TY6-5000A	BR1165	13
TY6-5000B	BR1160	13
TY6-5000W	BW1165	14
TY7-6000A	BR1162	13
TY7-6000H	BW1162J3	14
TY7-6000W	BW1162	14
TY8-6000A*	BR1196	13
U6/15/7F	UF6/15/7	29
U10/15/7F	UF10/15/7J	29
U19	U19	5
U23	U19	5
U30/15	U30/15/20	26
U30/15/20	U30/15/20	26
U50/15	U50/15/30	26
U50/15/30	U50/15/30	26

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
U50/20/40	U50/20/40	26
U60/30/75	U60/30/75	26
U75/15/40	U75/15/40	26
U80/15	U80/15/40	26
U80/15/40	U80/15/40	26
U90/15/40	U90/15/40	26
U100/20/40	U100/20/40	26
U100/25/75	U100/25/75	26
U150/15/40	U150/15/40	26
U150/25/75	U150/25/75	26
U200/10/40	U200/10/40	26
U200/15/40	U200/15/40	26
U200/15/40A	U200/15/40A	26
U200/20/75	U200/20/75	26
U250/15/75J	U250/15/75J	26
U300/10/40	U300/10/40	26
U300/15/40	U300/15/40	26
U300/20/75	U300/20/75	26
U300/20/75A	U300/20/75A	26
U400/10/40	U400/10/40	26
U400/10/40A	U400/10/40A	26
U500/3/40J	U500/3/40J	26
U500/5/40J	U500/5/40J	26
U500/10/40	U500/10/40	26
U500/10/40A	U500/10/40A	26
U500/15/75	U500/15/75	26
U500/15/75A	U500/15/75A	26
U500A/15/75J	U500A/15/75J	26
U600/8/40	U600/8/40	26
U650/3/40	U650/3/40	26
U750/10/40	U750/10/40	26
U750/10/40A	U750/10/40A	26
U750/10/75J	U750/10/75J	26
U750/15/75	U750/15/75	26
U1000/3	U1000/3/40	26
U1000/3/40	U1000/3/40	26
U1000/3/40A	U1000/3/40A	26
U1000/3/40C	U1000/3/40C	26
U1000/3M	U1000/3/40A	26
U1000/10/75J	U1000/10/75J	27
U1000A/3/40J	U1000A/3/40J	27
U1000A/3/40JA	U1000A/3/40JA	27
U1000A/3/40JB	U1000A/3/40JB	27
U1000A/3/40JD	U1000A/3/40JD	27
U1000A/10/75J	U1000A/10/75J	27
U1000B/10/75	U1000B/10/75	27
U1200/10/75J	U1200/10/75J	27
U1500/8/75	U1500/8/75	27
U2000/2	U2000/3/40	27
U2000/2P	U2000/3/40B	27
U2000/3	U2000/3/40	27
U2000/3A	U2000/3/40A	27
U2000/3/40	U2000/3/40	27
U2000/3/40A	U2000/3/40A	27
U2000/3/40B	U2000/3/40B	27
U2000/3/40C	U2000/3/40C	27
U2000/3P	U2000/3/40B	27
U2000/8/75J	U2000/8/75J	27

