

Professional Electron Tubes

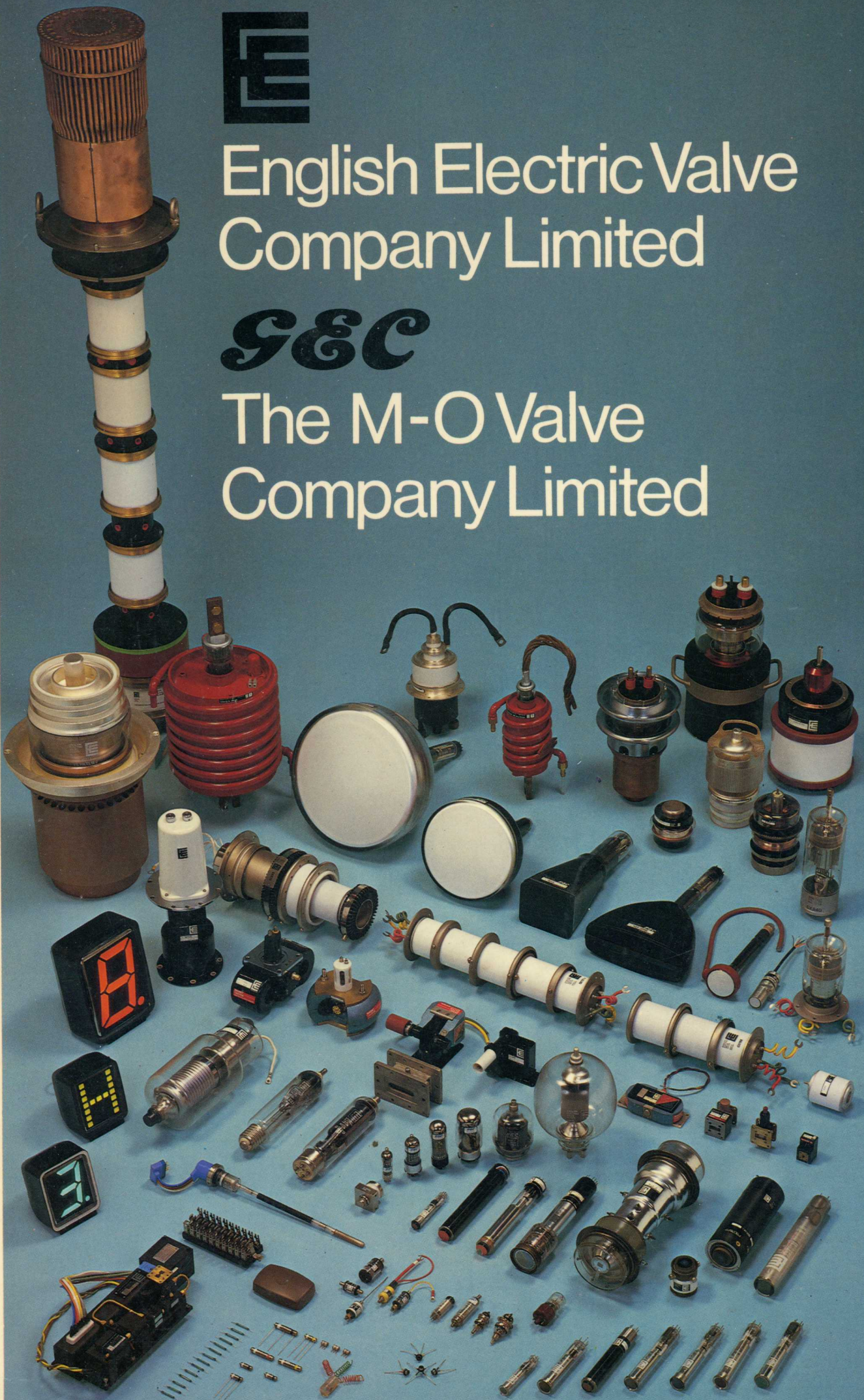
1980~81



English Electric Valve
Company Limited

S&C

The M-O Valve
Company Limited



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.

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and The M-O Valve Company Limited

ABRIDGED DATA 1980/81 - 160 NEW TYPES ADDED

Here is your personal copy of the EEV/M-OV Abridged Data Book for 1980/81, which describes the most important European range of professional electron tubes and devices.

Contents

The catalogue is produced as a single publication covering the current range of electron tubes, devices and accessories produced by EEV and M-OV and includes information on over 160 new types. The first section of the catalogue gives abridged data for the range; it is divided into product sections and thumb-indexed for easy access. This is followed by a comprehensive equivalents index showing all the tubes for which EEV/M-OV can offer a replacement

Colour Code

A colour code is used in the tables throughout the catalogue and in the equivalents index; EEV entries are printed in brown and M-OV entries are in blue. Thus you can distinguish immediately between EEV and M-OV entries.

Ordering

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

Special Products

When you need a special electron tube or wish to discuss particular applications we would like to hear from you. We welcome the opportunity of discussing your requirements and the possibility of supplying special tubes not covered by our standard range.

Yours faithfully,



M.P. Mandl
Marketing Director

ABRIDGED DATA

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 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 ABREGÉES

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 disponibles sur demande.

Certains types mentionnés dans ce catalogue peuvent ne pas être disponibles 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

KURZGEFASSTE DATEN

Auf den folgenden Seiten finden Sie kurzgefaßte Daten für das gegenwertige 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 gegenwertigen 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

RESUMEN INFORMATIVO DE DATOS

En las páginas siguientes aparece un resumen informativo de datos correspondientes a la nueva 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 mínimo. 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

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 presente 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

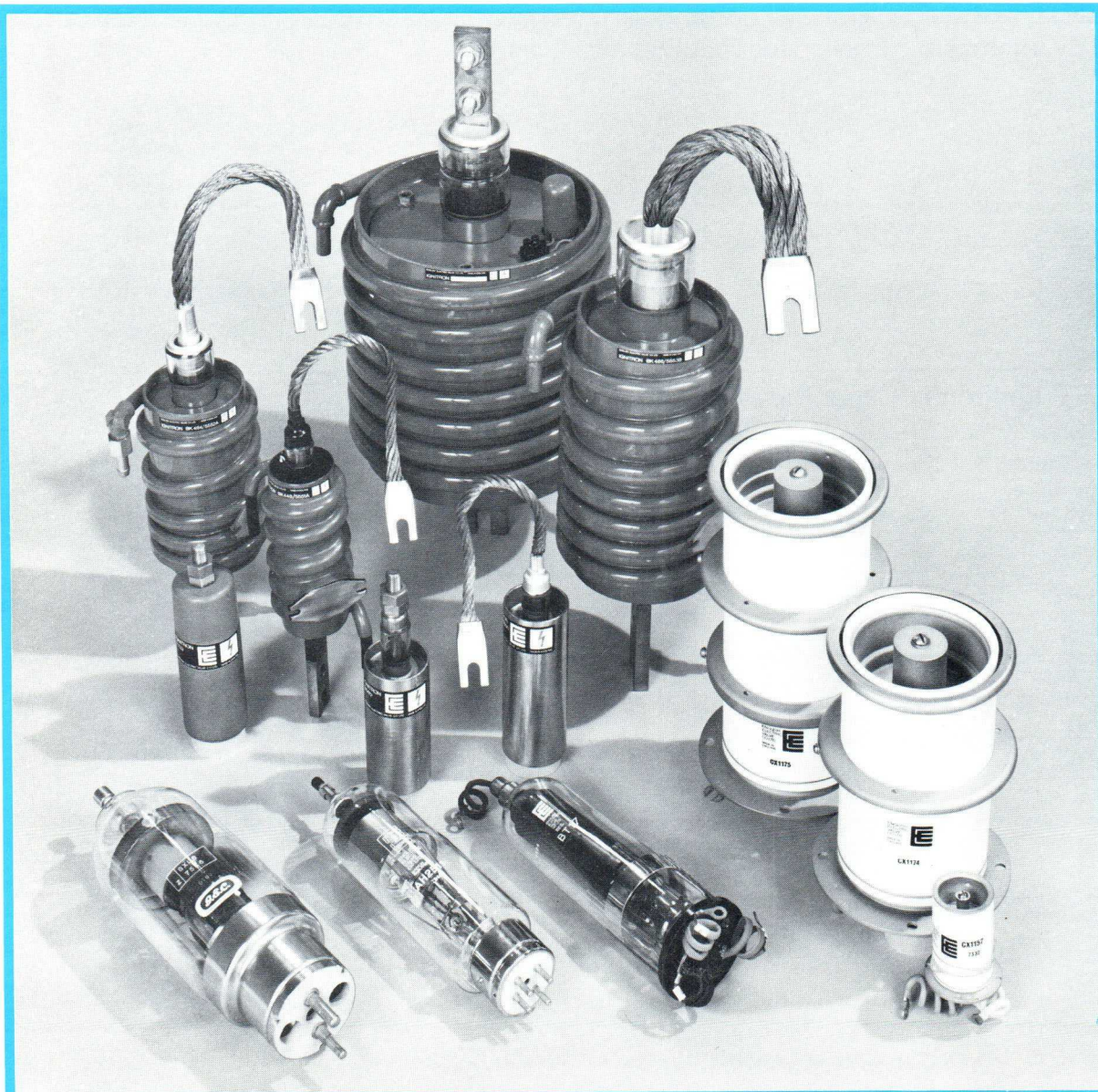
Nel presente opuscolo, si usa il seguente codice:-

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

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Power Devices



EEV Ignitrons - A.C. Resistance Welding

International letter size	Type	Single phase service□			3-phase (frequency changing) service		
		Maximum demand (kVA)	Corresponding average anode current (A)	Maximum average anode current (A)	Maximum peak current (at 1500 V peak) (A)	Corresponding average anode current (A)	Maximum average current (at 1500 V 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					
Up-rated 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
Up-rated C	BK544	2300	110	180	—	—	—
Up-rated C	BK518	As BK544 but with coaxial cathode terminal flange					
D	BK486/5553B	2400	192	355	2400	32	112
D	BK498/7673	As BK486/5553B but with coaxial cathode terminal flange					
Up-rated D	BK482	3225	210	400	—	—	—
Up-rated D	BK500	As BK482 but with coaxial cathode terminal flange					

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

EEV Ignitrons - Power Rectification and Control

International letter size	Type	Maximum ratings (at 900 V peak)			Ignitor requirements	
		Peak anode current (A)	Average continuous current (A)	Average current 1 minute (A)	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	BK472◆	20	100	0.75	20
A	BK474♣	20	100	0.75	20
A	BK476†	20	100	0.75	20
A	BK508◇	50	15	0.75	20
→ A	BK514◆	50	15	0.75	20
A	BK7703◇	25	100	0.75	30
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.

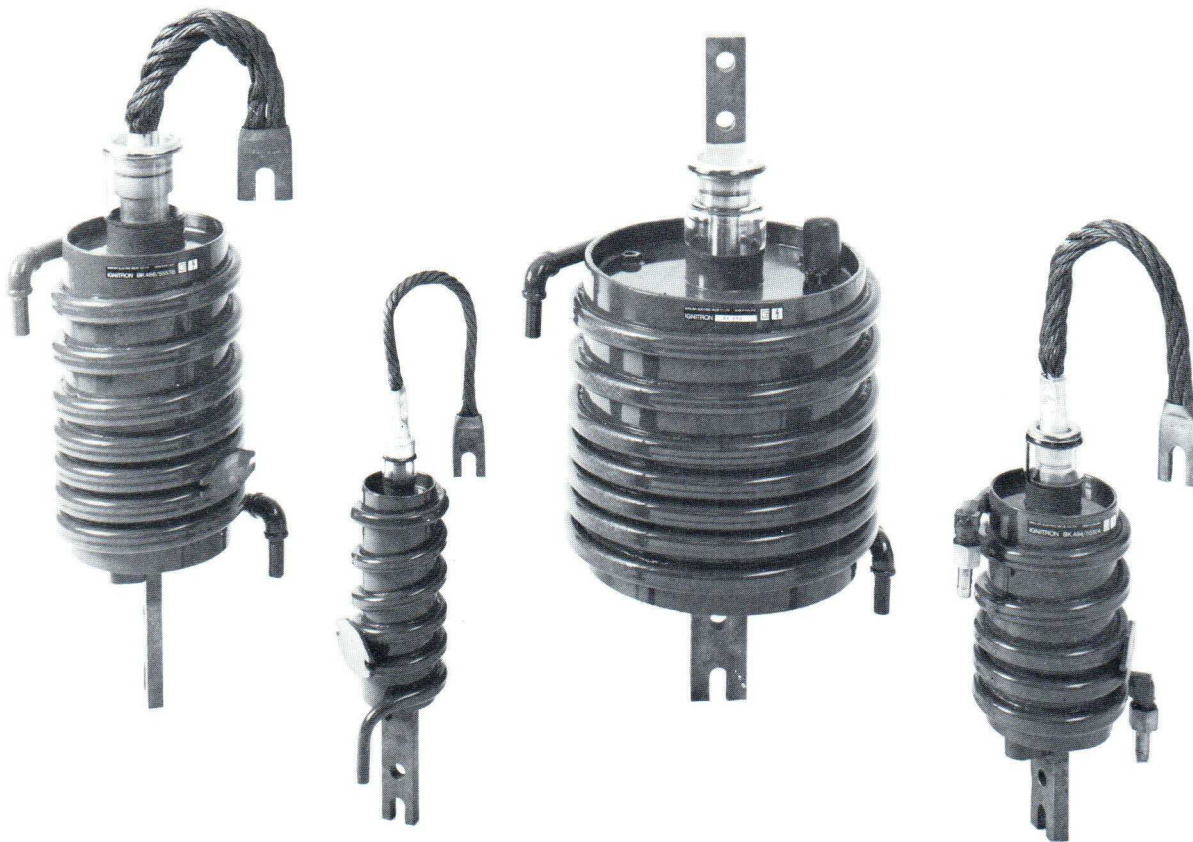
→ New type.

EEV High Vacuum Rectifiers

Peak inverse voltage max (kV)	Type	Average anode current max (mA)	Peak anode current max (A)	Filament or heater		Base
				Voltage (V)	Current (A)	
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		Base
				Voltage (V)	Current (A)	
1.375	CV4005‡	75	0.23	6.3	0.6	B7G
7.1	U19 (CV187)	250	1.5	4.0	3.3	B4



A group of Ignitrons

- Single phase ratings are for two ignitrons in reverse parallel at any voltage from 250 to 600 V_{r.m.s.}
- ◆ For reduced degree of current reversal and switching applications.
- ♣ For current reversal at reduced voltage and current.
- † For zero current reversal.
- ◇ For use with high voltage and high current reversal.
- ☆ 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	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
1.75	GU25 ■	13.5	7.0	12.8	4.5	5.0	7.0	B4F
3.0	GXU6 (CV5968) ■	15	12	14	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 load		Filament or heater		Base
				Voltage (kV)	Current (A)	Voltage (V)	Current (A)	
0.25	GXU1 (CV1835)	10	1.0	9.5	0.75	2.5	5.0	4-Pin UX
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.
1.25	GXU2 (CV2518)	13	5.0	12	3.75	5.0	7.0	B4F
1.25	(CV2399) GXU3 (CV8062)	13	6.0	12	3.75	4.0	11	G.E.S.
1.25	GXU4 (CV9006)	13	5.0	12	3.75	4.0	7.0	G.E.S.
1.75	AH2532	13	7.0	12.4	5.25	5.0	7.0	B4F
→ 1.75	AH2532A	13	7.0	12.4	5.25	5.0	7.0	G.E.S.
1.75	BD512A	13	7.0	12.4	5.25	5.0	7.0	B4F
1.75	BD512B	13	7.0	12.4	5.25	5.0	7.0	B4D
1.75	BD512C	13	7.0	12.4	5.25	5.0	7.0	G.E.S.
1.5	BD522	15	6.0	14.3	4.5	5.0	7.0	B4F
→ 1.75		7.0	7.0	6.7	5.25			
1.5	BD522D	15	6.0	14.3	4.5	5.0	7.0	E47-4
→ 1.75		7.0	7.0	6.7	5.25			
2.0	AH211A (CV532)	16	8.0	15.2	6.0	2.5	30	B2D
→ 2.5	BD520	22	10	21	7.5	5.0	7.5	B5D
→ 2.5	BD520B	22	10	21	7.5	5.0	7.5	B4F
→ 2.5	BD520C	22	10	21	7.5	5.0	7.5	B4D
→ 2.5	BD520D	22	10	21	7.5	5.0	7.5	E47-4
3.0	GXU5	10	18	9.0	9.0	2.5	30	Special 2-Pin
3.0 5.0	AH2511 (6693)	15	12	14.3	9.0	5.0	11.5	B4D
		2.5	20	2.4	15			
3.0 5.0	BD510	15	12	14.3	9.0	5.0	11.5	B4P
		2.5	20	2.4	15			
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
5.0	BD524	26	20	24.8	15	5.0	30	Leads
→ 10		18	40	17.4	30			

→ New type.

M-OV Argon-filled Thyratron

Average anode current max (mA)	Type	Description	Anode voltage max (V)	Peak anode current max (A)	Heater ratings		Base
					Voltage (V)	Current (A)	
300	GT1C (CV1128) [▲] ■	Triode	500	1.0	4.0	1.35	B5

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		Base
						Voltage (V)	Current (A)	
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	5.0	4.0	11	B4F
1.25	BT147A	M.V.	10	10	7.5	5.0	7.0	B4F ←
1.5	BT95 (CV5141)	M.V.	15	15	12	2.5	20	Leads
1.6	BT143	M.V./Argon	1.5	1.5	6.4	2.5	7.0	B4G
1.75	BT147	M.V.	15	15	7.5	5.0	7.5	B5D ←
1.75	BT 149	M.V.	15	15	7.5	5.0	7.5	B4F ←
1.75	BT149A	M.V.	15	15	7.5	5.0	7.5	B4D ←
2.5	BT5 (CV1147)	M.V.	1.5	1.0	12.5	5.0 §	4.7	B4G
2.5	BT5B (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
3.0	BT95B	M.V.	22	22	12	5.0	12	B4D ←
3.2	BT125	M.V./Argon	1.5	1.5	40	2.5	12	B4D
3.6	BT145	M.V./Argon	2.0	2.0	40	2.5	12	B4D
3.6	BT145A	M.V./Argon	2.0	2.0	40	2.5	12	B4D ←
3.6	BT145B	M.V.	5.0	4.5	40	2.5	12	B4D ←
2.5 5.0	BT139	M.V.	22 2.5	22 2.5	10 20	5.0	13	B4D
5.0	BT141 (CV447)	M.V.	20	20	20	5.0	20	Special
5.0	BT141A	M.V.	24	24	20	5.0	22	Special ←
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
6.4	BT127A	M.V.	5.0	4.5	80	2.5	21	B4D ←
6.4	BT135	M.V./Argon	2.0	2.0	80	2.5	21	B4D
10	BT137	M.V.	2.5	1.5	100	5.0 §	11	Special
10	BT69F	M.V.	15	15	60	5.0	14	Leads
10	BT69G	M.V.	15	15	60	5.0	14	Special
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
12.5	BT153	M.V./Argon	2.0	2.0	150	2.5	27	Leads ←

■ Made to special order only.