Type to be replaced	EEV/M-OV replacement	Page no
U2000/8/75JA	U2000/8/75JA	27
U2000A/8/75	U2000A/8/75	27
U2000A/8/75A	U2000A/8/75A	27
U3000/3/40J	U3000/3/40J	27
U4000/2/40	U4000/2/40	27
UA025A	GXU1	6
UA75/15/40	U75/15/40	26
UA200/10/40	U200/10/40	26
UA300/10/40	U300/10/40	26
UB50/20/40	U50/20/40	26
UB150/15/40	U150/15/40	26
UB400/10/40	U400/10/40	26
UB400/10/40A	U400/10/40A	26
UC200/15/70	UC200/15/70	28
UC250/20/125	UC250/20/125	28
UC250/25/125J	UC250/25/125J	28
UC250/30/150J	UC250/30/150J	28
UC250/30/150JA	UC250/30/150JA	28
UC250/30/150JD	UC250/30/150JD	28
UC300/10/70J	UC300/10/70J	28
UC450/30/150J	UC450/30/150J	28
UC450A/30/150	UC450A/30/150	28
UC650/30/150J	UC650/30/150J	28
UC750/20/150J	UC750/20/150J	28
UC880/15/125	UC880/15/125	28
UC1000/8/125J	UC1000/8/125J	28
UC1000/10/125J	UC1000/10/125J	28
UC1000/15/125	UC1000/15/125	28
UC1000/20/150J	UC1000/20/150J	28
UC1000A/20/150	UC1000A/20/150	28
UC1500/8/125J	UC1500/8/125J	28
UC1500/10/125J	UC1500/10/125J	28
UC1500/20/150J	UC1500/20/150J	28
UC2300/8/125J	UC2300/8/125J	28
UC2300/10/125J	UC2300/10/125J	28
UC2500/5/60J	UC2500/5/60J	28
UCM500/5/25	UCM500/5/25	28
UCM500A/5/25	UCM500A/5/25	28
UCM2000/5/40	UCM2000/5/40	28
UCM2000A/5/40	UCM2000A/5/40	28
UCS5-200*	U200/10/40	26
	U200/15/40	26
UCS10-300*	U300/10/40	26
	U300/15/40	26
UCS10-400	U400/10/40	26
UCSF500	U500/10/40A	26
UCSL1000	U1000A/3/40JB	27
	U1000A/3/40JD	27
UCSL1000 special	U1000A/3/40J	27
	U1000A/3/40JA	27
UCSL2000	U2000/3/40	27
UCSL3000	U3000/3/40J	27
UCSX700*	U750/10/40	26
UCSX1000	U1000/10/75J	27
UCSXF750	U750/10/75J	26
UCSXF1000	U1000A/10/75J	27
UCSXF1200	U1200/10/75J	27
UCSXF1500*	U1500/8/75	27

Type to be replaced	EEV/M-OV replacement	Page no
UCSXF2000	U2000/8/75J	27
	U2000/8/75JA	27
UCW1000/30/500	UCW1000/30/500	29
UD100/20/40	U100/20/40	26
UD200/15/40	U200/15/40	26
UD500/10/40	U500/10/40	26
UD500/10/40A	U500/10/40A	26
UE300/15/40	U300/15/40	26
UE750/10/40	U750/10/40	26
UE966	GU12	6
UE967	5557	7
UF6/15/7	UF6/15/7	29
UF10/15/7J	UF10/15/7J	29
UF12/20/40	UF12/20/40	29
UF25/20/40	UF25/20/40	29
UF50/10/40	UF50/10/40	29
UF50/20/40	UF50/20/40	29
UF75/10/40	UF75/10/40	29
UF100/10/40	UF100/10/40	29
UF150/10/40	UF150/10/40	29
UF250/8/40	UF250/8/40	29
UF300/10/50	UF300/10/50	29
UF300/15/75	UF300/15/75	29
UF500/10/50	UF500/10/50	29
UF750/8/75	UF750/8/75	29
UF800/3/50J	UF800/3/50J	29
UF900/3/50J	UF900/3/50J	29
UF1000/8/75	UF1000/8/75	29
UFC6/30/140J	UFC6/30/140J	30
UFC12/30/140J	UFC12/30/140J	30
UFC18/30/140J	UFC18/30/140J	30
UFC34/30/140J	UFC34/30/140J	30
UFC40/30/140J	UFC40/30/140J	30
UFC50/30/140J	UFC50/30/140J	30
UFC100/15/80	UFC100/15/80	30
UFC100/15/140	UFC100/15/140	30
UFC100/30/120J	UFC100/30/120J	30
UFC150/15/140	UFC150/15/140	30
UFC450/12/125J	UFC450/12/125J	30
UFC450/15/125J	UFC450/15/125J	30
UFC500/12/125J	UFC500/12/125J	30
UFC500/15/125J	UFC500/15/125J	30
UFC750/15/125	UFC750/15/125	30
UFC1000/15/125	UFC1000/15/125	30
UFC1000/20/200	UFC1000/20/200	30
UFC1000/30/200J	UFC1000/30/200J	30
UFC1000A/12/125J	UFC1000A/12/125J	30
UFC1000A/15/125J	UFC1000A/15/125J	30
UFC1500/12/125	UFC1500/12/125	30
UFC2000/8/125J	UFC2000/8/125J	30
UFC2000/20/200J	UFC2000/20/200J	30
UFC3000/7/125	UFC3000/7/125	30
UG60/30/75	U60/30/75	26
UG100/25/75	U100/25/75	26
UG200/20/75	U200/20/75	26
UG500/15/75	U500/15/75	26

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
UG1000/10/75	U1000B10/75	27
UH150/25/75	U150/25/75	26
UH300/20/75	U300/20/75	26
UH750/15/75	U750/15/75	26
UH1500/8/75	U1500/8/75	27
UH2000/8/75	U2000A/8/75	27
UH2000/8/75A	U2000A/8/75A	27
UJ750/5-24	U750/5-20/40J	†
UJ1000/3	U1000A/3/40J	27
UJ1000/3A	U1000A/3/40JA	27
UJ1000/3B	U1000A/3/40JB	27
UJA500/5	U500/5/40J	26
UJB3000/3	U3000/3/40J	27
UKC450/30/150	UC450/30/150J	28
USL500	U500/5/40J	26
UXCF250	U250/15/75J	26
UXCF500	U500A/15/75J	26
V1505	V1505	12
VA201B	K351	43
VA203B/6975	K3078/6975	43
VA210P	K3073	43
VA218B	K3069	43
VA259	K3114	†
VA508	K3071	43
VCCA12	UF12/20/40	29
VCCA25	UF25/20/40	29
VCCA50	UF50/20/40	29
VDX1014	BS952	36
VDX1047	BS206	36
VE966A	GU12	6
VH550A	GU12	6
VMMHC250*	UC250/30/150JA	28
	UC250/30/150JD	28
VMMHC450*	UC450A/30/150	28
VMMHC1000*	UC1000A/20/150	28
VMX-1027	M5138	52
VOS20K	P874	70
VOS20M	P882	70
VOS25H	7389C	70
VOS25M	P872	70
VOS40K	P875	70
VOS40M	P883	70
VOS50H	7295C	70
VOS50M	P873	70
VQ1	VQ1	89
VQ2	VQ2	89
VQ3	VQ3	89
VQ4	VQ4	89
VQ6	VQ6	89
VT46	GU12	6
VT46A	GU12	6
VT123	5586	48
VVC50-42-20*	U50/20/40	26
VVC100-42-20*	U100/20/40	26
VVC200-42-7.5	U200/10/40	26
VVC200-42-15*	U200/15/40	26
VVC300-42-7.5*	U300/10/40	26
VVC300-42-15*	U300/15/40	26
VVC400-42-7.5*	U400/10/40	26
VVC500-42-10*	U500/10/40	26
VX580A	GXU1	6
WF42	BS200	35
WF43	BS202	35
WF45	BS914	35
WF49A	BS194	34
WF402	BS158	35
WF402L	BS816	37
WF403	BS156	35
WF404L	BS814	37
WF405L	BS818	37
WF407L	BS814	37
WF409	BS452	35
WF412L	BS826	37
WF415	BS440	35
WGC405H	WGC405H	61
WGC1100	WGC1100	62
WGC2100	WGC2100	62
WGC2200	WGC2200	62
WGC3100	WGC3100	62
WGC4050	WGC4050	61
WGC4100	WGC4100	62
WGC4200	WGC4200	62
WGC4300	WGC4300	62
WGI6100	WGI6100	60
WGI7100	WGI7100	60
WGI8050	WGI8050	60
WGI9020	WGI9020	60
WGI9050	WGI9050	60
WJ367	N10007	57
WL5D22*	C1112	16
WL575A*	AH2511	6
WL624*	BT17	7
WL632B*	5559	7
WL651	BK484/5552A	4
WL652	BK448/5551A	4
WL655	BK486/5553B	4
WL656	BK484/5552A	4
WL657	BK448/5551A	4
WL658	BK486/5553B	4
WL681	BK66/5550	4
WL857B*	AH205/857B	6
WL866A	GU12	6
WL5550	BK66/5550	4
WL5551A	BK448/5551A	4
WL5552A	BK484/5552A	4
WL5553B	BK486/5553B	4
WL5559	5559	7
WL5822A	BK5822A	4
WL7669	BK492/7669	4
WL7671	BK494/7671	4
WL7673	BK498/7673	4
WL7681	BK544	4
WT210-0008	GU12	6
WT210-0051	0A2	23
WT210-0056	5559	7
WT210-0070	BK66/5550	4
WT210-0071	BK448/5551A	4
WT210-0072	BK484/5552A	4
WT210-0073	BK486/5553B	4
WT210-0147	BK484/5552A	4
WT210-0149	BK448/5551A	4
WT210-0152	BK486/5553B	4
WT210-0158	BK448/5551A	4
WT210-0159	BK484/5552A	4
WT210-0165	BK486/5553B	4
WT210-0170	BK5822A	4
WT210-0246	BK544	4
WT210-0249	BK448/5551A	4
WT210-0252	BK484/5552A	4
WT210-0274	BK492/7669	4
WT210-0275	BK494/7671	4
WT210-0282	BK500	4
WT210-0285	BK494/7671	4
WT210-0290	BK492/7669	4
WT210-0306	BK482	4
WT262	GU12	6
WTC5	WTC5	62
WTJ9	WTJ9	62
WTS4	WTS4	62
WTT111	5559	7
WTT117	5557	7
WTX6	WTX6	62
WTX8	WTX8	62
X-6.25	UF6/15/7	29
X-10	UF10/15/7J	29
X1100	N1029	56
XA1	XA1	87
XE1-3	XL615/4/3	76
XG1-2500	5559	7
XG2-12*	BT29	7
XG2-500	BT19	7
XG2-6400*	BT17	7
XG5-500	5557	7
XG15-12	BT69	7
XH3-045	FX227	8
XH8-100	FX2505	8
XH16-200	8503	8
XH25-500	FX2519A/5949A	8
XL601	XL601	75
XL603	XL603	75
XL604	XL615/10/5.5	76
XL605	XL615/10/6.5	76
XL606	XL615/13/6.5	76
XL608	XL615/9/4	76
XL611	XL615/7/3	76
XL615 Series	XL615 Series	76
XL627	XL627	75
XL631	XL631	75
XL632	XL632	75
XL635	XL635	75
XL639 Series	XL639 Series	76
XL641	XL641	75
XQ1003*	P849D	66
XQ1004*	8541	66