§ Indirectly heated.

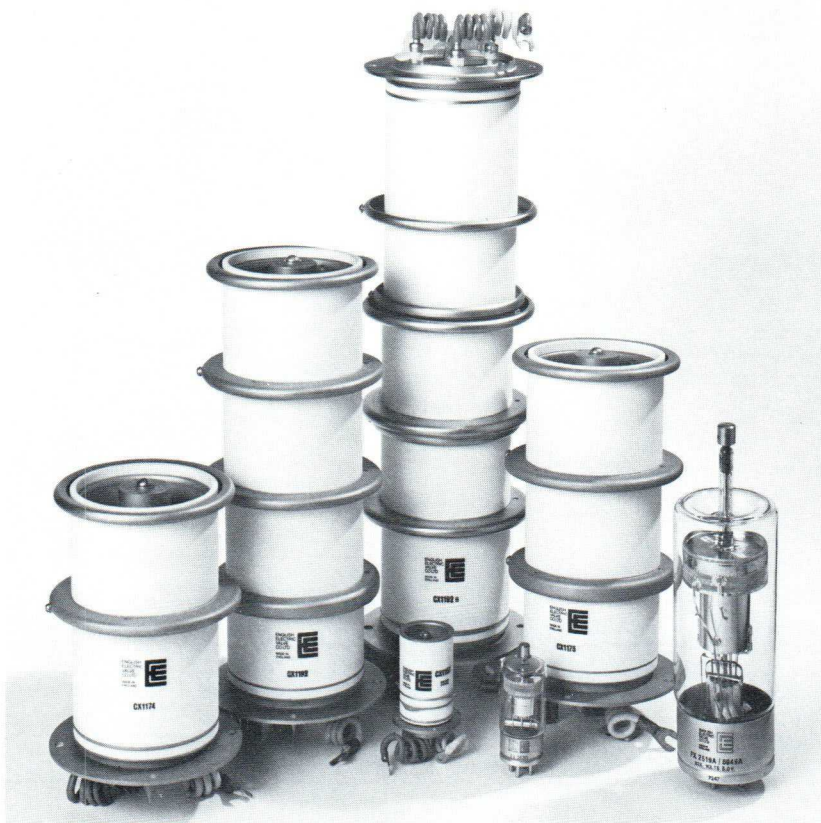
▲ Maintenance type, not recommended for use in new equipment.

→ New type.

EEV Hydrogen Thyratrons - Glass Envelope

Peak anode current max (A)	Type	Description	Peak forward voltage max (kV)	Average anode current max (A)	Peak output power (MW)	Heating (P_D) factor $\times 10^9$ 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	FX2535 §	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	
200	FX2525 §	Triode	16	0.2	1.6	3.0	‡	6.3/6.1	
325	FX2501 §	Triode	16	0.225	2.0	3.9	‡	6.3/10.6	
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	CX1191D §•	Tetrode	35	0.5	8.0	8.0	‡	6.3/12.5	
500	FX2519A/5949A	Triode	25	0.5	6.25	6.25	4.5/3.0	6.3/18.5	
500	FX297	Triggered diode, 25 kV P.I.V., 1.25 A average current						‡	6.3/21.5
500	FX2503•	Triggered diode, 33 kV P.I.V., 1.25 A average current						‡	6.3/21.5
→ 600	CX1558•	Tetrode	35	0.6	10.5	8.0	6.3/6.0	6.3/12	
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	
→ 1500	CX1559•	Tetrode	35	1.5	17.5	14	6.3/8.0	6.3/21.5	

A group of Hydrogen Thyratrons



EEV Hydrogen Thyratrons - Ceramic Envelope

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 $\times 10^9$ max†	Reservoir voltage/current (V/A)	Heater voltage/current (V/A)	
350	CX1164 §	Tetrode	12	0.5	2.1	7.0	6.3/1.5	6.3/7.5	
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	10	6.3/2.0	6.3/12	←
1000	CX1180 •	Tetrode	25	1.25	12.5	12.5	6.3/6.0	6.3/12	
1000	CX1535	Pentode	25	1.25	12.5	500	6.3/6.0	6.3/16.5	
1000	CX1535A	Pentode	18	1.25	8.0	15	6.3/6.0	6.3/16.5	←
3000	CX1570	Tetrode	16	0.3	24	5.0	6.3/1.5	6.3/7.5	←
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	90	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	
3000	CX1545 •	Four gap tetrode	120	2.0	180	70	5.0/7.0	6.3/21.5	←
3000	CX1545B •	Double ended four gap	120	2.0	150	60	5.0/7.0	6.3/21.5	←
4000	CX1571 •	Tetrode	20	0.5	40	8.0	6.3/2.0	6.3/12	←
5000	CX1572 •	Tetrode	25	1.25	62	12	6.3/6.0	6.3/12	←
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	260	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	
7500	CX1573 •	Tetrode	35	3.0	130	25	5.0/7.0	6.3/21.5	←
15000	CX1574 •	Tetrode	35	6.0	260	52	5.0/10	6.3/40	←

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

* Near equivalent.

• Deuterium filled.

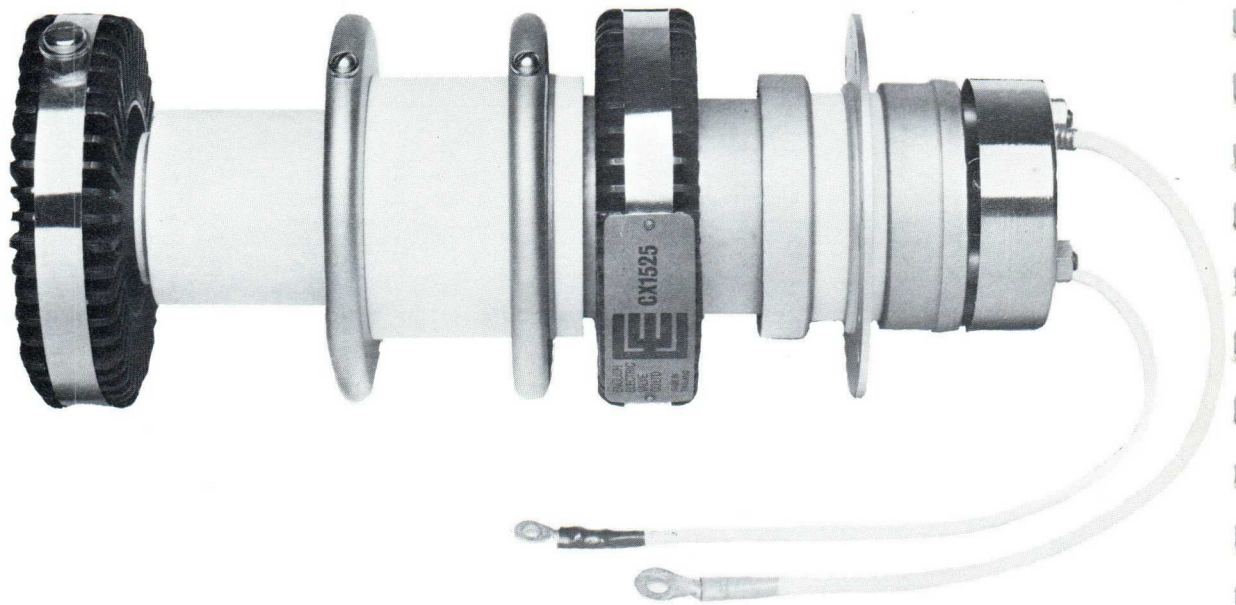
‡ Reservoir operates from cathode heater supply.

§ Rugged.

→ New type.

EEV Hydrogen Thyratrons - Metal Envelope - Pulse Service

Peak anode current max (A)	Type	Description	Peak forward voltage max (kV)	Average anode current max (A)	Peak output power (MW)	Heating (P_D) factor $\times 10^9$ max†	Reservoir voltage/current (V/A)	Heater voltage/current (V/A)
3500	CX1526A●	Tetrode	40	5.0	70	70	6.3/5.0	6.3/36
3500	CX1528●	Tetrode	40	5.0	70	70	6.3/5.0	6.3/36
3500	CX1525●	Two gap tetrode	70	5.0	100	100	6.3/5.0	6.3/36
10 000	CX1527A●	Tetrode	40	15	200	200	6.3/8.0	6.3/90
→ 10 000	CX1549●	Tetrode	40	15	200	200	6.3/7.0	6.3/90
10 000	CX1536●	Two gap tetrode	70	10	350	300	6.3/8.0	6.3/90



Metal envelope Hydrogen Thyatron CX1525

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	CX1526B●	Tetrode	40	20	320	6.3/5.0	6.3/36
120	CX1527B●	Tetrode	40	60	1000	6.3/8.0	6.3/90

→ New type.

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

● Deuterium filled.

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Transmitting
Tubes

Triodes
Tetrodes

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		Base
						(V)	(A)	
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
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■	—	80	—	200	10	20	Flying lead

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		Base
						(V)	(A)	
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 5 s.

* 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)	(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	BR179 (CV2323)△	17	8.5	50/110	28	6.6	90
10	BR1124●	20	8.5	100	37	6.0	115
10	BR1513● BR1513F●□	30	9.0	100	13	6.6	103
10	BR1513A● BR1513AF●□	30	9.0	100	24	6.6	100
10	BR1514● BR1514F●□	38	10	100	23	7.5	100
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

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)	(A)
0.4	ACT25 (CV436)	0.256 §	1.0	500/1000	75	13.5	2.8
0.6	YD1420	250◇	13◇	220/600	45	17	8.0
1.5	ACT27■	1.2 §	1.5	350/600	50	15	6.7
1.5	ACT28 (CV2163)■	200◇	11◇	400	45	16	7.3
1.5	ACT28A (CV5326)■	300◇	13◇	220/600	45	16	7.3
2.0	ACM3 (CV10361)△	0.7 †	2.0	5.0	14	6.0	16

→ New type.

Transmitting
Tubes

Triodes
Tetrodes

EEV Power Triodes - Water Cooled

Anode dissipation max (kW)	Type	Output power (kW) §	Anode voltage max (kV)	Frequency (MHz)*	Amplification factor	Filament ratings		Water jacket
						(V)	(A)	
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
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	BW1181J3△	26	8.0	100	11	6.6	103	Integral
15	BW1513J2● BW1513J2F●□	30	9.0	100	13	6.6	103	Integral
→ 15	BW1514J2● BW1514J2F●□	38	10	100	23	7.5	100	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
20	BW1102● BW1102J2●	53	12	50	42	8.2	230	BW4028 Integral
20	BW1176J1● BW1176J2●	82	10	20	38	8.2	230	Integral
→ 20	BW1515J2F●□	82	10	20	18.5	8.2	230	Integral
30	BW1143● BW1143J2●	77.5	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
→ 50	BW1161	120	14	10/30	90	11	155	BW4215
80	BW1184J2●	120	14.4	30	30	12.2	255	Integral
120	BW1185J2●	240	16.8	30	41	12.6	380	Integral
175	BW1156△	250	14	27	23	12.2☆	290☆	BW4035

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.

→ New type.

§ 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.

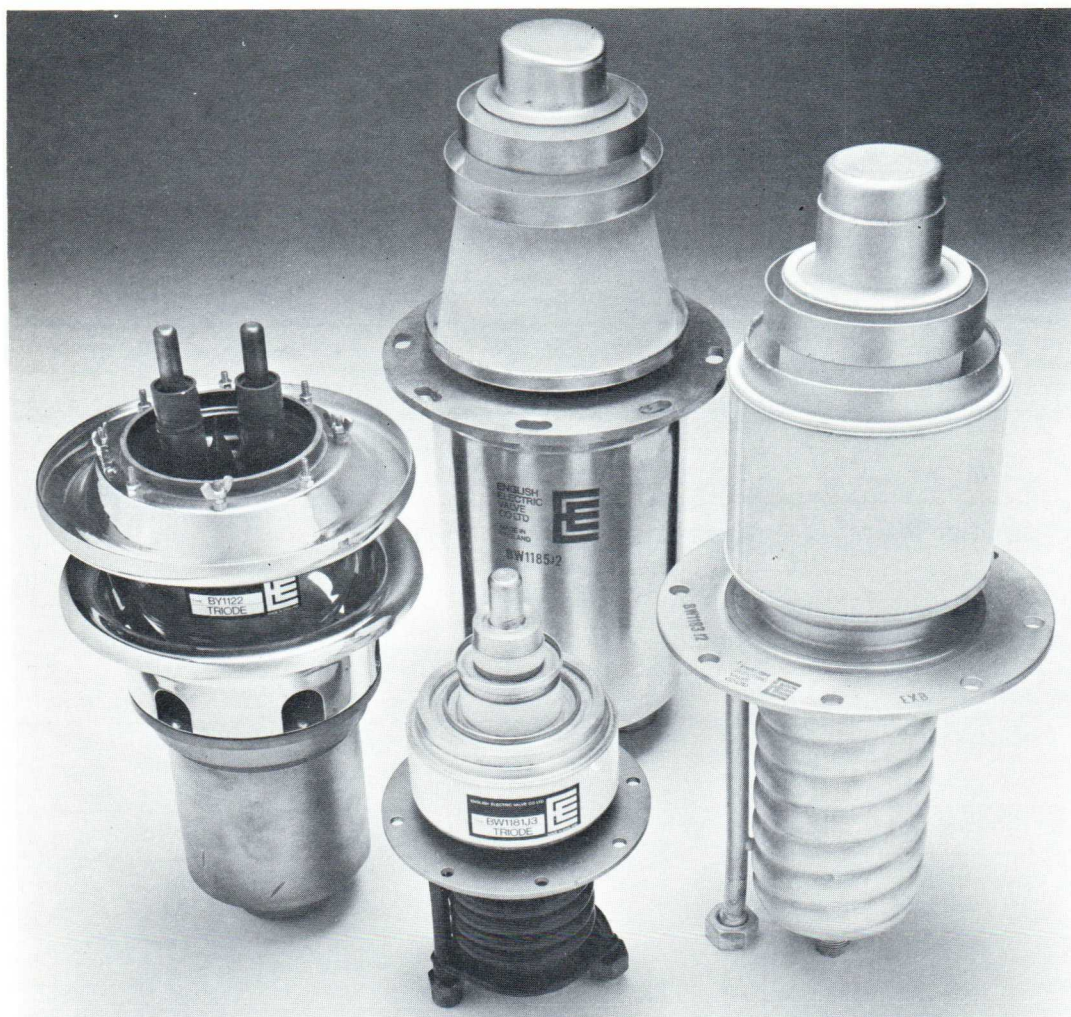
** Double unit with integral condenser.

■ 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		Boiler unit
						(V)	(A)	
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	77.5	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	BY1144L□	200	14	27	34	9.6☆	290☆	BY4036▲ BY4060‡

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



Power Triodes BY1122, BW1181J3, BW1185J2, BW1183J2

Transmitting
Tubes

Triodes
Tetrodes

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		Base
						(V)	(A)	
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 14	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		Base
						(V)	(A)	
37.5	TT21 (CV8286)	160	1250	30/60	8.0	6.3	1.6	B8.0
37.5	TT22	160	1250	30/60	8.0	12.6	0.8	B8.0
100	TT100	200	1250	30	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)	(A)
0.25	CCS1■e	0.4 §	2.0	175/500	5.0	6.0	2.6
0.30	YL1550	0.06◆	2.0	80◆	6.0	6.0	2.4

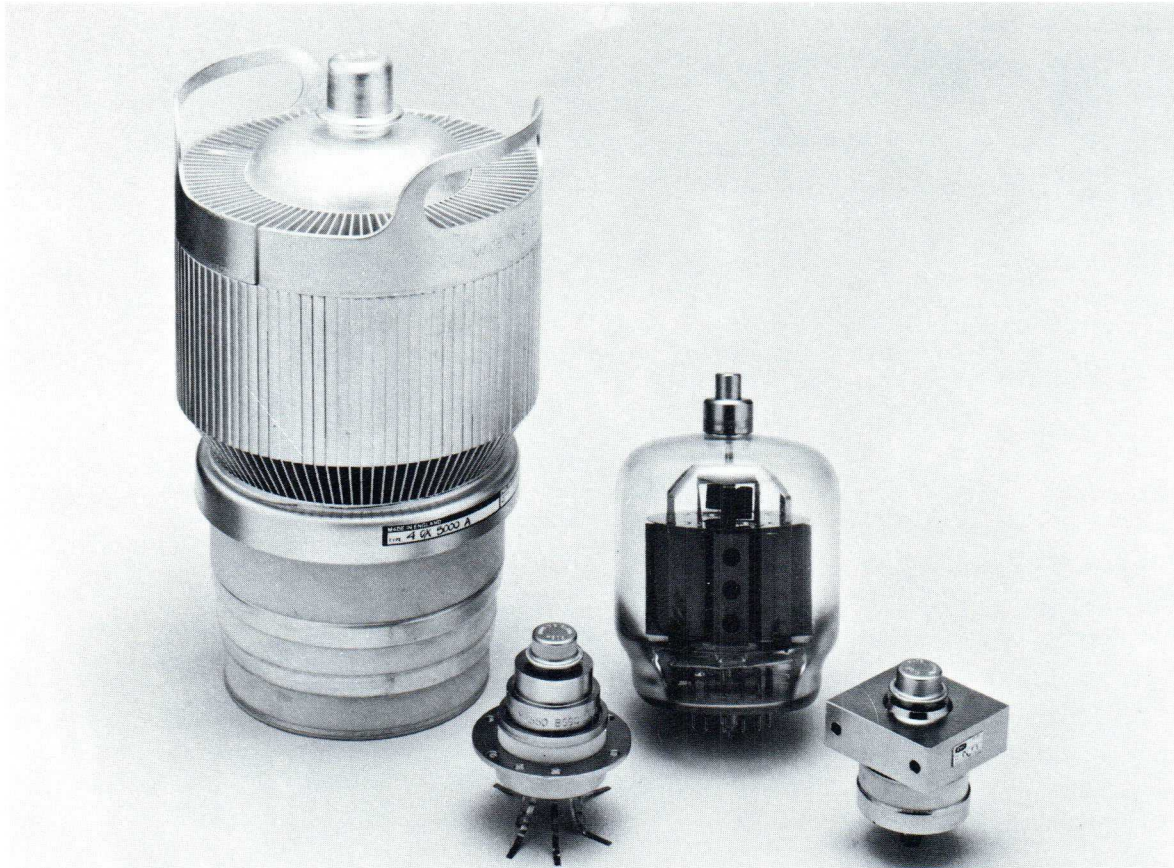
EEV Pulse Amplifier Tetrodes - Glass Envelope

Pulse output power (kW)	Type	Anode dissipation max (W)	Anode voltage max D.C. (kV)	Pulse anode current max (A)	Heater ratings		Base
					(V)	(A)	
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)	(A)
0.25	4CX250B	0.4	2.0	175/500	5.0	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)	(A)
1.0	4CX1000A	3.2†	3.0	110	—	6.0	9.0
1.5	4CX1500B (8660)	2.7†	3.0	30	—	6.0	9.0
1.5	CR1502	2.4‡	4.0	260	16	4.2	53
5.0	4CX5000A (CV8295)	16	7.5	30/110	4.5	7.5	75
10	4CX10,000D (CV6184)	16	7.5	30/110	4.5	7.5	75
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)	82.5	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 $V_a = 800$ V, $I_k = 165$ mA, $V_{drive} = 40$ V crest, $I_{g1} \geq 4$ mA.

†† VHF double beam tetrode.

◆ With 2 sections in push-pull.

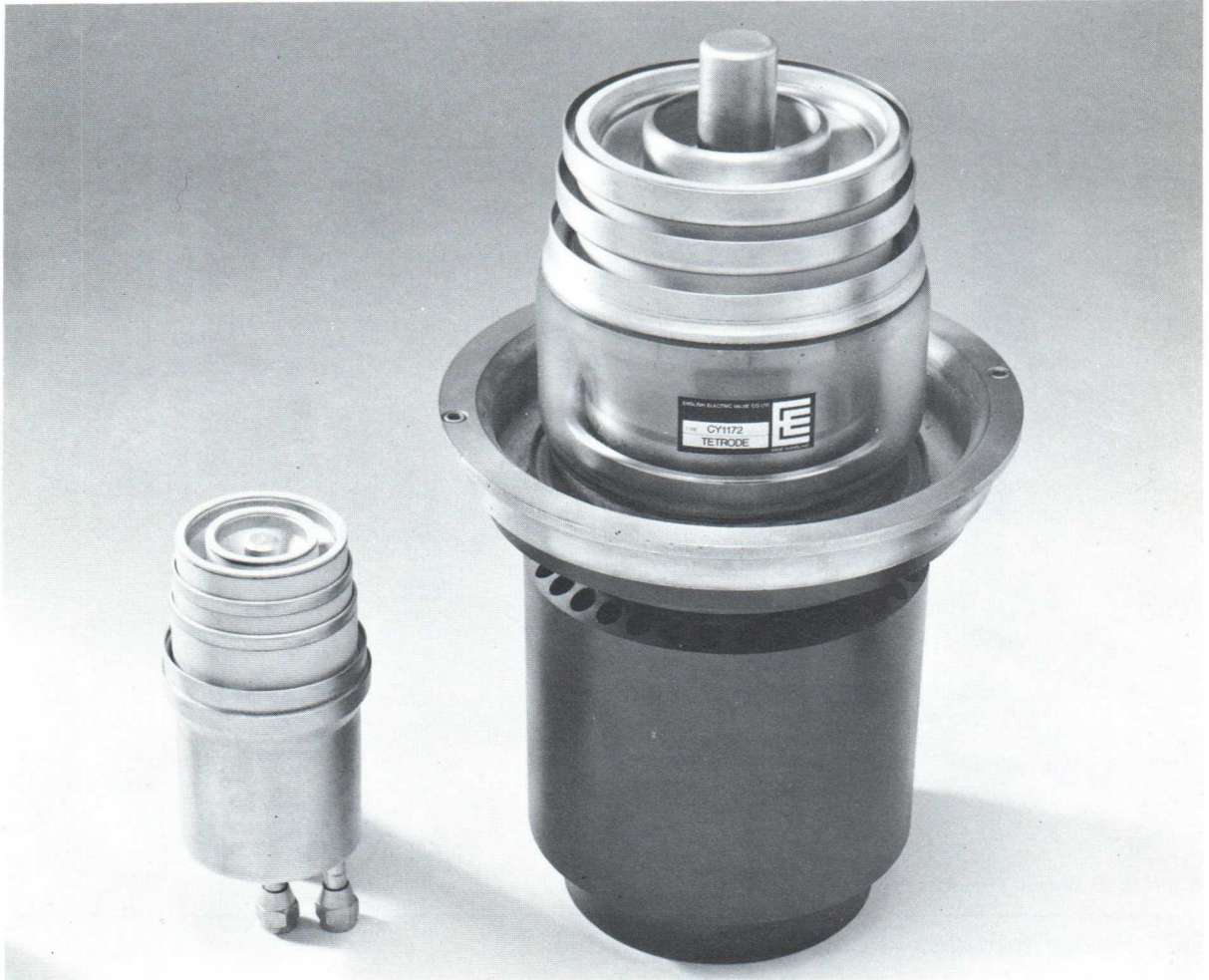
§ Under Class C unmodulated conditions.

Transmitting Tubes

Triodes
Tetrodes

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		Water jacket
						(V)	(A)	
10	4CW10,000A	16	7.5	30/110	4.5	7.5	75	Integral
25	4CW25,000A	36.5	10	110/225	4.5	6.3	160	Integral
→ 75	CW1600J2	82.5	15	30	4.5	10	300	Integral



Power Tetrodes 4CW10,000A and CY1172

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		Boiler unit
						(V)	(A)	
75	CY1170J	82.5	15	30	4.5	10	300	Integral
150	CY1172	220*	15	30	4.0	20	340	CY4120

→ New type.

§ Under Class C unmodulated conditions.

* 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.

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Receiving Tubes

Noise Diodes
Triodes
Tetrodes
Pentodes
Stabilizers

Receiving Tubes



M-OV Noise Diode

Maximum frequency (MHz)	Type	Anode current max (mA)	Anode dissipation max (W)	Anode voltage max (V)	Heater voltage max (V)	Heater current (A)	Base
2500	CV2341■	200	40†	400	4.7	3.8	Coaxial 70 Ω

M-OV Triodes

Anode dissipation max (W)	Type	Anode voltage max (V)	Anode current (mA)	Mutual conductance (mA/V)	Filament ratings		Base
					(V)	(A)	
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	CV2453◆	250	16	15	6.3	0.37	B9A
2.5	L63 (CV1067)△■	250	9.0	2.6	6.3	0.3	B8.0
2 × 3.5	A2900 (CV6091)*‡	500	2 × 10	2 × 6.2	6.3	0.4	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
2 × 13	(CV2984) 6080 (CV10332)*▲	250	2 × 125	2 × 7.0	6.3	2.5	B8.0
2 × 13	6080WA (CV5008)*‡▲	250	2 × 125	2 × 7.0	6.3	2.5	B8.0
15	A2293 (CV8089)▲■	500	100	12	6.3	0.95	B9A
15	CV4079‡▲■	500	100	12	6.3	0.95	B9A

M-OV Tetrodes and Pentodes

Anode dissipation max (W)	Type	Anode voltage max (V)	Anode current (mA)	Mutual conductance (mA/V)	Filament ratings		Base
					(V)	(A)	
1.0	CV4085	300	3.0	2.0	6.3	0.2	B9A
30	KT66 (CV1075)¶	550	85	7.0	6.3	1.3	B8.0
32	KT77¶	850	100	12.5	6.3	1.4	B8.0
42	KT88 (CV5220)¶	800	150	11.5	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		Base
					(V)	(A)	
12	A2226 (CV2231)■	10	3.0	8.5	6.3	1.2	B9A
12	A3042■	5.0	3.0	8.5	6.3	1.2	B9A
15	(CV4082)‡ A2426 (CV8978)	8.0	7.5	8.0	6.3	1.3	B8.0

- ◆ Low noise type.
- Made to special order only.
- ‡ Special quality type.
- △ Maintenance type, not recommended for use in new equipment.
- † Forced-air cooled.
- * Double triode.
- ▲ Series stabilizer type.
- ¶ Audio type.
- ◇ Similar to DET23 but with noise factor strictly controlled.
- ♣ UHF diode.

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)	(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■ DET29M■	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.

Type	at $V_a = 250$ V			C_{a-g} (pF) (measured on a cold unscreened tube)
	at $I_a = 40$ mA		at $I_a = 20$ mA	
	$-V_g$ (V)	$-V_g$ (V)	g_m (mA/V)	
DET22	—	5.0 ± 4.0	6.0 ± 3.0	1.05 ± 0.35
DET22D■	5.5 ± 2.5	8.0 ± 2.0	6.0 ± 2.0	1.05 ± 0.35
DET22E■	2.0 ± 1.0	6.0 ± 1.0	6.0 ± 2.0	1.05 ± 0.35
DET22R■	—	6.7 ± 2.2	6.3 ± 1.7	1.1 ± 0.1

Details of other DET22 variants are available on request.

EEV Voltage Stabilizers

Operating voltage approx (V)	Type	Striking voltage max (V)		Tube current range (mA)	Regulation max (V)	Base
		○	●			
75	QS75/20	110	160	2–20	6.0	B7G
78	75C1 (CV4080)	115	115	2–60	8.0	B7G
85	QS1209/5651 (CV449, CV2012)	115	160	1–10	4.0	B7G
85	QS1212 (CV5285)	115	115	1–10	4.0	B7G
85	QS1213	115	115	1–10	4.0	B7G/F
90	QS1215 (CV5173)	115	115	1–40	12	B7G
150	(CV4100) 0A2WA (CV8168)	165	165	5–30	5.0	B7G
150	QS150/15 (CV287)	170	—	2–15	5.0	B7G
150	QS1200 (CV2225)	180	225	5–15	5.0	B7G
150	150C4 (CV10664)	185	185	5–30	5.0	B7G
150	(CV1832) 0A2 (CV8161)	185	225	5–30	6.0	B7G

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

- In normal lighting.
- In total darkness.

Receiving Tubes

Noise Diodes
Triodes,
Tetrodes
Pentodes
Stabilizers

M-OV Stabilizer Tubes - Corona

Stabilized output voltage (V)	Type	Operating current		Continuous current max (μ A)	Typical incremental impedance (k Ω)	Temperature coefficient (% $^{\circ}$ C)	Terminals
		Min (μ A)	Max (μ A)				
350	SC1/350 (CV2456)	5.0	425	325	17.5	0.01	
400	SC1/400 (CV2457)	5.0	450	350	20	0.01	
500	SC1/500	10	475	375	25	0.01	
600	SC1/600 (CV2458)	10	500	400	30	0.01	Top cap CT1
800	SC1/800 (CV2459)	20	575	475	40	0.01	
1000	SC1/1000 (CV2460)	20	650	550	50	0.01	
1200	SC1/1200 (CV2461)	20	725	625	60	0.01	Base B7G
1400	SC1/1400 (CV2462)	20	800	700	70	0.01	
1600	SC1/1600 (CV6065)	20	850	750	80	0.01	
1800	SC1/1800 (CV6066)	20	900	800	90	0.01	
2000	SC1/2000 (CV6067)	20	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
→ 350	SC3/350	4.0	250	100	28	0.01	
→ 400	SC3/400	6.0	275	100	32	0.01	
→ 600	SC3/600	8.0	300	100	48	0.01	
→ 800	SC3/800	12	350	100	64	0.01	
→ 1000	SC3/1000	15	400	125	80	0.01	CT1 both ends
→ 1200	SC3/1200	15	450	125	96	0.01	
→ 1400	SC3/1400	15	500	125	112	0.01	
→ 1600	SC3/1600	15	550	150	128	0.01	
→ 1800	SC3/1800	15	575	150	144	0.01	
→ 2000	SC3/2000	15	600	150	160	0.01	
5000	SC5/5000*	25	2000	1000	300	0.02	
6000	SC5/6000* (CV8530)	25	2000	1000	375	0.02	CT1 both ends
6800	SC5/6800*	25	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	

→ New type.

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

SC6 between 10 and 14.9 kV 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.

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Vacuum Capacitors

Vacuum Capacitors

Glass, variable
Ceramic, variable
Glass, fixed
Ceramic, fixed



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 27 MHz (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	25	MA126, MA522☆
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
12-500	U500A/10/40J	UCSF500	10	40	22.5	MA52, 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
5.0-650	U650/3/40A	—	3.0	40	Pull rod	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

→ New type.

‡ Up to 16 MHz.

□ Up to 32 MHz.

◇ Up to 30 MHz.

☆ Supplied with the capacitor.

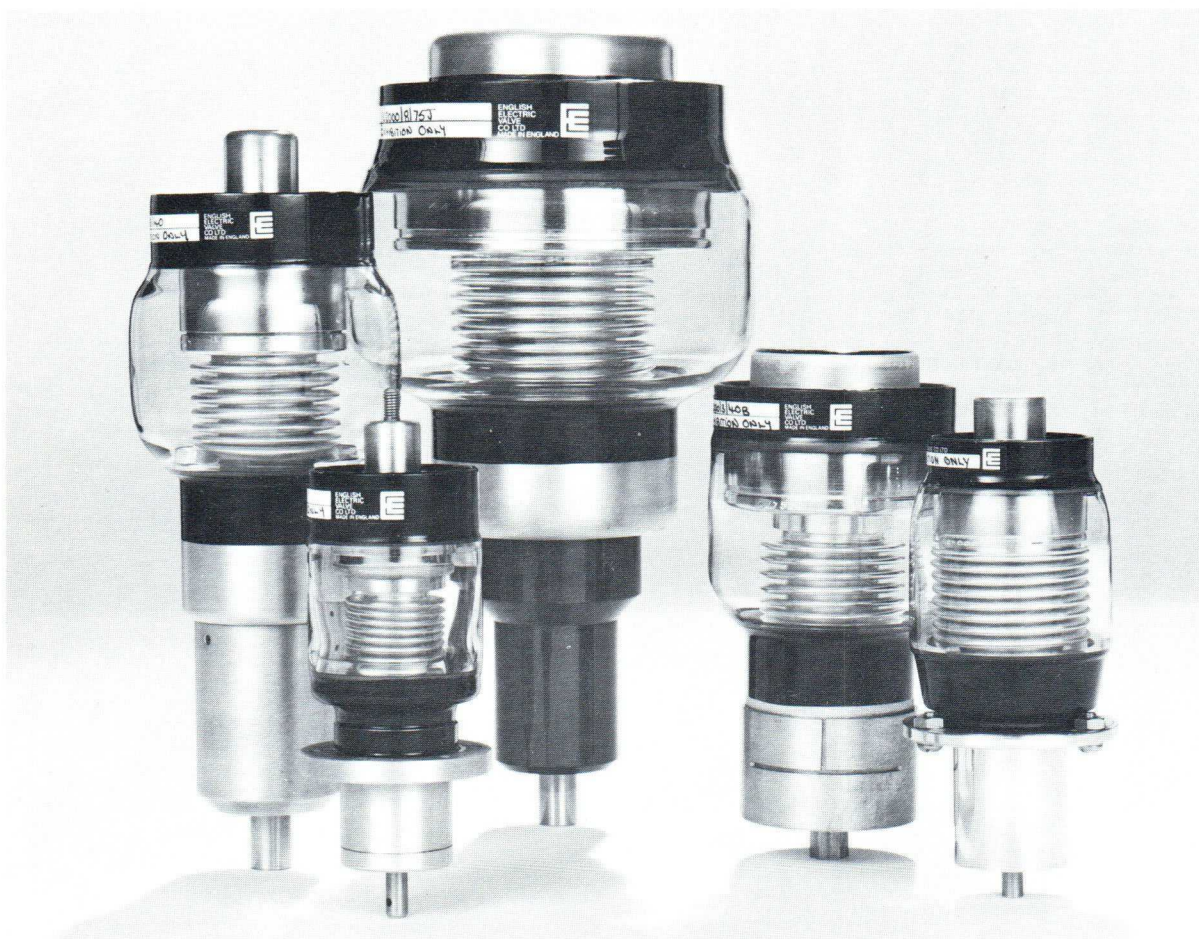
† 21 turns over extended range.

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 27 MHz (A.r.m.s.)	Shaft turns in range	Mounting flange
7.0-1000	U1000/3/40C	—	3.0	40	15.5	MA52, MA296
20-1000	U1000/10/75J	UCSX1000	10	75	36	MA54, MA125
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
50-2100	U2100/8/75	—	8.0	75	33.5	MA54, MA126
15-3000	U3000/3/40J	UCSL3000	3.0	40	26	MA52, MA125
15-3000	U3000/3/40JA	UCSL3000	3.0	40	Pull rod	MA100A

Vacuum Capacitors

Glass, variable
Ceramic, variable
Glass, fixed
Ceramic, fixed



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 16 MHz ($A_{r.m.s.}$)	Shaft turns in range	Mounting flange
7-500	UCM500/5/25	CMV1-500	5.0	25	19	Integral, metric fittings
7-500	UCM500A/5/25	CMV1-500	5.0	25	Pull rod	Integral
12-2000	UCM2000/5/40	CMV1-2000	5.0	45	Pull rod	Integral
20-2000	UCM2000A/5/40	CMV1-2000	5.0	45	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 27 MHz ($A_{r.m.s.}$)	Shaft turns in range	Mounting flange
15-250	UC250/20/125	—	20	125	33	Integral
15-250	UC250/25/125J	CVFP250	25	125	28	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	UC450/25/125J	CVFP450	25	125	37	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	44.5	Integral
20-750	UC750/20/150JA	CVFP750	20	150	Pull rod	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	50	Integral
35-1000	UC1000/20/150JA	CVFP1000	20	150	Pull rod	Integral
60-1000	UC1000/30/150J	CVHP1000	30	150‡	62	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
100-2000	UC2000/20/150J	CVFP2000	20	150‡	65	Integral
50-2300	UC2300/8/125J	CVDP2300	8.0	125	35	Integral
50-2300	UC2300/8/125JB	CVDP2300	8.0	125	Pull rod	Integral
50-2300	UC2300/10/125J	CVDP2300	10	125	35	Integral
25-2500	UC2500/5/60J	CVCC2500	5.0	60	Pull rod	Integral

→ New type.

* Adaptor kit available for EEV type.

‡ Up to 16 MHz.

EEV High Vacuum Variable Capacitors - Water Cooled

Capacitance range (pF)	Type	Equivalent	Peak r.f. working voltage max. (kV)	R.F. current max. up to 16 MHz (A _{r.m.s.})	Shaft turns in range	Mounting flange
30-650	UCW650/30/500	CV3W650E	30	500	52	Integral ←
100-1000	UCW1000/30/500	CV3W1000	30	500	25	Integral ←
30-1200	UCW1200/20/500	CV2W1200E	20	500	52.5	Integral ←



Vacuum Capacitors UF 1000/8/75, 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 27 MHz (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	UF25/10/40	JCS1-25	10	40	MA164
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
1000	UF1000/8/75	-	8.0	75	MA125

Vacuum Capacitors

Glass, variable
Ceramic, variable
Glass, fixed
Ceramic, fixed

EEV High Vacuum Fixed Capacitors - Ceramic Envelope

Capacitance (pF)	Type	Equivalent	Peak r.f. working voltage max. (kV)	R.F. current max. up to 27 MHz (A _{r.m.s.})	Mounting flange
6.5	UFC6/30/140J	CFHE6.5	30	140	Integral
12	UFC12/30/140J	CFHE12	30	140	Integral
12	UFC12/32/100	K12/2L	32	100	—
16	UFC16/32/100	K16/2L	32	100	—
18.5	UFC18/30/140J	CFHE18.5	30	140	Integral
25	UFC25/30/140J	CFHE25	30	140	Integral
25	UFC25/32/100	K25/2L	32	100	—
34	UFC34/30/140J	CFHE34	30	140	Integral
40	UFC40/30/140J	CFHE40	30	140	Integral
43	UFC43/30/140J	CFHE43	30	140	Integral
50	UFC50/30/140J	CFHE50	30	140	Integral
50	UFC50/32/100	K50/2L	32	100	—
76	UFC76/30/120J	CFHD76	30	120	Integral
100	UFC100/15/80	—	15	80	Integral
100	UFC100/15/140	—	15	140	Integral
100	UFC100/24/100	K100/2L	24	100	—
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
450	UFC450/30/200J	CFHP450	30	200‡	Integral
500	UFC500/12/125J	CFED500	12	125‡	Integral
500	UFC500/15/125J	CFED500	15	125‡	Integral
→ 700	UFC700/15/125	—	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	UFC1500/20/200	—	20	200‡	Integral
2000	UFC2000/20/200J	CFHP2000	20	200‡	Integral

‡ Up to 16 MHz.