* † Please refer to page 91.

Type to be replaced	EEV/M-OV replacement	Page no
XQ1007	P849D	66
XQ1008	8541	66
XQ1020*	P8001	64
XQ1020B*	P8001B	64
XQ1020G*	P8001G	64
XQ1020L*	P8001L	64
XQ1020R*	P8001R	64
XQ1021*	P8001 IG	64
XQ1021B*	P8001B IG	64
XQ1021G*	P8001G IG	64
XQ1021R*	P8001R IG	64
XQ1022*	P8001X	64
XQ1023	P8003AM	64
XQ1023G	P8003AG	64
XQ1023L	P8003AL	64
XQ1023R	P8003AR	64
XQ1025	P8003MF	64
XQ1025G	P8003GF	64
XQ1025L	P8003LF	64
XQ1025R	P8003RF	64
XQ1030*	7262A	65
XQ1031*	7262A	65
XQ1040	P844	66
XQ1041	P842X	66
XQ1042	8541A	66
XQ1043	8541	66
XQ1044	P849D	66
XQ1050*	8572A	66
XQ1052*	8507A	66
XQ1053	P8031	66
XQ1054	P8031	66
XQ1060*	P842X	66
XQ1061*	8541A	66
XQ1062	P8031	66
XQ1063	P8031	66
XQ1064	P8031	66
XQ1065*	P844	66
XQ1066	P8031F	66
XQ1067	P8031F	66
XQ1070	P8021	64
XQ1070B	P8021B	64
XQ1070G	P8021G	64
XQ1070L	P8021L	64