→ New type.

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Microwave Tubes

Microwave Tubes

Duplexer Devices
 Noise Generators
 Pressure Windows
 Monitor Diodes
 Klystrons
 Magnetrons
 Travelling Wave
 Tubes
 Backward Wave
 Oscillators



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 -3 dB (μ s)
2755-2915	BS718 (CV2378)	0.005	—	—	25†
2755-2915	BS720 (CV2379)	3 W	—	—	25†
2000-4000	(CV294) BS710 (CV2157)	2.0	—	—	10†
2600-3950	BS714 (CV6129)	0.005	5 W	—	30
2600-3950	BS732 (CV5398)	0.005	—	—	16†
2600-3950	BS716 (CV2430)	0.5	0.5	—	15†
2600-4100	BS724* BS726* BS728* (CV2488)	15 W	15 mW	500 mW	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
S-Band	BS702 (CV2285)	2.5	—	10	30†

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 -3 dB (μ s)
			Spike (nJ/pulse)	Total (W)			
1215-1370	BS874	1000	700	1.0	1.25	0.4	5.0
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	0.2	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
1200-1415	BS854	15	1.0	1.0	1.4	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 -6 dB.

* Supplied as matched set of 3 tubes.

♣ Coaxial.

Any 100 MHz band.

†† Twin tube.

☆ Half height waveguide.

‡ Frequency range preset to customer requirements.

□ Any 50 MHz band.

● Primerless.

◆ Tunable marine radar.

■ High Q, tunable.

◇ To -1 dB.

★ Fixed tuned device with gas tube, double PIN switch and trigger probe.

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 -3 dB (μ s)
			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
2700-3200	BS868	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 -3 dB (μ s)
			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	0.5	15
2840-3100	BS800	1250	25	100	1.2	0.8	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
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
S-Band‡	BS902 ■	100	5.0	—	—	1.0	5.0

EEV Coaxial Solid State Limiter - S-Band

Frequency range (MHz)	Type	Description
2700-3100	BS348	For use after BS824 or equivalent. Reduces spike by 18 dB minimum.

→ New type.

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave Tubes
Backward Wave Oscillators

EEV Primerless TR Limiter Tubes - S-Band

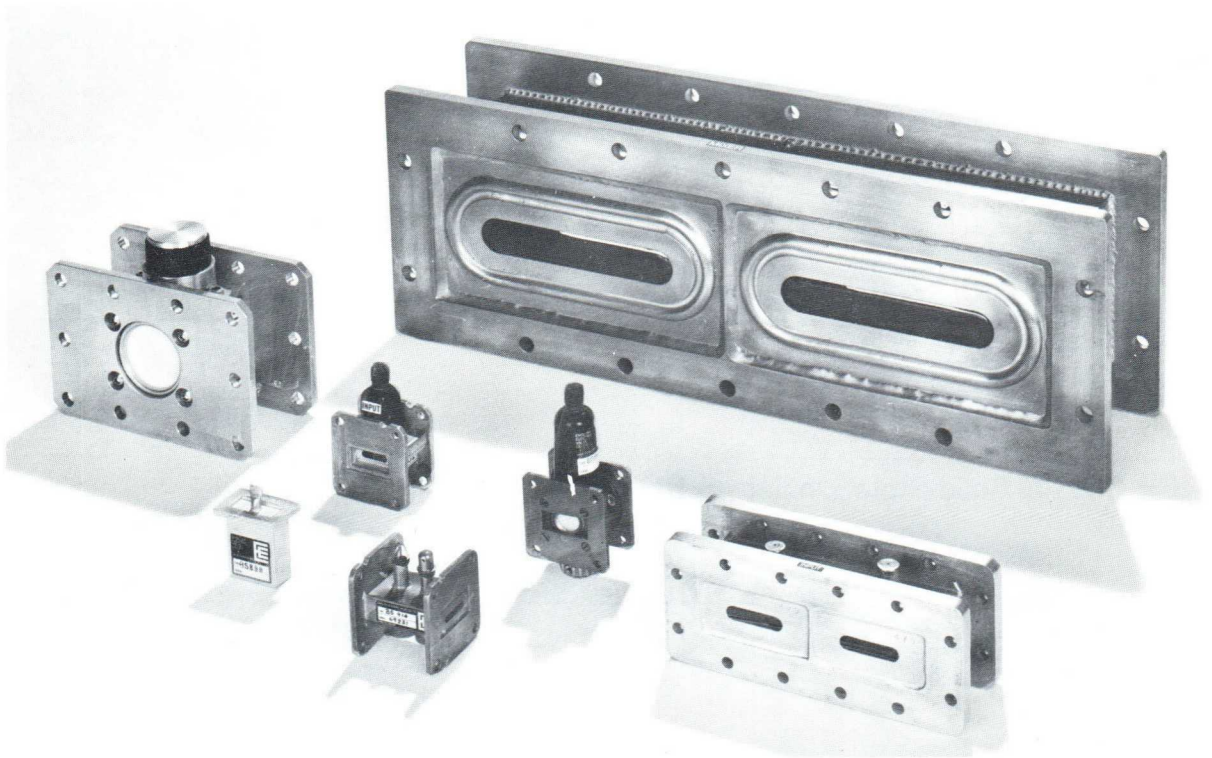
Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to -3 dB (μ s)
			Spike (nJ/pulse)	Total (mW)			
2750-2860	BS102	1250	6.0	100	1.2	0.8	15
3030-3070	BS194	1000	2.0	20	1.3	0.8	10

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 -3 dB (μ s)
			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	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 -3 dB (μ s)
			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 -3 dB (μ s)
			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 -3 dB (μ s)
			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
8500-9500	BS915 (CV6169)	50	30	100	1.4	1.0	0.5†
8825-9225	BS860	100	15	100	1.3	0.8	1.4†
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
9330-9420	BS192	100	15	100	1.3	0.8	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	BS320 ††	250	10	15	1.3	1.0	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
9310-9510	BS452	100	15	100	1.3	0.8	1.4†
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 -6 dB.

†† Twin tube.

‡‡ Twin tube, E-plane.

* Controlled phase recovery.

** Two primers.

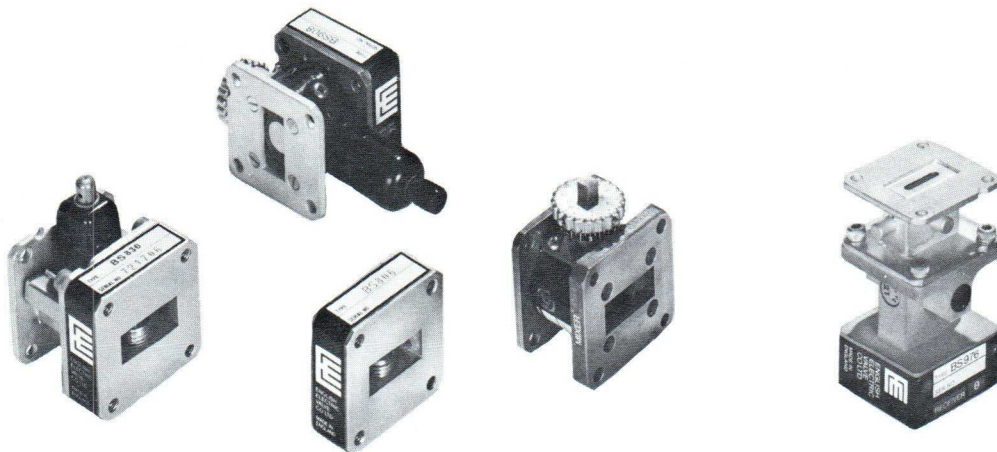
◆ Tunable marine radar.

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave
Tubes
Backward Wave
Oscillators

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 -3 dB (μ s)
			Spike (nJ/pulse)	Total (mW)			
8900-9100	BS162	40	5.0	30	1.4	0.8	3.0
→ 8600-9500	BS234	200	5.0	80	1.4	1.2	3.0
8980-9180	BS500	100	5.0	30	1.4	1.0	3.0
→ 9000-9500	BS276	200	5.0	30	1.4	0.8	3.0
→ 9000-9500	BS277	200	5.0	30	1.4	0.8	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.					
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	BS217	100	5.0	30	1.4	0.8	3.0
9275-9525	BS178	40	5.0	30	1.3	0.8	3.0
9300-9500	BS188	100	5.0	20	1.3	0.8	3.0
9300-9500	BS206	100	10	30	1.4	1.0	3.0
9300-9500	BS256	100	5.0	30	1.4	0.8	1.5
9300-9500	BS260	100	5.0	30	1.4	0.8	3.0
9300-9500	BS262	100	5.0	30	1.4	0.8	3.0
9300-9500	BS280	100	5.0	30	1.4	0.8	3.0
9300-9500	BS958	40	5.0	30	1.4	0.8	3.0
9300-9500	BS959	40	6.0	50	1.4	0.8	3.0
9300-9700	BS216	40	5.0	30	1.4	0.8	3.0
9400-9700	BS232	40	5.0	30	1.4	0.8	3.0
→ 9600-9700	BS219	100	5.0	30	1.4	0.8	3.0



A group of Duplexer Devices

→ New type.

‡‡ Twin tube, E-plane.

◆ Tunable marine radar.

* At 3 μ s.

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 -3 dB (μ s)
			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
8500-9500	BS828	200	2.0	30	1.3	1.0	1.0
9000-9500	BS969	50	3.0	30	1.3	1.0	3.0
9000-9500	BS975 ‡‡	150	3.0	30	1.3	1.0	3.0
9000-9500	BS977	Matched pair of BS969 and BS975 for use in monopulse radars.					
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	BS830	200	2.0	30	1.3	0.7	3.0
9250-9550	BS908 ◆	75	2.0	20	1.4	1.0	6.0
9310-9510	BS454	200	2.0	30	1.3	0.8	3.0
9310-9510	BS815	200	2.0	30	1.3	0.8	3.0
9310-9510	BS844	100	2.0	30	1.3	1.0	3.0
9500-9700	BS826 (CV6207)	200	1.2	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 2.0 μ s (dB)
8775	BS118 (CV2309)	4-50	6.5	1.1	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	3.0*
9325	BS116 (CV2308)	4-50	6.5	1.1	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	3.0*
9410	BS48 (CV460)	4-50	6.0	1.1	0.1	2.0
9600	BS114 (CV2274)	4-50	6.5	1.1	0.1	2.0
9850	BS148	4-50	6.5	1.1	0.1	2.0

EEV Primerless Protector Tube - J (Ku) Band

Frequency range (MHz)	Type	Peak power (kW)	Maximum leakage		Maximum V.S.W.R.	Maximum insertion loss (dB)	Maximum recovery period to -3 dB (μ s)
			Spike (nJ/pulse)	Total (mW)			
16000-17000	BS927	100	150	300	1.4	0.8	3.0

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave Tubes
Backward Wave Oscillators

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)
3050	BS168	150	50	0–16	0.4
C-Band*	BS306	200	50	0–16	0.4
→ 9310	BS807 ††	200	50	0–28	0.6
→ 9750	BS166	300	130	0–28	0.75
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
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 –3 dB (μs)□
			Spike (nJ/pulse)	Total (mW)			
30000–36000◇	BS60 ☆	75	2.0	40	1.3	1.5	0.3
30000–36000◇	BS70 ★	75	2.0	40	1.3	1.5	0.3
30000–36000◇	BS80	75	20	50	1.3	1.0	0.3
34550–35250	BS72 ★	50	2.0	—	1.3	1.3	0.3
34550–35250	BS76	50	15	—	1.3	1.0	0.3

EEV Solid State Microwave Switches

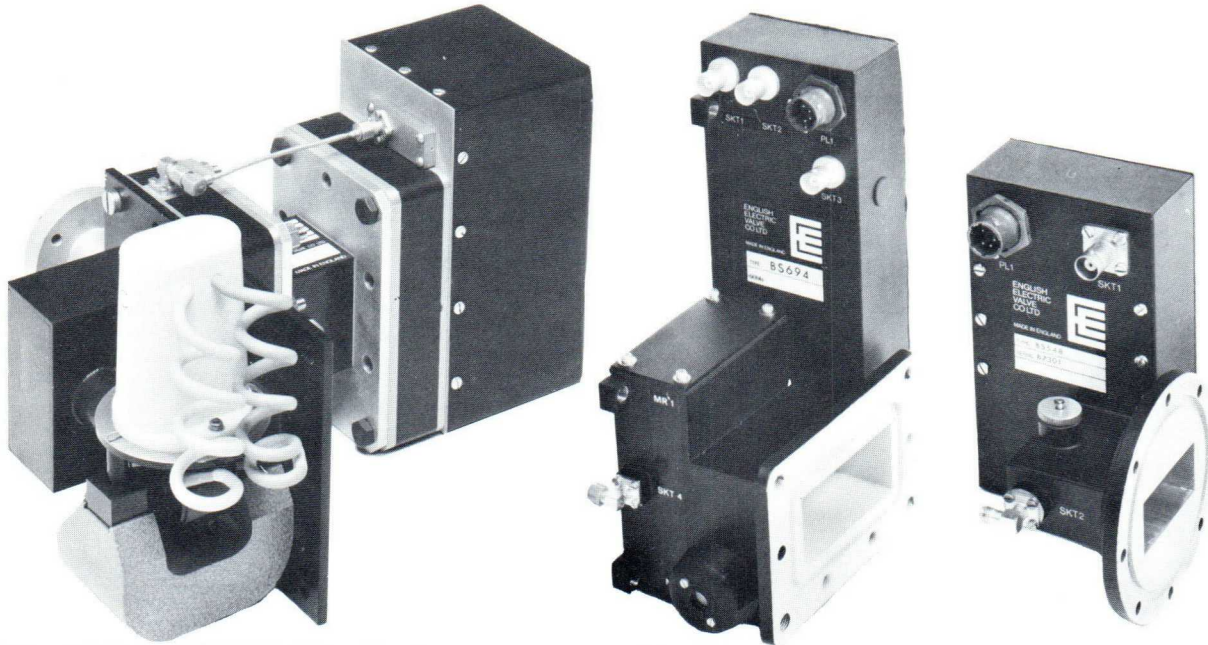
Frequency range (MHz)	Type	Bandwidth (MHz)	Attenuation at centre frequency (dB)	Maximum peak pulsed line power (W)	Typical operating voltage (V)	Maximum operating current (mA)
2925–3075	BS392	150	0.25–25	500	0.85	30
2940–3060	BS864	120	0.25–8.0	500	0.85	50
S-Band*	BS338	200	1–25	500	0.85	30
3230–3380	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

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 17 GHz. The basic balanced duplexer consists of two 3 dB 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 to -3 dB (μ s)	Insertion loss (dB)
1215-1365	BS624	BS910	2.0	1.3	12	0.5
		BS912	6.0	1.3	20	0.5
2700-3100	BS608	BS916	2.0	1.25	20	0.4
5250-5710	BS630	BS858	1.0	1.3	15	0.7
8500-10000	BS616	BS930	0.2	1.4	2.0	0.8



S-Band R.F. Head BS1002, Mixer Receivers BS694 and BS548

EEV R.F. Heads and Mixer Receivers

EEV can supply a range of compact, low noise r.f. heads and mixer receivers in the frequency range 1.0 to 10 GHz, for applications ranging from marine radar to sophisticated military systems. The r.f. head is supplied complete with magnetron, duplexer (conventional T, balanced or circulator), TR limiter, balanced or single ended mixer, local oscillator (Gunn diode or transistor, depending on frequency) and 1st stage i.f. amplifier. A.F.C. and a.g.c. facilities can be included if required.

All systems are designed by EEV to meet customers specific requirements.

The characteristics of a typical S-band r.f. head type BS1002 are given below; the r.f. head includes 25 kW magnetron type M5020, duplexer BS748, TR tube BS894, varactor limiter BS168, mixer receiver BS582 and local oscillator BS307.

Frequency range (MHz)	Type	Peak output power (kW)	Overall noise factor (dB)	I.F. gain (dB)	Electronic tuning range (MHz)	I.F. frequency (MHz)	I.F. output impedance (Ω)
3040-3060	BS1002	25	7.0	30	60	30	50

The characteristics of two typical mixer receivers are given below.

Frequency range (MHz)	Type	Overall noise figure (dB)	Overall gain (dB)	Output into 50 Ω (mW)
2600-3500 \diamond	BS694	5.5	60	20
5450-5825	BS548	7.5	30	15

\diamond 10% bandwidth.

\square Dependent on power level.

\star Primerless TR limiter.

\star Primed TR limiter.

\star Preset to customers' requirements.

$\dagger\dagger$ Double varactor limiter.

\rightarrow New type.

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave Tubes
Backward Wave Oscillators

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 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	Terminated	★	★	★
3100—3500	BS676	16	R32	Transmission	10	23	BS690, BS692
5450—5825	BS756	15	R48	Transmission	15	23	BS690, BS692
8500—9100	BS660	16	R100	Transmission	30	21	BS690, BS692
8800—9200	BS658	16	R100	Transmission	30	21	BS690, BS692
9000—9600	BS662	16	R100	Transmission	30	21	BS690, BS692
9000—9600	BS750	20	R100	Transmission	40	23	BS690, BS692
9335—9485	BS784	15	R84	Transmission	20	24	BS690, BS692
9300—9700	BS640	16	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	R140	Transmission	35	23	BS690, BS692
33000—36000†	BS648	25	R320	Terminated	32	—34	—
34750—35250	BS758	25	R320	Terminated	35	—34	—

EEV Solid State Noise Generators - Coaxial

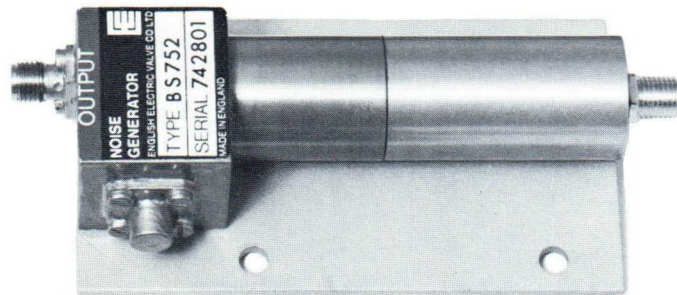
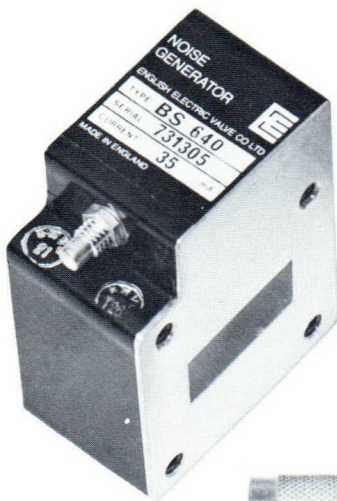
Frequency range (MHz)	Type	Excess noise ratio (dB)	Output connector	Transmission or terminated	Operating current (mA)	Typical voltage (V)	Power supply type
1000—4000	BS644	27	N	Terminated	15	21	BS690, BS692
2700—3200	BS776	25	SMA	Terminated	10 max	28	—
2990—3110	BS788	37 min	N	Terminated	3.0	21	BS690, BS692
2700—3500	BS762	32	N	Terminated	10	21	BS690, BS692
3000—3500	BS698	27	N	Terminated	15	21	BS690, BS692
4500—5500	BS760	25	SMA	Terminated	15 max	28	—
1000—10000	BS646	16	N	Terminated	20	22	BS690, BS692
9500—10000	BS752	36	SMA	Terminated	30	22	BS690, BS692
9800—10000	BS778	36	SMA	Terminated	30 max	28	—

- † 1 GHz bandwidth.
‡ 5% bandwidth.
★ Integral power supply.

- BS620 is supplied with noise tube BS386 but calibrated to an accuracy of ± 0.1 dB.

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
7000-10000	BS638	BS342	15.7	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



Solid State Noise Generators

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)	Resonant frequency (MHz)	Type	Bandwidth at v.s.w.r. 1.2:1 (MHz)	Peak power max. (kW)
1300	BS50L	60	500	5550	BS50CA	180	100
2425	BS50SA	120	150	5700	BS50CB	180	100
2790	BS50SB	50	50	8775	BS50XA	600	80
2935	BS50SC	80	150	9025	BS50XB	600	80
3000	BS50SD	120	150	9080	BS50XC	600	80
3005	BS50SE	120	150	9240	BS50XD	600	80
3085	BS50SF	80	150	9375	BS50XE	600	80
3200	BS50SG	120	150	9410	BS50XF	600	80
3285	BS50SH	80	150	9600	BS50XG	600	80
3520	BS50SJ	80	150	9750	BS50XH	600	80
				9850	BS50XJ	600	80

Microwave Tubes

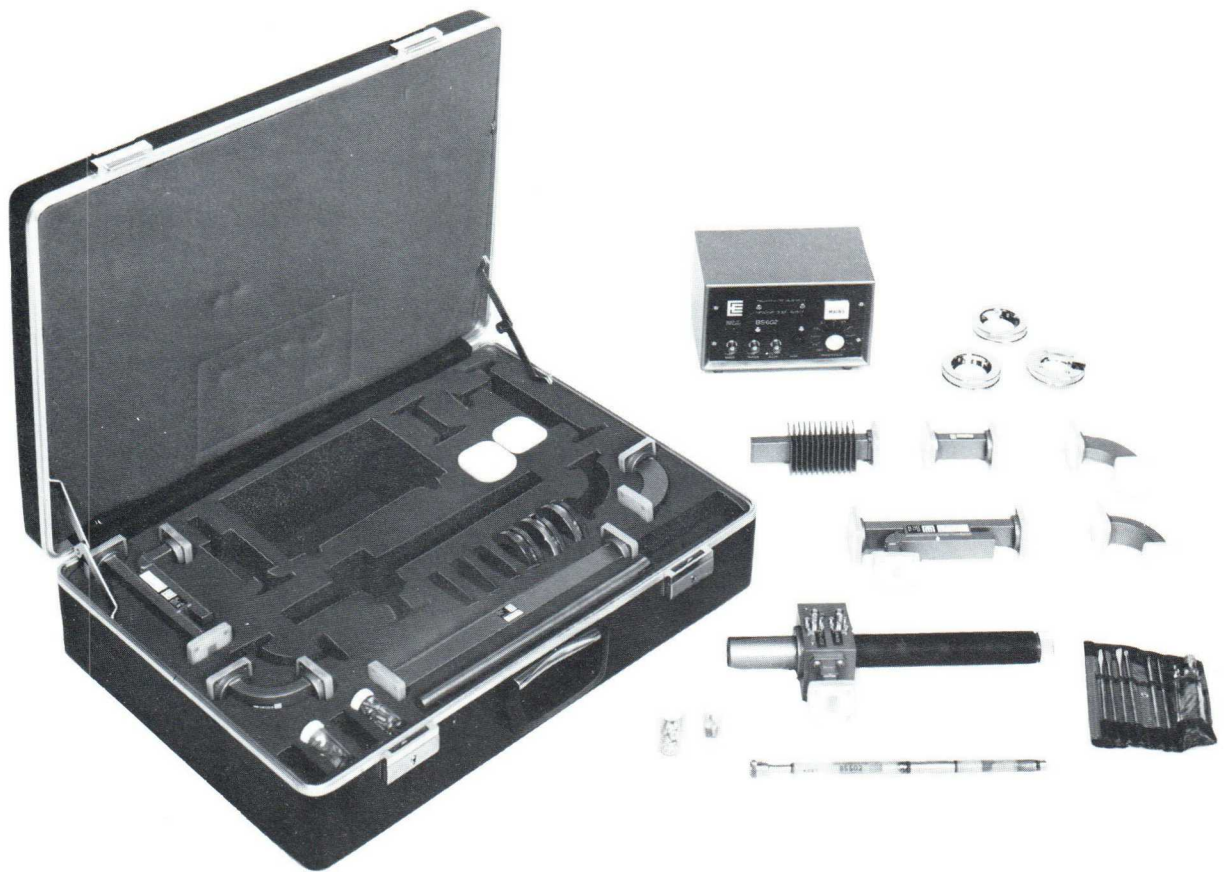
Duplexer Devices
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Backward Wave Oscillators

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) (μ s)	Diode load (Ω)	V.S.W.R. (max)	Mount
2500–6500	BS510 (CV6107)	20	18	15	68	1.5	BS514, BS516 BS522, BS524 BS526, BS530 BS532, 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 BS602A or power supply and indicator unit type BS600 is available for use with the above types.



Monitor Diode Kit BS614

EEV Monitor Diode Kits

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.
→ BS366	Similar to BS614 but covers the frequency range 9100–9800 MHz, with a peak power range up to 1 MW.
BS504	Similar to BS614, with different ancillaries and with solid state noise generator for noise figure measurements.

→ New type.

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
8.80†	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
8.50–9.60	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
9.35–9.55	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
9.555–9.685	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
10.50–10.70	K3076 §	60	30	300	Octal	Low power doppler
16.50–17.50	K3080 § ☆	65	70	330	Leads	Paramp pump
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

§ 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 ± 5 V.

* Preset to this frequency.

■ Made to special order only.

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave
Tubes
Backward Wave
Oscillators

EEV Amplifier Klystrons - CW Operation for Television Service

Output power [⊕] (kW)	Type	Mechanical tuning range (MHz)	Cavities	Typical Operation			Cooling (see foot of page)	Circuit assembly
				Drive power [‡] (W)	Beam voltage (kV)	Beam current (A)		
6.0	K383■	470-610	4, Separate	1.0	9.5	1.9	1	K4140
6.0	K384■	590-720	4, Separate	1.0	9.5	1.9	1	K4141
6.0	K385■	700-860	4, Separate	1.5	9.5	1.9	1	K4142
7.0	K3004■	470-610	4, Separate	1.0	10.5	2.2	1,3	K4145
7.0	K3005■	590-720	4, Separate	1.0	10.5	2.2	1,3	K4146
7.0	K3006■	700-860	4, Separate	1.0	10.5	2.2	1,3	K4147
11 [♣]	K365■	400-610	4, Separate	5.0	17.0	1.8	1,2	K4019A
11.5	K370	470-606	4, Separate	1.0	12.5	2.8	1,3	K4145
11.5	K371	606-742	4, Separate	1.0	12.5	2.8	1,3	K4146
11.5	K372	742-854	4, Separate	1.0	12.5	2.8	1,3	K4147
→ 12.5	K370W	470-608	4, Separate	1.0	12.5	2.8	1,2	K4195
→ 12.5	K371W	606-742	4, Separate	1.0	12.5	2.8	1,2	K4196
→ 12.5	K372W	740-890	4, Separate	1.0	12.5	2.8	1,2	K4197
28	K376	470-610	4, Separate	2.0	18.0	4.6	1,2	K4201
28	K377	590-720	4, Separate	1.0	18.0	4.6	1,2	K4202
45	K3282	470-610	4, Separate	0.9	22.0	6.2	1,2,3	K4170
45	K3283	590-720	4, Separate	0.9	22.0	6.2	1,2,3	K4171
45	K3284	700-860	4, Separate	0.9	22.0	6.2	1,2,3	K4172
28 45	K3217H	470-590	4, Separate	3.1 3.5	17.5 21.5	4.5 5.25	1,2,3	K4170
28 45	K3218H	590-702	4, Separate	3.1 3.0	17.5 21.5	4.5 5.25	1,2,3	K4171
28 45	K3219H	702-860	4, Separate	3.1 4.0	17.5 21.5	4.5 5.25	1,2,3	K4172
58	K3276H	470-596	4, Separate	5.0	24.0	6.0	1,2	K4201
→ 58	K3277H	590-704	4, Separate	5.0	24.0	6.0	1,2	K4202
→ 58	K3278H	702-860	4, Separate	5.0	24.0	6.0	1,2	K4203

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

Power Klystron Cooling

- 1 Forced-air cooled.
- 2 Water cooled.
- 3 Vapour cooled.

♣ Bandwidth 6 MHz.

‡ Bandwidth 8 MHz.

→ New type.

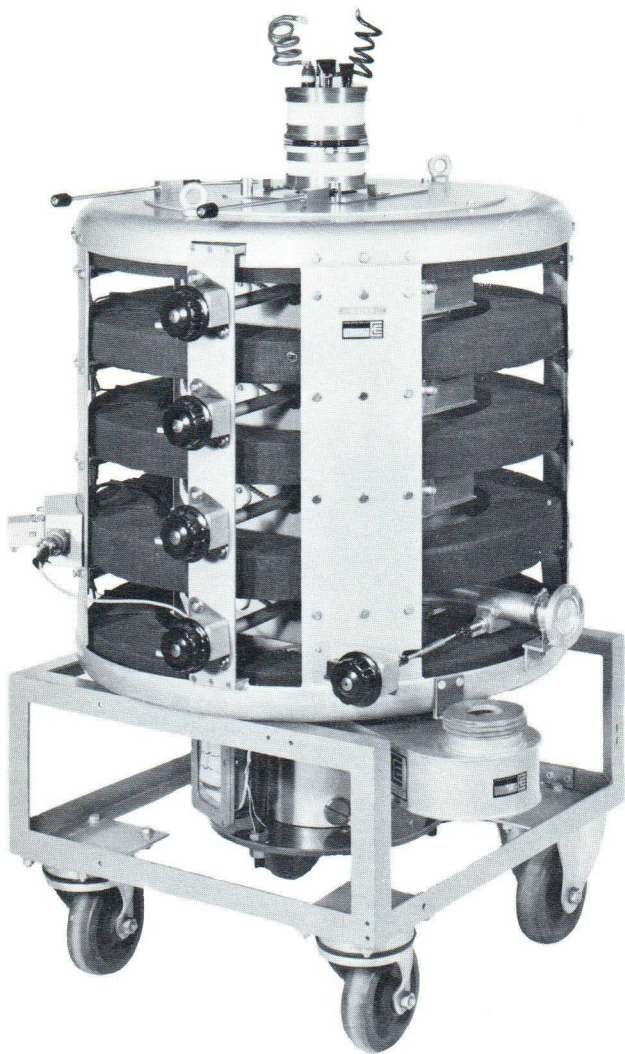
⊕ At klystron output flange.

■ 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 page 42)	Circuit assembly
			Drive power (W)	Beam voltage (kV)	Beam current (A)			
2.8	3K3000LQ	610–985	10	9.0	0.6	1	—	
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	
11.5‡	K386W	755–985	0.5	12	2.7	1,2	K4148W	
12	4KM50,000LR	755–985	0.05	17	1.8	1,2	—	

Note Beam perveance of K386 and K386W is 2×10^{-6} ; perveance of other types listed above is 1×10^{-6} .



Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave Tubes
Backward Wave Oscillators

Typical Amplifier Klystron Mount and Tube

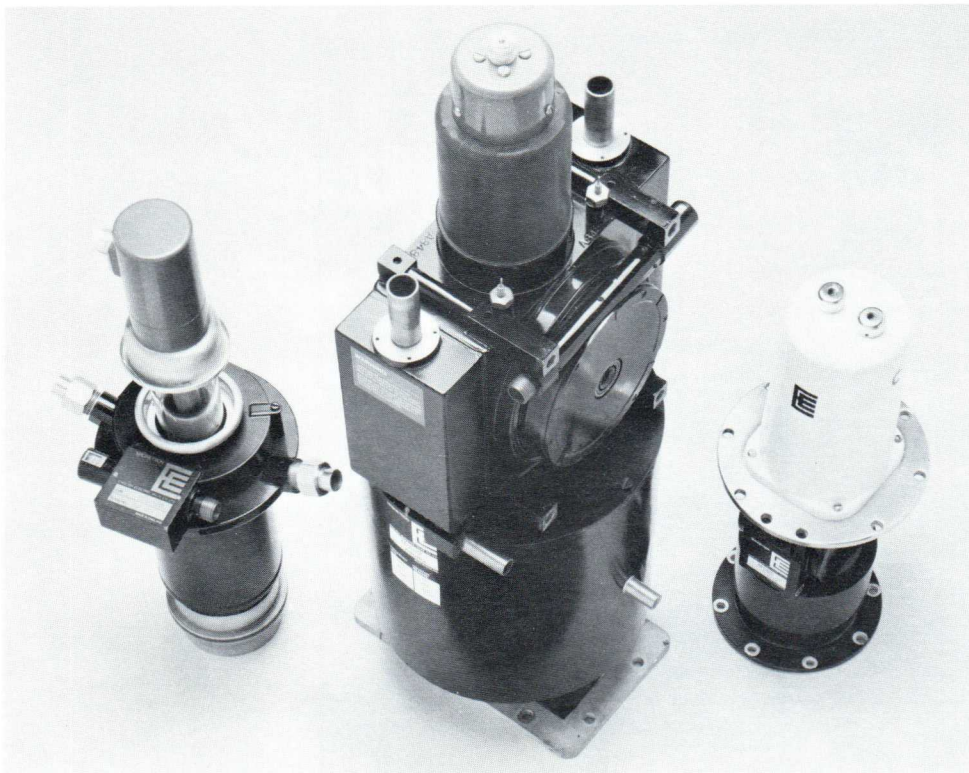
EEV Amplifier Klystrons - Pulse Operation

Output power (peak) (kW)	Type	Mechanical tuning range (MHz)	Gain (dB)	Pulse duration (μ s)	Pulse repetition rate (p.p.s.)	Beam voltage (peak) (kV)	Beam current (peak) (A)	Cooling (see foot of page 42)	Focus
600	K347A	580–615	33	6.0	400	75	20	1	Electro-magnet

EEV CW Magnetrons

Fixed frequency types

Typical output power (kW)	Type	Frequency range (MHz)	Typical operation			Class (see foot-notes)
			Anode voltage (kV)	Anode current (A)	Load V.S.W.R. max	
→ 25◇	RM174♣ RM174A♣	896 ± 15□	12.6	2.8	2.5:1	EWAZ
→ 25◇	RM101	915 ± 15‡	12.6	2.8	2.5:1	EWAZ
25◇	BM25LE	915 ± 10‡	12.5	2.4	2.5:1	EWAZ
→ 30	RM157	915 ± 10‡	12.5	2.9	2.5:1	EWAZ



Magnetrons M5028, M5051, M5125

EEV Pulse Magnetrons for Particle Accelerators

All types tunable over their specified frequency ranges.

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation				Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	
2000	M5125	2993–3002	43	100	4.0	0.001	SWX
→ 2500	RM104☆	2990–3010	45	110	3.6	0.0013	PWG
2600	M5167	2992–3001	47	110	4.0	0.00084	SWX
→ 2600	M5193	2992–3001	47	110	4.0	0.0012	SWX
5500	M5028★	2851–2861	51	240	2.3	0.00055	EWAZ

◇ 30 kW under matched load conditions.

‡ Mechanically tuned over the specified frequency range.

▲ Circular to rectangular waveguide transition section M4016 available.

⊕ Encapsulated to reduce stray radiation.

♣ Identical apart from external fittings.

¶ Mechanically tuned over 15 MHz, centre frequency within this range.

★ Water cooled electro-magnet and launching section assembly M4121 available.

□ For U.K.

‡ For U.S.A.

♣ Improved tuner mechanism.

■ Made to special order only.

☆ Coaxial magnetron.

→ New type.

EEV Pulse Magnetrons - L-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation			Duty cycle	Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)		
2300	M5084■	1250–1310†	39	150	5.0	0.0015	SWAG
	M5085■	1305–1365†					
2300	M5086■	1250–1310†	39	150	5.0	0.0015	SAG
	M5087■	1305–1365†					
2300	M5051	1250–1310†	39	150	5.0	0.0015	SVAG
	M5052	1305–1365†					
2600	M554▲	1295–1365	39	150	5.0	0.00125	SWX
	M586▲	1260–1300					
2600	M5169▲	1295–1365¶	39	150	5.0	0.00125	SWX
5000	M565■	1215–1365	48	240	10	0.0025	EWAZ

EEV Pulse Magnetrons - S-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation			Duty cycle	Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)		
25	2J70A	3025–3075	7.0	8.0	1.0	0.001	PANC
25	M5020	3040–3060	8.0	8.0	0.55	0.00055	PANG
50	M5063/2J70B	3025–3075	9.0	15	0.3	0.0006	PANC
55	M5145	3025–3075	9.3	15	0.55	0.00055	PAG
500	M5126A	3100–3300†◆	29	42	1.5	0.001	SAC
750	M5094	2700–2900†	30	64	1.5	0.0006	SAC
830	M5083A⊕	2700–2900†◆	30	64	1.5	0.0006	SAC
	M5091A⊕	2900–3100†◆					
900	4J43	2992–3019	28	70	1.0	0.0005	SAC
	4J44	2965–2992					
900	M577B (CV10210)	3000–3040	28	70	1.0	0.0005	SAC
	M578B	3060–3100					
900	M5079A	3100–3300†	32	70	1.0	0.0005	SAC
900	M5113	2900–3100†	30	70	1.0	0.0005	SAC
1000	4J31 (CV1914)	2860–2900	28	70	1.0	0.0005	SAC
	4J32	2820–2860					
	4J33 (CV1916)	2780–2820					
	4J34 (CV1897)	2740–2780					
	4J35 (CV1898)	2700–2740					
	4J53 (CV513)■	2793–2813					
	CV2744	2740–2765					
	M595B (CV8905)	2860–2900					

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

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave
Tubes
Backward Wave
Oscillators

EEV Pulse Magnetrons - S-Band continued

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation				Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μ s)	Duty cycle	
1000	5586 (CV3611) 5657 (CV3958)	2700–2900† 2900–3100†	30	70	1.0	0.0005	SAC
1000	M5030A M5034A	2900–3050† 3050–3200†	31.5	70	2.0	0.002	PAG
1000	M5035 (CV11154) M5114B M5162‡ M5170‡	2900–3100† 2700–2900† 2700–2900† 2900–3100†	30	70	1.0	0.0005	SAC
→ 1000	RM160*	3100–3200†	35	60	2.0	0.002	PWG
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■ BM1004■ BM1005■	3034–3052 2989–3007 2944–2962	43	90	2.0	0.001	SWX
2500	7182◇	2750–2860	35	157	5.0	0.0015	EWAZ
2500	M566‡ M5133‡‡‡	2750–2860 2750–2860	38.5	145	5.0	0.0015	EWAZ
2500	M569‡ M5134‡‡‡	2850–2960 2850–2960	40	140	5.0	0.0015	EWAZ
2500	M570‡ M5135‡‡‡	2950–3060 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)‡ M5136‡‡‡	3050–3160 3050–3160	38.5	145	5.0	0.0015	EWAZ

EEV Pulse Magnetrons - C-Band

Fixed frequency types

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation				Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μ s)	Duty cycle	
75	RM127	5400 ± 20	15	14	6.0	0.0012	PAG
840	M5032 M5033	5250–5350 5430–5530	34	60	5.0	0.0015	EWAZ

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

† Mechanically tuned over the specified frequency range.