Type to be replaced	EEV/M-OV replacement	Page no
XQ1070R	P8021R	64
XQ1073	P8023A	64
XQ1073R	P8023AR	64
XQ1075	P8023F	64
XQ1075R	P8023RF	64
XQ1120*	8134V1/4811	67
XQ1121*	8134	67
XQ1160*	P831	67
XQ1161*	P831	67
XQ1180*	P8034A	66
XQ1181*	P8034A	66
XQ1240	8541	66
XQ1241	P849D	66
XQ1280	P842X	66
XQ1290	P842X	66
XQ1291	8541A	66
XQ1292	8541	66
XQ1293	P849D	66
XQ1294	P849D	66
XQ1295	P844	66
XR1-1600A	ZT1011	7
XR1-3200	BT125	7
XR1-3200A	BT125	7
XR1-6400	BT127	7
XR1-6400A	BT127	7
YD1120	BR1160	13
YD1150	BR1195	13
YD1151	BW1195	14
YD1152	BW1195J3	14
YD1160	BR1196	13
YD1161	BW1196	14
YD1162	BW1196J3	14
YD1170*	BR1513	13
YD1171*	BW1513J2	14
YD1172*	BW1513J2	14
YD1175*	BR1513	13
YD1177*	BW1513J2	14
YD1185*	BR1182	13
YD1187*	BW1182J2	14
YD1202	BW1184J2	14
YD1212	BW1185J2	14
YD1230	BR1126	13
YD1240	BR1512	13

Type to be replaced	EEV/M-OV replacement	Page no
YD1244	BR1512A	13
YD1400	YD1400	20
YJ1040*	8356	50
YJ1060	6027H	50
YJ1070	M537A	50
YJ1071	M597	50
YJ1110	M513B	50
YJ1111	M5024	50
YJ1112	M5025	50
YJ1120	M515	50
YJ1121	M5022	50
YJ1123	M5089	50
YJ1124	M5068	50
YJ1200	M5005	51
YJ1250	M5042S	52
YJ1290	M581	52
YJ1300	M5043	50
YJ1390	M5021	50
YK1000*	K365	45
YK1040*	K351	43
YK1046*	K391	43
YL1091	CY1172	18
YL1430	CR1501	17
YL1440	CR1502	17
YL1460	C1136	16
YL1470	CR1505	17
YL1550	YL1550	16
Z759	Z759	21
ZT1011	ZT1011	7
ZX1051	BK448/5551A	4
ZX1052	BK484/5552A	4
ZX1053	BK486/5553B	4
ZX1061	BK502	4
ZX1062	BK544	4
ZX1063	BK482	4
ZX1081	BK492/7669	4
ZX1082	BK494/7671	4
И1-100/1.5	BK504/5554	4
И1-200/1.5	BK46/5555	4
И1-70/0.8	BK502	4
И1-140/0.8	BK484/5552A	4
И1-350/0.8	BK486/5553B	4
ГМИ-83*	C1150/1	16

* † Please refer to page 91.

Continued from back cover

Indonesia	P. T. Tawison Overseas Ltd., Jalan Kopi No. 2, P.O. Box 614/Jak, Jakarta Barat
Iraq	Forster & Sabbagh Co., Electronics & Communications Division, 436/1 Rasheed Street, Baghdad. Tel: 85126
Italy	Marconi Italiana S.p.A., Via A. Negrone 1A, 16153 Genova Cornigliano. Tel: 4108 Telex: Marconit 27386
Japan	Cornes and Co. Ltd., C.P.O. Box 158, Tokyo 100–91. Tel: 272–5771 Telex: J24874
Jordan	Hammad & Kamal Trading Co., P.O.B. 621, Amman. Tel: 25331, 44340 Telex: HKT JO 1249
Kenya (also Tanzania)	Technical and Industrial Representations Ltd., P.O. Box 45375, Nairobi. Tel: 26936/7 Telex: 22381 Flight
Kuwait	United Trading & Technical Services Est., P.O. Box 2208, Kuwait. Tel: 813447 Telex: KT2147
Lebanon	Rizk Brothers, P.O. Box 4875, Beirut. Tel: 237 777, 259 535
Malaysia (West)	The General Electric Co. of Malaysia, Sendirian Berhad, P.O. Box 256, Magnet House, 2 & 4 Jalan Campbell, Kuala Lumpur. Tel: 84291 Telex: 30335
Mexico	ACOSA – Agencias Canadenses Y Occidentales S.A., Apartado Postal 8600, Mexico 1, D.F. Tel: (5) 46 46 46, 46 48 04/5 Telex: 1775865 Acosame
Netherlands	SAIT Electronics Nederland, Strevelsweg 700/507, Rotterdam 3021. Tel: 010 814 644, 010 814 841 Telex: 24315
New Zealand	EEV Products: AWA New Zealand Limited, 36–44 Adelaide Road, P.O. Box 830, Wellington 2. Tel: 51–279 M-OV Products: GEC (New Zealand) Ltd., P.O. Box 2292, Wellington. Tel: 553–949 Telex: 3421
Nigeria	R. T. Briscoe (Nigeria) Ltd., P.O. Box 2104, 8–10 Yakubu Gowan Street, Lagos. Tel: 22735, 26009 Telex: 21249
Norway	Norsk Marconikompani A/S, Instrument & Components Dept., Ryensvingen 5, P.O. Box 50, Manglerud, Oslo 6. Tel: 67 04 86 Telex: 16218 NMK N M-OV Telephone line arresters only: British Imports A.S., P.O. Box 2582 Solli, Oslo 2. Tel: 41 59 35 Telex: 16743
Pakistan	General Products Group Ltd., 239 Staff Lines, P.O. Box 3987, Fatima Jinnah Road, Karachi 4. Tel: 513541–43
Peru	Fernando Ezeta B., Casilla 3061, Lima. Tel: 45–2335
Philippines	Pacific Electronics, 417–419 Singson Building, Plaza Moraga, P.O. Box 458, Manila. Tel: 47 70 20, 49 69 54
Poland	F. A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Anton Roth Strasse 26, German Federal Republic. Tel: (08041) 8576
Portugal	MEDITROM – Comercial de Equipamentos Técnicos SARL, Avenida 5 de Outubro 89, Lisbon 1. Tel: 77 85 95, 76 21 89
Rumania	F. A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Anton Roth Strasse 26, German Federal Republic. Tel: (08041) 8576