* Required frequency to be specified.

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

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

‡‡ Encapsulated to reduce stray radiation.

‡‡‡ Quick heat cathode.

■ Made to special order only.

◇ Low thermal coefficient of frequency.

¶ Mechanically tuned ± 25 MHz, centre frequency within this range.

§ Rugged.

★ Metal-ceramic construction.

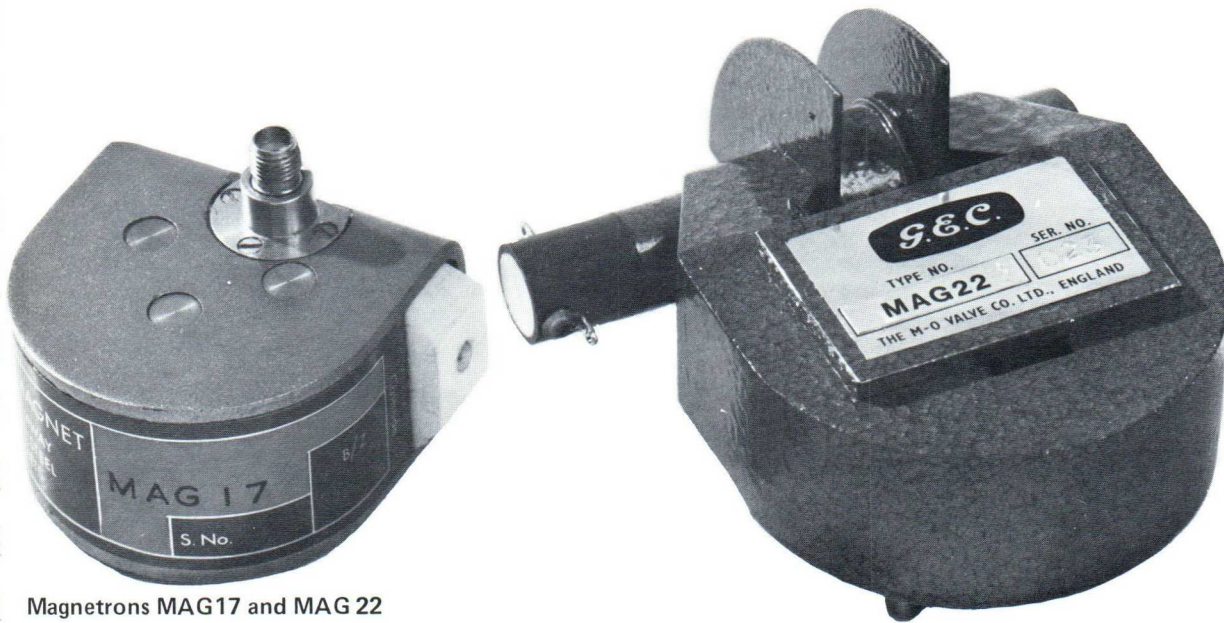
☆ Coaxial magnetron.

→ New type.

M-OV Pulse Magnetrons - X-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation				Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	
0.025	MAG22	8790-8830	0.8	0.15	4.0	0.4	PAG
0.25	MAG20* † § φ	9000-11000	0.85	1.5	0.35	0.005	PBC
0.4	MAG17* § φ	9000-11000	0.85	1.5	0.35	0.005	PBC
2.0	MAG12* * § φ	9000-11000	2.25	3.0	0.25	0.001	PBG
2.5	MAG23A ◊ § φ	9600-9675	2.25	3.0	0.25	0.001	PBG
	MAG23B ◊ § φ	9676-9750					
	MAG23C ◊ § φ	9751-9825					
	MAG23D ◊ § φ	9826-9880					
8.0	MAG15* § φ	9000-11000	5.8	5.0	0.12	0.0015	PBG
130	MAG21A §	9500-9590	17	20	0.25	0.001	PAG
	MAG21B § § §	9555-9645					
	MAG21C § § §	9610-9700					



Magnetrons MAG17 and MAG22

EEV Pulse Magnetrons - X-Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation				Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μs)	Duty cycle	
1.4	M5021*	9380-9440	2.0	2.25	0.5	0.001	PNG
3.0	RM181*	9370-9580	3.6	3.0	0.75	0.0013	PBG ←
3.0	M599F*	9380-9440	3.6	3.0	0.1	0.0002	PNG ←
4.0	M599A*	9415-9475	3.6	3.0	0.1	0.0002	PNG
	M599B (CV10758)*						
4.0	M5064H*	9345-9405	3.6	3.0	0.5	0.0005	PNG
4.0	M5182	9530-9560 ¶	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	4.8	4.5	1.0	0.002	PANG

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave Tubes
Backward Wave Oscillators

EEV Pulse Magnetrons - X-Band continued

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation				Class (see foot- notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μ s)	Duty cycle	
6.75	M5097*	9200–9600 \square	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
→ 7.5	RM107*	9325–9365	4.5	4.5	4.0	0.0013	PBG
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
→ 8.3	M5172*	9345–9405	5.5	4.5	1.0	0.002	PBNG
→ 8.3	M5173*	9345–9405	5.5	4.5	1.0	0.002	PBNG
→ 8.6	RM146*	9374.5–9375.5 \square	4.5	4.77	3.5	0.0011	PBG
9.0	RM126*	9325–9365	4.6	4.75	3.5	0.00084	PBG
9.0	M537A (CV6108)	8770–8830	5.5	4.5	1.0	0.001	PAG
9.0	M5067H	9345–9405	5.5	4.5	2.5	0.001	PANG
9.0	M5117 series	9400–9720 \dagger	5.6	5.0	0.5	0.0005	PANG
→ 9.0	M5175*	9345–9405	5.5	4.5	2.5	0.001	PBNG
→ 9.0	M5176*	9355–9395	5.7	5.75	3.5	0.00035	PBNG
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	RM178*	9775–9825	5.25	5.0	1.0	0.0025	PBAG
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
10.5	RM121*	9325–9365	5.0	5.0	3.5	0.00042	PBG
→ 11	M5174*	9380–9440	6.0	5.5	1.0	0.001	PBNG
→ 11	RM142*	9370–9380	5.0	5.0	2.35	0.00047	PBG
12	RM128*	9250–9800 \ddagger	5.2	5.0	1.0	0.0035	PBAG
→ 13	RM168*	9253–9330 \ddagger 9600–9800 \ddagger	6.2	4.8	1.0	0.001	PAG
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	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	M598B	9380–9440	7.6	7.5	1.0	0.0005	PANG
22.5	M5155\diamond*	9340–9480	8.2	8.0	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	0.001	PANG
25	M5068*	9620–9680	8.2	8.0	1.0	0.0005	PANG

→ New type.

\dagger Mechanically tuned over 40 MHz bands within this range.

\diamond Multipactor tuned.

\ast Coaxial magnetron.

\ddagger Mechanically tuned over the specified frequency range.

\star Metal-ceramic construction.

\square Preset tuning.

\ddagger Long life.

EEV Pulse Magnetrons - X-Band continued

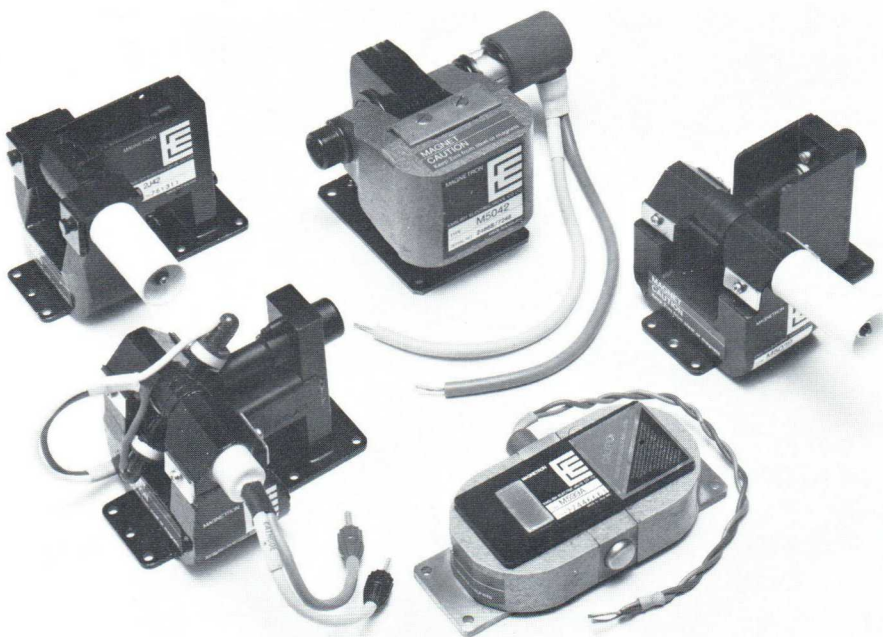
Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation				Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μ s)	Duty cycle	
25	M5111*	9350-9400	8.2	8.0	1.0	0.0005	PANG
25	M5149*	9380-9460†	8.2	8.0	1.0	0.001	PANG
25	M5187*‡	9380-9440	8.2	8.0	1.0	0.0005	PANG
27	M5131	9380-9440	8.0	8.5	1.0	0.001	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
30	M5105*	9455-9495	8.3	9.0	1.0	0.0005	PANG
30	M5191	9850-10150†	10	10	1.0	0.001	PAG ←
30	RM137*	9345-9405	8.0	8.3	1.0	0.0015	PBG ←
40	BM1031 (CV2186)	9420-9500	13	10	1.0	0.001	SAG
45	M521 (CV2376)	9600-9700	11.1	12	1.0	0.001	SAG
48	M5178	9370-9450‡	13	12	4.0	0.0016	PAG ←
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	11.5	12	1.0	0.001	SAG
	M5062	9440-9480					
50	M5075	9005-9035	11.5	12	1.0	0.001	SAG
	M5076	9135-9165					
	M5077	9165-9195					
50	M5142	9385-9435	12.5	12	1.0	0.001	PAG
50	M5156*§	9340-9480	13	12	1.0	0.0004	PAG
53	M5005 (CV9424)	9345-9405	13	12	4.0	0.0016	PAG
	M5005A						

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave Tubes
Backward Wave Oscillators

A group of X-Band Magnetrons



CLASS **Magnetic Field**
P Packaged integral magnet
S Separate magnet

Cooling
A Forced-air
B Conduction
N Natural

Output
G Waveguide

EEV Pulse Magnetrons - X-Band continued

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation				Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μ s)	Duty cycle	
60	BM1026	9505–9540	14	11	0.5	0.001	SAG
	BM1027	9540–9580					
	BM1028	9580–9620					
	BM1029	9620–9660					
	BM1030	9660–9695					
60	BM1038 (CV2261) ■	9050–9600†	14	15	0.1	0.0003	PAG
	BM1039 (CV2262) ■	8500–9050†					
70	BM1032	9440–9510†	17	12	0.5	0.00091	SAG
	BM1033	9800–9860†					
	BM1034	9620–9680†					
	BM1035	9520–9580†					
	BM1036	9245–9305†					
	BM1037	9145–9205†					
→ 73	RM136☆	9310–9320□	13.5	16	2.35	0.001	PAG
→ 75	RM130☆	9370–9380□	12.5	12.5	5.75	0.0011	PAG
75	BM1040 (CV5167)	9040–9120†	15	11	0.5	0.00072	SAG
75	RM117☆	9350–9400	13	12	5.0	0.001	PBAG
75	RM103☆	9325–9365	13	12	6.0	0.0012	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
	M575A	9300–9340					
	M575B	9440–9480					
80	M596	9370–9430	14.8	15	1.0	0.001	PAG
80	M5080	9210–9270	15.5	15	1.5	0.0012	PAG
	M5081	9345–9405					
80	M5157A	9510–9590□	15	15	1.0	0.001	PAG
	M5157B	9610–9690□					
	M5157C	9510–9590†					
	M5157D	9610–9690†					
100	M5042S	9315–9375	15	17.5	5.0	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 (Ku) Band

Fixed frequency type

Peak output power (kW)	Type	Frequency range (GHz)	Typical operation				Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μ s)	Duty cycle	
35	MAG19◇	16.35–16.65	11	10.5	0.5	0.001	PANG

EEV Pulse Magnetrons - J (Ku) Band

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Frequency range (MHz)	Typical operation				Class (see foot-notes)
			Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (μ s)	Duty cycle	
1.0	RM152☆	17500–18000†	3.0	1.6	2.0	0.001	PAG ←
1.2	RM108☆	16000–16500†	3.0	1.6	0.25	0.001	PBAG
1.2	RM143☆	16200–16300†	3.0	1.5	0.25	0.0005	PAG ←
3.0	RM106☆	15400–15700†	3.6	3.0	0.3	0.001	PBG ←
3.5	RM112☆	15400–15700†	3.6	3.0	0.3	0.005	PBG
3.5	RM132☆	15458–15462†	3.5	3.0	0.3	0.0005	PBAG
10	RM177☆	15980–16020	5.0	5.0	1.0	0.0013	PBG ←
40	RM176☆	16000–16500†	14	10	1.0	0.002	PAG ←
80	RM110☆	15950–16050	24	12	0.25	0.00175	PAG ←

EEV Pulse Magnetrons - Millimetre Wave

Fixed frequency types except where otherwise indicated

Peak output power (kW)	Type	Centre frequency range (GHz)	Typical operation				Class (see foot-notes)	
			Tuning range (MHz)	Peak anode voltage (kV)	Peak anode current (A)	Pulse duration (ns)		Duty cycle
1.3	M5154	33–37	—	4.0	1.5	400	0.0016	PBNG
3.0	M5163	94–96	—	10	7.0	50	0.0002	PAG
4.0	M5137	79–81	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	78–82	—	11	5.0	50	0.0002	PAG
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
30	M5171	34.5–38.0	320◆	12.5	12	250	0.0005	PAG ←
40	M5168	34.75–35.25	500†	13.5	17.5	50	0.0004	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	33–36	—	13.5	15.5	100	0.0004	PAG

CLASS

Magnetic Field

E Electro-magnet
P Packaged integral magnet
S Separate magnet

Cooling

A Forced-air
B Conduction
N Natural

Output

G Waveguide

■ Made to special order only.

φ Quick heat cathode.

□ Preset tuning.

☆ Coaxial magnetron.

◆ Frequency agile.

† Mechanically tuned over the specified frequency range.

→ New type.

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave
Tubes
Backward Wave
Oscillators

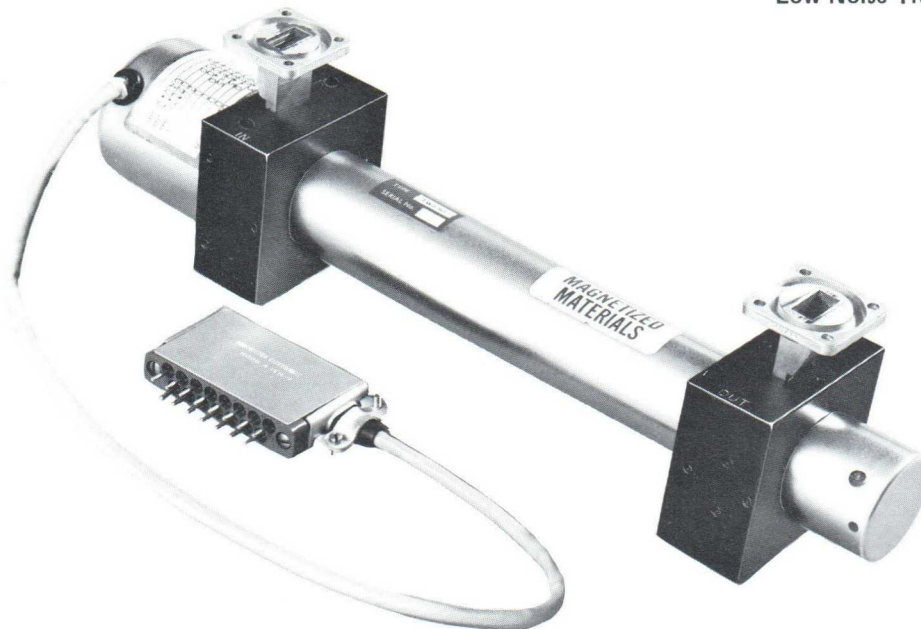
EEV Travelling Wave Tube Amplifiers and Power Supplies

Type	Description
	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 N1072 N1073 N1095
N4173	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 -24 V d.c. are provided to supply power to the receiver and low level transmitter section of microwave relay equipment.
	A high voltage, solid state power supply designed specifically to provide the required voltages and cooling for the following tubes; the tube is mounted within the N4178. N1077 N1080A N1081 N10021
N4182 N4183	Travelling wave tube amplifiers providing a minimum output power of 1 W. Frequency range of N4182 is 5 to 10 GHz with minimum gain of 34 dB; N4183 covers 8 to 16 GHz with minimum gain of 32 dB. The amplifiers are suitable for bench or rack mounting and contain adequate monitoring and protective facilities.
	A high voltage, solid state power supply designed specifically for use in high capacity microwave communication systems. It can be either rack or bench mounted. It provides the voltages required for the following tubes:—
→ N4184 N4184A	N10022 N10023 N10018 N10019

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

Low Noise Travelling Wave Tube TWJ30



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)		
2.7–3.2	N1047M (CV8908)	1.5	4.0	24	800	130	Coaxial	N4041e ■
2.7–3.5	6861 (CV5362)	1.0	6.5	25	400	150	Coaxial	N4004e ■

EEV Travelling Wave Tubes - S-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)		
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★☆
3.55–5.0	N1073 †	16	23	41	1.7	45	Waveguide	N4136★☆
3.6–5.0	N1056 △	17	27	38	2.0	45	Waveguide	N4074□△■ N4075□△■



Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave Tubes
Backward Wave Oscillators

S-Band Travelling Wave Tube N1073 with Mount N4136

M-OV Travelling Wave Tubes - S-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)		
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
2.5–4.1	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⊕

§ 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 3 dB below saturation output power level.