Saudi Arabia	General Agencies Corporation, P.O. Box 1988, Jeddah. Tel: 5203
Singapore (also Brunei, East Malaysia)	The General Electric Co. of Singapore Private Ltd., Magnet House, P.O. Box 4046, Bukit Timah, Singapore 21. Tel: 663011 Telex: RS21508
South Africa (also Botswana, Lesotho, Mozambique, Swaziland)	Marconi (South Africa) Ltd., Private Bag 1038, Benoni. Tel: 52–7771/4 Telex: 43–0469 SA M-OV Telephone line arresters only: GEC Power Distribution (Pty) Ltd., Magnet Road, Knights, Transvaal. Tel: 826–3536 Telex: 8–3512 SA
Spain	K370 series klystrons and image orthicons: Suministros Electricos Maldonado, Fernando el Catolico 63, Madrid 15. Tel: 449 04 51/2 Telex: 23498 Other Products: Eurotronica SA, D. Ramon de la Cruz 90, Madrid 6. Tel: 401 52 00 Telex: 27284 EUROT E
Sweden	Svenska Radio AB, Agencies Division, S–102 20 Stockholm. Tel: (08) 22 31 40 Telex: 100–94 SRA S
Switzerland	Erno Electronic A.G., Restelbergstrasse 49, CH8044, Zurich. Tel: (01) 28 94 32 Telex: 52974
Syria	Attar Brothers Company Engineering, Muhdi Bin Barake Street, Building No. 2, P.O. Box 2771, Damascus. Tel: 33 68 86, 44 69 41 Telex: 11023SY Attars Syria
Thailand	Siam Teltech Co. Ltd., 9th Floor, Olympia Thai Building, 956 Rama IV Road, Bangkok. Tel: 867293–7 Telex: BK2631
Trinidad & Tobago, and Guyana	CARTEL – Caribbean Telecoms Ltd., Post Bag 732, Port-of-Spain, Trinidad W.I. Tel: 62–37727, 62–38122
Turkey	Ratel Radio Telecommunication Co. Ltd., Okcu Musa Caddesi, Bankalar Sarayi Kat 3, Karaköy, Istanbul. Tel: 45 50 05, 45 50 06 Telex: 22648
United States of America	Camera Tubes: English Electric Valve North America Ltd., 1 American Drive, Cheektowaga, New York 14225. Tel: (716) 632 5871 TWX: 710 523 1862 General Distributors: Calvert Electronics International Inc., 220 East 23rd Street, New York, N.Y. 10010. Tel: (212) 679 1340 Telex: 666273 M-OV Telephone line arresters only: Telecommunications Industries Inc., 111 North Strong Avenue, Lindenhurst, NY11757. Tel: (516) 842–5000 Telex: 14–4631
Uruguay	Pellmar S.A., Piedras 676–77, Montevideo. Tel: 8–14–47
Venezuela	Marconi de Venezuela C.A., Apartado 3923, Caracas, Postal Zone 101. Tel: 54–51–16/7/8 Telex: 22856
Yugoslavia	F. A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Anton Roth Strasse 26, German Federal Republic. Tel: (08041) 8576
Zambia	GEC–AEI Zambia Ltd., Third Street, P.O. Box 1890, Ndola. Tel: 4251 Telex: ZA3376

Printed in Great Britain by Alan Pooley Printing Ltd.

UK Stockists

Birmingham	Gothic Electronic Components Ltd., Beacon House, Hampton Street, Birmingham 19 3LP. Tel: Birmingham Central (021–236) 5060 Telex: 338731
Bristol	Black Arrow Electronics Ltd., Millbrook Rd., Yate, Bristol BS17 5NX. Tel: Chipping Sodbury (0454) 315824 Telex: 449150
Coventry	EEV Products: Mercia Electronics Ltd., Coronet House, Upper Well Street, Coventry CV1 4AF. Tel: Coventry (0203) 24091–5 Telex: 311243
Liverpool	Smith & Cookson Ltd., 49/57 Bridgewater Street, Liverpool L1 0AU. Tel: Royal (051–709) 3154–7 Telex: 62592
London	EEV and M-OV Products: Edmundson Electronic Components Ltd., 30/50 Ossory Road, London SE1 5AN. Tel: 01–237–0404 Telex: 887212 M-OV Products: Lugton & Co. Ltd., P.O. Box 182, Cross Lane, Hornsey, London N8 7SB. Tel: 01–348–8247 Telex: 25618

International

Information about EEV and M-OV products may be obtained from the following:

Albania	F. A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Anton Roth Strasse 26, German Federal Republic. Tel: (08041) 8576
Argentine Republic	English Electric Marconi Argentina S.R.L., Casilla Correo Central No. 4476 – 1000 Buenos Aires, Av. Antártida Argentina 801, 1836 Llavallol, Lomas de Zamora, Buenos Aires. Tel: 244–1056, 244–1057 Telex:0122253, B.A. M-OV Telephone line arresters only: See United States of America.
Australia	GEC Automation and Control, GECET Division, 373 Horsley Road, Milperra N.S.W. 2214. P.O. Box 27, Revesby, N.S.W. 2212. Tel: 77 0551 Telex: AA20807 M-OV Telephone line arresters only: GEC Telecommunications, 9 Bibby Street, Chiswick N.S.W. 2046. Tel: 83 4011 Telex: AA20265
Austria	William Pattermann, Rudolfinergasse 18, P.O. Box 101, 1190 Vienna XIX. Tel: 36 36 47 Telex: 7–4532
Bangladesh	The General Electric Company of Bangladesh Ltd., Magnet House, 72 Dilkhusha Commercial Area, Motijheel, P.O. Box 123, Dacca 2. Tel: 281859, 252011–13 Telex: 734 GECDAC
Barbados	Balmoral Ltd., Hastings, Barbados, W.I. Tel: 7763
Belgium, Luxembourg, Zaire, Katanga, Rwanda	SAIT Electronics, 66 Chaussée de Ruisbroek, 1190 Brussels. Tel: 02/376 20 30 Telex: 21601
Brazil	IGB-Staub Eletronica S.A., Caixa Postal 30–318, Sao Paulo. Tel: 247–3539, 247–3630, 247–9611 Telex: (011) 23135 Sao Paulo Brazil M-OV Telephone line arresters only: See United States of America.
Bulgaria	F. A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Anton Roth Strasse 26, German Federal Republic. Tel: (08041) 8576
Canada	English Electric Valve North America Ltd., 67 Westmore Drive, Rexdale, Ontario M9V 3Y6. Tel: 416 745 9494 Telex: 06 965864 M-OV Telephone line arresters only: See United States of America.
Chile	Gibbs Y Cia S.A.C., Providencia 1050-Torre D., Casilla 16254, Santiago. Tel: 231061 Telex: Gibbs SG0309 M-OV Telephone line arresters only: See United States of America.
China and Hong Kong	Marconi (China) Ltd., G.P.O. Box 186, Wellington Plaza, 10th Floor, 58 Wellington Street, Hong Kong. Tel: 221189 Telex: HX74141 MARFE
Colombia	Repro Ltda., Apartado Aereo 5660, Bogota D.E. Tel: 34 41 40 Telex: 441271 Riam Co.
Czechoslovakia	F. A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Anton Roth Strasse 26, German Federal Republic. Tel: (08041) 8576
Denmark	Classen-Smidth Import A-S, Herlev Hovedgade 201C, 2730 Herlev–Copenhagen. Tel: (01) 91 30 66 Telex: 19434 CSI
Finland	EEV Products: Aseko Oy, Vuorikatu 22, 00100 Helsinki 10. Tel: 65 95 77 Telex: 122242 M-OV Products: Carlo Casagrande Oy, P.O. Box No. 3, SF-00101, Helsinki 10. Tel: 64 07 11, 64 06 41 Telex: 12 1677
France	GEC Composants s.a., Département Tubes Electroniques, Tour d'Asnières, 3 Avenue Laurent Cély, 92 606 Asnières. Tel: 791 44 44 Telex: 610471F Inelmec
German Democratic Republic	F. A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Anton Roth Strasse 26, German Federal Republic. Tel: (08041) 8576
German Federal Republic	Nucletron Vertriebs – G.m.b.H., Gärtnerstrasse 60, 8 Munich 50. Tel: (089) 14 60 81–85 Telex: 5215297
Ghana	Benarvey Trading Agencies Ltd., P.O. Box 2466, Accra.
Greece	EEV Products: Telectrotec, 18 Voulis Street, Athens 126. Tel: 322 72 67 M-OV Products: Christodoulou Brothers Ltd., 72 3rd September Street, Athens 103. Tel: 83 30 78, 81 05 82, 81 19 76 Telex: 21 5163
Hungary	F. A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Anton Roth Strasse 26, German Federal Republic. Tel: (08041) 8576
Iceland	Orka Ltd., P.O. Box 360, Laugavegur 178, Reykjavik. Tel: 65 95 77 Telex: 2095
India	Aimil Sales and Agencies Private Ltd., B5 Gillander House, P.O. Box 440, Calcutta 700 001. Tel: 223304 Telex: 021 7731

Continued inside back cover