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

→ New type.

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)		
→ 4.4–5.0	N10023 †	12	25	46	1.3	40	SMA	Integral★
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★‡
5.85–7.15	N1055 △	18	27	43	2.0	45	Waveguide	N4085□■△ N4094□■△
5.8–7.2	N1072 †	19	23	44	1.7	45	Waveguide	N4135★☆
5.9–7.4	N10018	12	26	39	1.3	34	Waveguide	Integral▲
5.9–7.4	N10019	12	26	39	1.3	34	SMA	Integral▲
→ 5.8–8.5	N10504	20	22	41	1.3	50	Waveguide	MRW80

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)	10	28	37	1.8	35	Waveguide	PMC5▲
7.4–7.8	TWC5A ■					40		
6.9–7.4	TWC5B ■					40		
6.425–7.11	TWC5C ■					40		
5.925–6.425	TWC14 (CV11039)	18	27	36.5	1.8	45	Waveguide	PMC14▲
7.4–7.8	TWC14A ■	15		33				
6.9–7.4	TWC14B ■	15		33				
6.425–7.11	TWC14C ■	18		36.5				

EEV Pulsed Travelling Wave Tubes - C-Band

Frequency range (GHz)	Type	Peak output power (W)	Duty cycle	Gain (dB)	Collector		R.F. connectors	Focus system
					Voltage (kV)	Current (mA)		
4.4–5.8	N10007 §	140	0.1♣	40	3.3	200	SMA	Integral★
4.4–5.8	N1094 §	250	0.05♣	40	3.4	370	SMA	Integral★

EEV Dual Mode Travelling Wave Tube - X-Band

Frequency range (GHz)	Type	Peak output power (W)	Duty cycle	Gain (dB)	Collector		R.F. connectors	Focus system
					Voltage (kV)	Current (mA)		
→ 9.0–10.5	N10011 §	820 210	0.5 1.0	49 29	5.5 5.5	740 330	SMA input WG16 output	Integral★

▲ Convection cooled periodic permanent magnet.

† High efficiency design to minimize power consumption.

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

☆ Convection cooled version available.

★ Conduction cooled periodic permanent magnet.

¶ Gain at 3 dB below saturation output power level.

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

** High efficiency dual collector tube.

■ Made to special order only.

§ Rugged.

⊕ Solenoid.

♣ High μ grid modulated.

‡ Any octave in the range.

→ New type.

EEV Travelling Wave Tubes - X-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)		
7.1–8.4	N10022	12	25	47	1.3	40	SMA	Integral†★ ←
7.0–8.5	N1071	16	24	44	2.0	45	Waveguide	N4134★☆☆
10.7–11.7	N10012**	12	25	40	1.5/0.6**	14/16**	SMA	Integral★
10.7–13.25	N1095	16	25	40	1.7	40	Waveguide	Integral★☆☆

M-OV Travelling Wave Tubes - X-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)		
7.0–11.5	TWX8	1.0	30	35¶	2.7	8.0	Waveguide	PPM▲
7.0–11.5	TWX22	1.0	30	35¶	2.6	8.0	Waveguide	PPM▲
7.0–11.5	TWX34	1.0	30	35¶	2.6	8.0	Waveguide	PPM▲
8.0–9.3	TWX16	5.0–20 kW (peak)	–	47–53	15–23	3–6 A (peak)	Waveguide	SMX16®

EEV Pulsed Travelling Wave Tubes, Coupled Cavity - X-Band

Frequency range (GHz)	Type	Bandwidth (MHz)	Peak output power (kW)	Duty cycle	Gain (dB)	Beam voltage (kV)	Beam current (A)	Focus system
X-Band	N10502§	500	50	0.015	42	31	7.5	Integral PPM
8.6–9.5	N10503§	900	28	0.01	50	25	6.0	Integral PPM
X-Band	N1061■	450	900	0.005	33	100	31	N4115®

EEV Broadband Travelling Wave Tube Amplifier Chains

Broadband power amplifier chain assemblies consisting of two cascaded travelling wave tubes and passive r.f. components necessary for required r.f. performance. The amplifier chains are ruggedly designed and packaged and are conduction cooled through the baseplate. They may be fitted with alternative coaxial r.f. connectors, control and modulation connections to meet specific customer requirements.

Frequency (GHz)‡	Type	Tubes	C.W. output power (W)	Drive power (µW)	Collector		R.F. connectors	Focus system
					Voltage (kV)	Current (mA)		
4.5–10	N10500	N1078 driver N1077 output	– 170	50 –	2.0 3.5	21 200	SMA input TNC output	Integral Integral ←
8.0–16.5	N10501	N1082 driver N1081 output	– 140	25 –	2.1 4.5	16 200	SMA input WG output	Integral Integral ←

Microwave Tubes

Duplexer Devices
Noise Generators
Pressure Windows
Monitor Diodes
Klystrons
Magnetrons
Travelling Wave Tubes
Backward Wave Oscillators

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.

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
4.5–10	N1078	1.5	37	2.0	2.0	25	SMA	0.9
4.5–10	N1077	100	27	5.8	3.2	210	TNC	3.6
6.5–10.5	N10016	25	40	4.8	2.0	70	SMA	1.5
7.0–11	N1080A	200	31	8.0	4.0	270	TNC	5.0
→ 8.0–12	N1089B▲	25	33	4.7	2.0	70	OSM215	2.0
10.5–12.4	N1065	35	36	4.83	2.0	64	OSM224	2.6
8.0–16.5	N1081	100	30	7.1	4.2	210	Waveguide	3.4
7.0–18	N1082	0.5	34	2.0	2.0	20	SMA	0.7
14–14.5	N10021	140	30	7.2	4.2	200	Waveguide	3.4

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	250	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

→ New type.

▲ Tube incorporates an equalizer.

† Alternative input connections available.

* Variation of typical output power over the band.

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Electro-optical Devices



Electro-optical Devices

- Leddicons
- Saticons
- Vidicons
- Ebsicons
- Image Intensifiers
- Image Isocons
- Image Orthicons
- Yokes and Cameras
- Shutter Tubes
- Storage Tubes
- Flash Tubes
- Character
Display Tubes
- Glow Modulators

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

EEV Television Camera Tubes - 2/3-inch 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.

See page 68 for Leddicon Conditioning Unit.

Type

Series	Suffix letters [□]	Description
→ P8160	B, G, R, M	Separate mesh, broadcast quality, designed for ENG, EFP and studio cameras.
→ P8161	B, G, R, M	Separate mesh, standard quality, for ENG, EFP and studio cameras.

EEV Television Camera Tubes - 1-inch Leddicons

See page 68 for Leddicon Conditioning Unit.

Type

Series	Suffix letters [□]	Description
P8021	B, G, L, R, M, X	Separate mesh. Front loading.
P8022	B, G, L, R, M, X	Separate mesh, with variable light bias from light source in socket. Front loading.
P8023	RF	Similar to P8021 but with extended red response and infrared filter.
	AR	Similar to P8021 but with extended red response and no infrared filter.
P8024	RF	Similar to P8022 but with extended red response and infrared filter.
	AR	Similar to P8022 but with extended red response and no infrared filter.
P8025	B, G, L, R, M	Separate mesh, variable light bias from light source in socket, highlight overload protection (H.O.P.) facilities. Front loading.
P8026	RF	Similar to P8025 but with extended red response and infrared filter.
	AR	Similar to P8025 but with extended red response and no infrared filter.
P8141	B, G, L, R, M	Rear loading version of P8021 series; separate mesh tube, interchangeable with comparable vidicons.
P8142	B, G, L, R, M	Rear loading version of P8022 series. Separate mesh tube with variable light bias from light source in socket; interchangeable with 1-inch vidicons.
P8143	RF	Rear loading version of P8023RF; separate mesh tube with extended red response and infrared filter.
	AR	Rear loading version of P8023AR; separate mesh tube with extended red response and no infrared filter.
P8144	RF	Rear loading version of P8024RF. Separate mesh tube with variable light bias from light source in socket; extended red response and infrared filter.
	AR	Rear loading version of P8024AR. Separate mesh tube with variable light bias from light source in socket; extended red response and no infrared filter.
P8145	B, G, L, R, M	Rear loading version of P8025 series. Separate mesh tube with variable light bias from light source in socket, highlight overload protection (H.O.P.) facilities.
P8146	RF	Rear loading version of P8026RF. Separate mesh tube with variable light bias from light source in socket, highlight overload protection (H.O.P.) facilities; extended red response and infrared filter.
	AR	Rear loading version of P8026AR. Separate mesh tube with variable light bias from light source in socket, highlight overload protection (H.O.P.) facilities; extended red response and no infrared filter.

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

B Blue channel	L Luminance channel	R Red channel
G Green channel	M Monochrome	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.

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→ New type.

EEV Television Camera Tubes - 30mm Leddicons

See page 68 for Leddicon Conditioning Unit.

Type		
Series	Suffix letters□	Description
P8000	B, G, L, R, M, X	30 mm diameter, integral mesh.
	B IG, G IG, L IG, R IG, M IG	Industrial grades of the above tubes.
P8130	B, G, L, R, M, X	Coaxial construction, separate mesh. Fixed internal light bias.
	HG, HL, HR, HM	High resolution version of the P8130 series.
P8131	B, G, L, R, M	Coaxial construction, separate mesh. Variable internal light bias.
	HG, HL, HR, HM	High resolution version of the P8131 series.
P8132	RF	Similar to P8130 but with extended red response and infrared filter.
	AR	Similar to P8130 but with extended red response and no infrared filter.
P8133	RF	Similar to P8131 but with extended red response and infrared filter.
	AR	Similar to P8131 but with extended red response and no infrared filter.
P8135	B, G, L, R, M	Separate mesh, coaxial construction with variable internal light bias. Highlight overload protection (H.O.P.) facilities.
P8136	B, G, L, R, M	Separate mesh, coaxial construction with fixed internal light bias. Highlight overload protection (H.O.P.) facilities.
P8137	RF	Similar to P8135 but with extended red response and infrared filter.
	AR	Similar to P8135 but with extended red response and no infrared filter.
P8138	RF	Similar to P8136 but with extended red response and infrared filter.
	AR	Similar to P8136 but with extended red response and no infrared filter.
P8400	B, G, L, R, M	Coaxial construction, separate mesh. Variable internal light bias controlled by an integral potentiometer in the tube base. ←
	HG, HL, HR, HM	High resolution version of the P8400 series.
P8401	RF	Similar to P8400 but with extended red response and infrared filter. ←
	AR	Similar to P8400 but with extended red response and no infrared filter.

Electro-optical Devices

Leddicons
 Saticons
 Vidicons
 Ebsicons
 Image Intensifiers
 Image Isocons
 Image Orthicons
 Yokes and Cameras
 Shutter Tubes
 Storage Tubes
 Flash Tubes
 Character
 Display Tubes
 Glow Modulators

Television Camera Tubes - Saticons®

EEV has recently been appointed distributor by Hitachi Electronic Components (UK) Ltd. for marketing SATICON Television Camera Tubes in the UK, Austria, Belgium, Denmark, Eire, France, Finland, Iceland, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Spain and Switzerland.

Type	Description	Features
H8362A	1-inch tube for high quality telecine cameras.	Low lag and high resolution. ←
H8397A	$\frac{2}{3}$ -inch tube for small size, high quality broadcast colour cameras.	Very low lag and high resolution. ←
H8398	$\frac{2}{3}$ -inch tube for small size, high quality broadcast colour cameras.	Very low lag. Fitted with faceplate stud. ←
H9311A	$\frac{2}{3}$ -inch tube for industrial or CCTV high quality colour cameras.	Very low lag. ←
H9313	$\frac{2}{3}$ -inch tube for very small industrial colour cameras.	Electrostatic focus. Very low lag; high resolution; small size. ←
H9324	$\frac{2}{3}$ -inch tube for high performance colour cameras.	Low lag; high resolution. ←
H9326	1-inch tube for studio cameras.	Low lag; fitted with faceplate stud. ←
H9336	$\frac{2}{3}$ -inch tube for small size ENG type cameras.	Small size and low lag. Version of H8397A with reduced length. ←
H9362	$\frac{2}{3}$ -inch tube for TV viewing of X-ray screens.	Low lag; high resolution. ←

The heater ratings of the above SATICONS are 6.3 V, 95 mA. Type H9313 has electrostatic focus, magnetic deflection; all other types have magnetic focus and deflection.

© Registered NHK Trademark.

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

Type	Application	Characteristics	Blemish standard	Heater current at 6.3 V (mA)	Photo-surface (see page 64)
P831	Military and industrial involving shock and vibration.	Short tube, robust construction; electrical characteristics similar to 8541A.	†	95	ii
P863‡	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.	†	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
→ P8123	Military and industrial involving shock and vibration.	Similar to P831 but with silicon diode array target.	†	95	—
P8201	Military and industrial involving shock and vibration.	Very short (4 inches — 102 mm) with compact integral focus and deflection coils. Robust construction.	†	95	ii
→ P8202	Military and industrial involving shock and vibration.	Similar to P8201 but with silicon diode array target.	†	95	ii



Vidicons 8507A, P863, P8201

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

A combined focus and deflection yoke MA517A for the range of standard 1-inch vidicons is available.

Type	Derivative	Application	Characteristics	Blemish standard	Heater current at 6.3 V (mA)	Photo-surface (see page 64)
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 900 nm. Short lag.	1st Grade	600	ii
	8507 (P848)	Industrial and educational.	High sensitivity and short lag, relaxed blemish specification.	Commercial	600	ii
	P841X	Medical use in conjunction with X-ray sensitive image intensifier.	Photosurface developed to match intensifiers with P20 phosphor output.	†	600	ii or v

EEV Television Camera Tubes - 1-inch Vidicons

Separate Mesh, Magnetic Focus and Deflection continued

A combined focus and deflection yoke MA517A for the range of standard 1-inch vidicons is available.

Type	Derivative	Application	Characteristics	Blemish standard	Heater current at 6.3 V (mA)	Photo-surface (see page 64)
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 900 nm. Short lag.	1st Grade	95	ii
	P849◇	Industrial and educational.	High sensitivity and short lag. Relaxed blemish specification.	Commercial	95	ii
	P849D◇ (8541)	Industrial and surveillance.	P849 with relaxed specification.	Industrial	95	ii
	P842X	Medical use in conjunction with X-ray sensitive image intensifier.	Photosurface developed to match intensifiers with P20 phosphor output.	†	95	ii or 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	ii
8626 (P847)		Monochrome broadcast, studio and educational.	Low power heater version of 8625 (P846).	1st Grade	95	iii
P8030		Colour or monochrome telecine, caption scanning; educational.	Version of 8541A with 300 mA heater.	†	300	ii
P8031		Industrial and educational.	High sensitivity and short lag. For use in cameras requiring 300 mA 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 and similar cameras.	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 and similar cameras.	High sensitivity and short lag. Signal output and resolution uniform over whole raster.	1st Grade	95	iii
P8203		Ultra high resolution medical, educational and industrial systems.	Limiting resolution in the region of 1600 TV lines.	1st Grade	95	ii ←
	P8204	Ultra high resolution medical, educational and industrial systems.	P8203 with relaxed blemish specification.	Commercial	95	ii ←
	P8205	Ultra high resolution medical, educational and industrial systems.	P8204 with relaxed blemish specification.	Industrial	95	ii ←

◇ P849/P849D can be supplied with special connector to permit operation in integral mesh cameras (i.e. as P862/P864 replacement).

† Specific tube grades and electrical parameters can be negotiated.

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

→ New type.

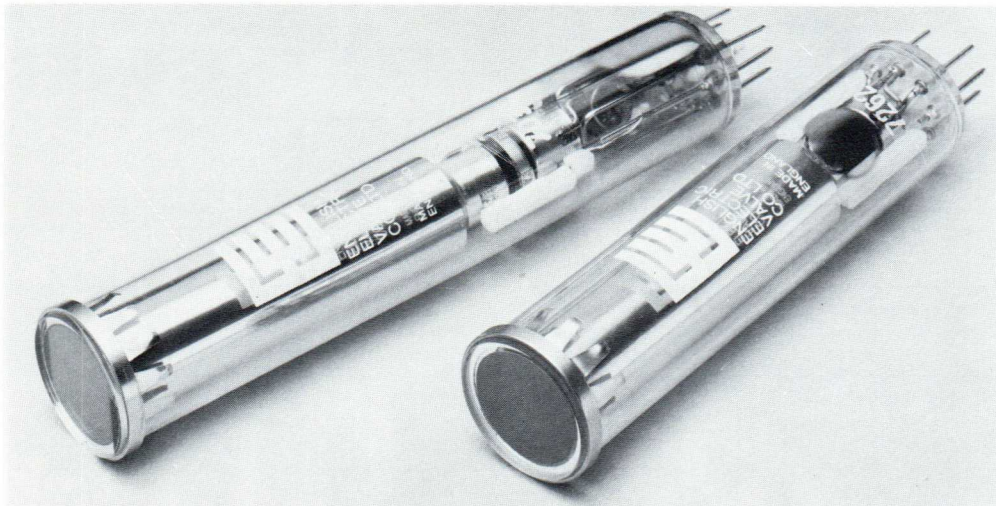
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Image Orthicons
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Storage Tubes
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Glow Modulators

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

A combined focus and deflection yoke MA517A for the range of standard 1-inch vidicons is available.

Type	Derivative	Application	Characteristics	Blemish standard	Heater current at 6.3 V (mA)	Photo-surface (see page 64)
7735B		High quality broadcast, educational, teletext 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
7038		Colour or monochrome teletext 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



Vidicons 7038 and 7262A

EEV Television Camera Tubes - 1-inch Vidicons Electrostatic Focus and Magnetic Deflection

Type	Application	Features	Blemish standard	Heater current at 6.3 V (mA)	Photo-surface (see page 64)
8134	Broadcast and industrial, compact monochrome.	7735B colour response and blemish specification.	†	95	ii
8134V1/4811	Broadcast, colour, teletext. 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.	1st Grade	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 Tube - $\frac{2}{3}$ -inch Vidicon Separate Mesh, Magnetic Focus and Deflection

A combined focus and deflection yoke MA584A for use with P8037 is available.

Type	Application	Features	Blemish standard	Heater current at 6.3 V (mA)	Photo-surface (see page 64)
P8037■	Compact colour and monochrome cameras for industrial, educational and surveillance applications.	High sensitivity and short lag. Compact construction.	Premium†	95	ii ←

EEV Television Camera Tubes - $1\frac{1}{2}$ -inch Vidicons Electrostatic Focus and Magnetic Deflection

Type	Application	Features	Blemish standard	Heater current at 6.3 V (mA)	Photo-surface (see page 64)
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

EEV Television Camera Tube - $1\frac{1}{2}$ -inch Vidicon Separate Mesh, Magnetic Focus and Deflection

Type	Application	Features	Blemish standard	Heater current at 6.3 V (mA)	Photo-surface (see page 64)
8521■	High resolution applications.	Limiting resolution in the region of 2000 TV lines. Very short lag.	1st Grade	600	ii

EEV Television Camera Tubes - Pyroelectric Vidicons

Details of a suitable camera and combined focus and deflection yoke are given on page 68.

Type	Application	Features
P8092	Thermal 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.
P8093	Thermal imaging	Hard vacuum pyroelectric vidicon with performance similar to P8092. ←

■ Made to special order only.

† Specific tube grades and electrical parameters can be negotiated.

→ New type.

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EEV Television Camera Tubes - Silicon Vidicons

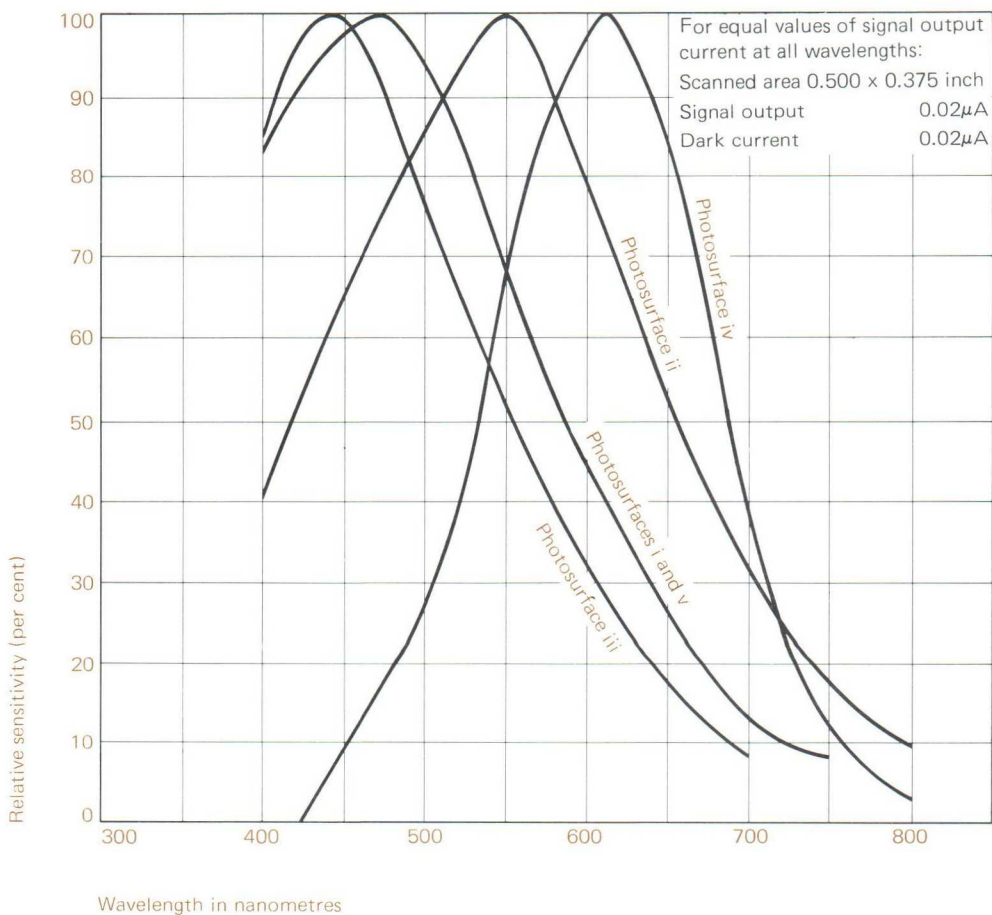
1-inch diameter tubes with silicon diode array target.

Type	Application	Features
→ P8122	Specialized closed-circuit industrial systems.	Similar to P8125 but with overall length reduced to 5.18 inches.
→ P8125	Specialized closed-circuit industrial systems.	Unaffected by extreme light overload and scan failure. No photoconductive lag. High sensitivity including near infrared. Low blooming.

See page 60 for details of Silicon Vidicons P8123 and P8202.

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 - Ebsicons

Compact, rugged tubes for low-light operation. Ebsicons use a silicon diode array target which is operated in the electron bombarded mode, giving high gain, low lag and good resistance to highlight overload damage. Photocathode voltage variation gives a wide range of gain control. A combined focus and deflection yoke MA561A is available.

Minimum useful illumination	Nominal image diagonal	Type	Application	Description
10^{-3} lux	16 mm	P8064	Television pick-up at very low light levels (moonlight conditions).	Basic tube with fibre-optic input, available with encapsulation and internal potential divider.
10^{-4} lux	16 mm	P8065	Television pick-up at very low light levels (starlight conditions).	Combination of P8064 and a single intensifier stage with fibre-optic input. Available with encapsulation and internal potential divider.

Note The above tubes are available in various grades and potting configurations.



Group of Ebsicons and Image Intensifiers

EEV Image Intensifiers

Compact, rugged tubes for night vision and other low light level applications. They use P20 output phosphor and S25 photocathodes.

Useful diameter (mm)		Type	Magnification (approx)	Luminance gain (apostilb/lux) (min)	Resolution at centre (line pairs/mm)	Distortion (%)	Net weight (g)
input	output						
18	7	P8302†	0.36	18 000**	70	7.5	300
18	18	P8301B†	1.0	40 000***	34	4	435
25	25	P8073	0.95	100*	50	7	150
25	25	P8076A‡	0.82 to 1.0	50 000***	30	19	900
25	25	P8076A/FP‡◆	0.82 to 1.0	50 000***	30	19	900
25	25	P8076DC‡▲	0.82 to 1.0	50 000***	30	6	900
25	25	P8076DC/FP‡◆▲	0.82 to 1.0	50 000***	30	6	900
40	40	P8097	1.0	100*	55	1	460

* Single stage, fibre-optic input and output.

** Two stages, fibre-optic input, plain glass output.

→ New type.

*** Three stages, fibre optic input and output.

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

† D.C. input voltage 2.65 V. Internal automatic brightness control.

▲ Distortion Compensation incorporated.

◆ Flash Protection incorporated.

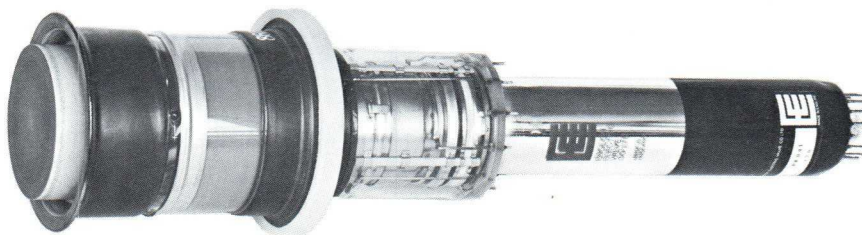
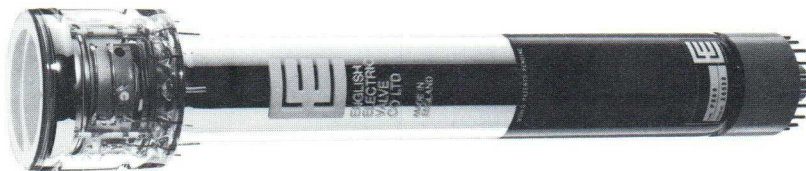
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EEV Television Camera Tubes – Image Isocons

Image Isocons are designed to provide optimum performance at low levels of scene illumination (moonlight conditions). Typical applications include – Night time detection and reconnaissance – Helicopter night landing and vehicle operations – Navigation – Deep sea low light inspection – Surveillance of borders, factory perimeters – Low intensity X-ray fluoroscopy. Details of a suitable camera and focus/deflection yoke for P8040 and P8041 are given on page 68.

Size	Nominal image diagonal	Type	Description
55 mm	40 mm	P8040	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 focus and deflection yoke MA355.
55 mm	40 mm	P8041	High sensitivity tube, identical with P8040 but with fibre-optic faceplate.
3-inch	40 mm	P880	High sensitivity tube, externally similar to image orthicon; most image orthicon cameras can readily be modified to accept it.
3-inch	40 mm	P887	Similar to P880 with fibre-optic faceplate for coupling to image intensifiers.



55 mm Image Isocon P8041 (top), 3-inch type P880 (centre) and Intensifier Image Isocon P8096 (bottom)

EEV Television Camera Tubes – Intensifier Image Isocons

Intensifier Image Isocons are designed to operate at very low levels of scene illumination (starlight conditions). The image isocon has a fibre optic input window and a photocathode spectral response matched to the image intensifier output illumination.

Isocon size	Nominal image diagonal	Type	Description
55 mm	40 mm	P8096 ■	Combination of 55 mm image isocon P8041 and a single stage intensifier with fibre-optic coupling. It operates with a scene illumination of 10^{-4} ft-candle.
55 mm	40 mm	P8310 ■	Combination of 55 mm image isocon P8041 and 40 mm, image motion compensated (I.M.C.) intensifier P8097.
3-inch	40 mm	P8095 ■	Combination of 3-inch image isocon P887 and a single stage intensifier with fibre-optic coupling. It operates with a scene illumination of 10^{-4} ft-candle.

■ Made to special order only.

Note Test camera P4177 can be supplied to special order, for test and evaluation of Image Isocon tubes. Details supplied on request.

EEV Television Camera Tubes – Image Orthicons

Note It is intended that Image Orthicons will be available to special order only from 1st January 1980 and will not be included in the next edition of this publication.

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. Anti-ghost image section.
3-inch	1.60 inch	P875	High quality studio and outdoor broadcast, monochrome or colour.	Similar to P874 but with lower target capacitance. Anti-ghost image section.
3-inch	1.60 inch	P882	High quality studio and outdoor broadcast.	Similar to P874, with bialkali photocathode giving increased sensitivity. Anti-ghost image section.
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.	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 7389C.
4½-inch	1.60 inch	P811G	Educational television service.	Similar to 7295C.
4½-inch	1.60 inch	P822G	Educational television service.	Similar to 7389C.
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.	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.

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.



Image Orthicons P875 (top) and 7295C

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EEV Television Camera Tubes - Yokes and Cameras

Type	Description
MA355A	Combined focus and deflection yoke for use with 55 mm Image Isocons P8040 and P8041.
MA504A	Combined focus and deflection yoke for use with EEV Memicons such as EP751 (see page 69).
MA509A	Combined focus and deflection yoke for use with rugged 1-inch Vidicons such as P863 and with 1-inch Pyroelectric Vidicons such as P8092 and P8093.
MA517A	Combined focus and deflection yoke for use with the range of standard 1-inch Vidicons.
MA561A	Combined focus and deflection yoke for use with Silicon Intensifier Target tubes such as Ebsicon type P8064.
MA584A	Combined focus and deflection yoke for use with the $\frac{2}{3}$ -inch Vidicon P8037.
P4177	Camera designed for use with the 55 mm Image Isocons P8040 and P8041, and the Intensifier Image Isocon P8096. The equipment comprises a head unit and a mains driven power supply and systems control unit.
P4200	Camera designed to meet the operating requirements of the Pyroelectric Vidicon P8092. It comprises a camera unit and a separate mains driven power supply. The camera incorporates a shutter and the lens panel can be arranged to accept any required lens.

EEV Camera Tube Conditioning Unit

→ The EEV Conditioning Unit P4217 is a 6-socket unit designed to allow lead oxide camera tubes such as the Leddicon to be conditioned periodically without using expensive colour camera equipment. Operation for a few hours each month extends tube shelf life and is beneficial to operational life.

The standard unit has 6 sockets capable of accepting any version of 30 mm or 25 mm tubes. A compatible module for $\frac{2}{3}$ -inch tubes is available as a separate option.

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 standard output phosphor is P11 (blue); the tubes are available to special order with P20 phosphor.

Useful screen area (mm)	Output faceplate	Type	Structure	Equivalent background illumination (max) (lux)	Static resolution (min) (line pairs/mm)	Input faceplate	Photo-cathode▲	Operating voltage (kV)
65 x 40	Fibre-optic	P855B	Tetrode	2×10^{-5}	13	Glass	S20	16
65 x 40	Fibre-optic	P855C	Tetrode	5×10^{-6}	13	Glass	S20	16
65 x 40	Fibre-optic	P855D	Tetrode	2×10^{-5}	13	Silica	S20	16
65 x 40	Fibre-optic	P855F	Tetrode	◆	13	Glass	S1	16
70 x 40	Fibre-optic	P856B	Triode	10^{-4}	13	Glass	S20	18
70 x 40	Fibre-optic	P856C	Triode	5×10^{-6}	13	Glass	S20	18
70 x 40	Fibre-optic	P856D	Triode	10^{-4}	13	Silica	S20	18
75 x 40	Glass	P855A	Tetrode	2×10^{-5}	13	Glass	S20	16
75 x 40	Glass	P856A	Triode	10^{-4}	13	Glass	S20	18
75 x 40	Glass	P855E	Tetrode	◆	13	Glass	S1	16

★ Suitable camera is available from John Hadland Ltd., Newhouse Laboratories, Bovingdon, Herts.

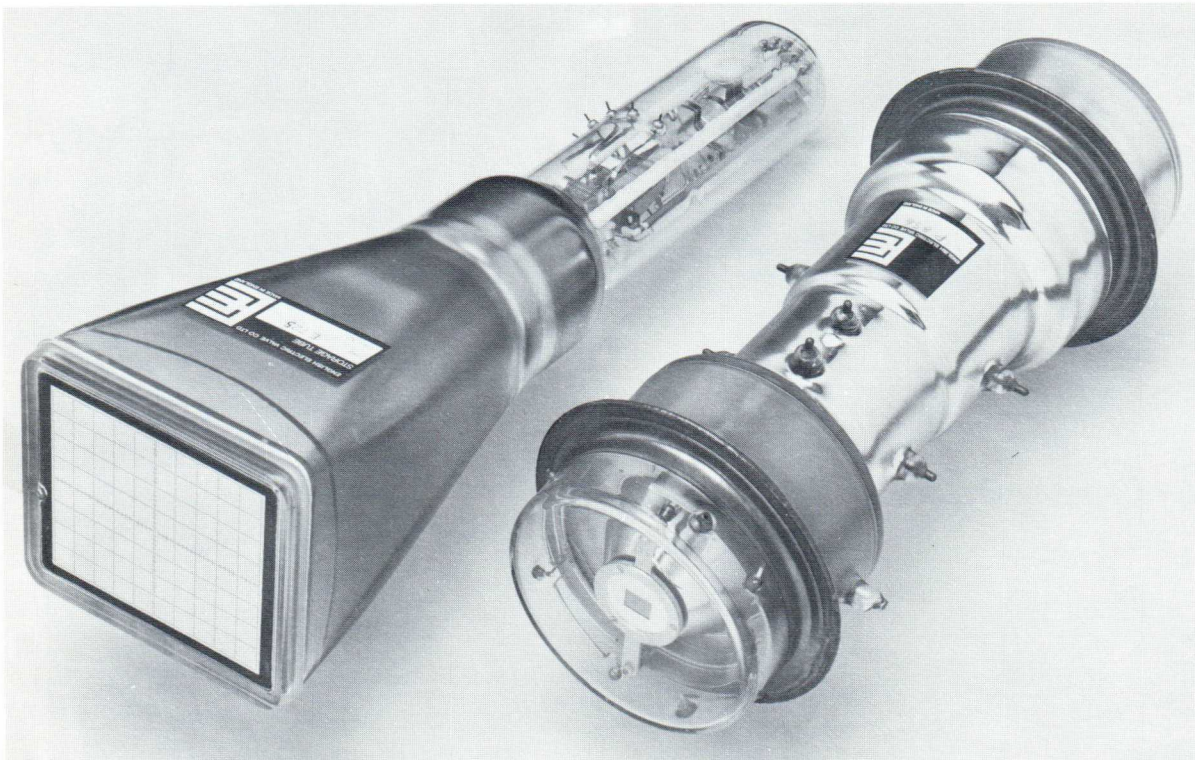
→ New type.

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

◆ Equivalent background noise $2 \times 10^{-1} \text{ }^2 \text{ A/cm}^2 \text{ max.}$

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 (10.2 cm) dia.	E702E	Direct view storage tube recommended for radar, medical and picture storage applications.	900	Electrostatic
4.0 inches (10.2 cm) dia.	E713B (CV9422)	Direct view storage tube recommended for radar applications under limited vibration conditions.	1800	Magnetic
10 div. x 8 div. (9 cm x 7.2 cm) 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. (9 cm x 7.2 cm) 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. (9 cm x 7.2 cm) 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. (9 cm x 7.2 cm) 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 100 cm/ μ s with a storage time of several minutes.	160	Electrostatic



Storage Tube E725 and Shutter Tube P856

EEV Flash Tubes

EEV produces Linear Flash Tubes for medium and high energy loadings to meet customers' requirements. Enquiries are invited for tubes to suit particular applications.

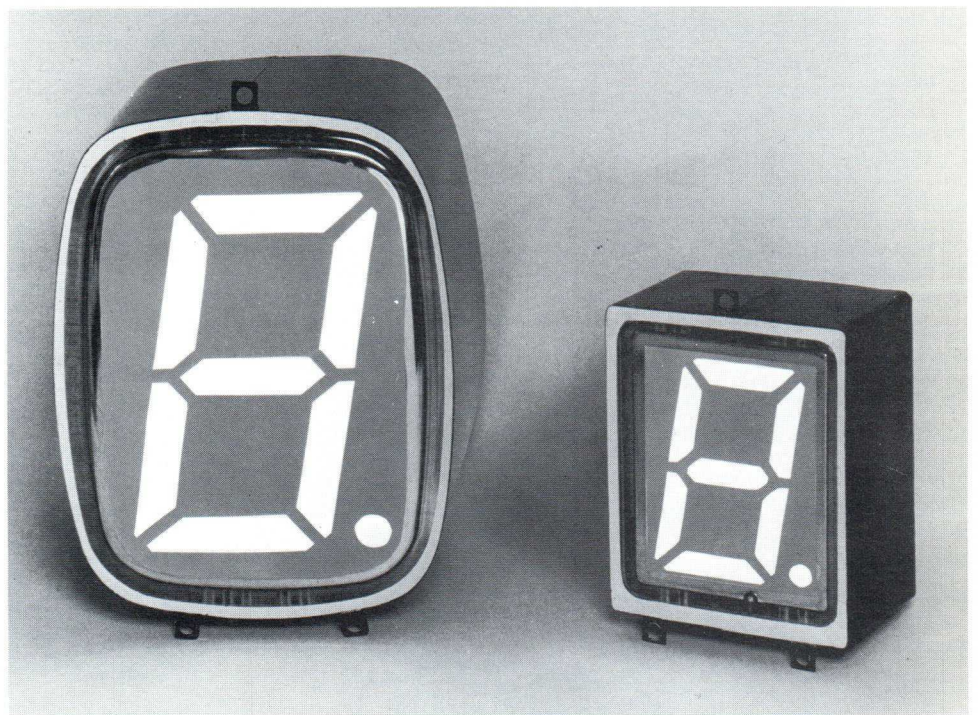
Electro-optical Devices

Leddicons
Saticons
Vidicons
Ebsicons
Image Intensifiers
Image Isocons
Image Orthicons
Yokes and Cameras
Shutter Tubes
Storage Tubes
Flash Tubes
Character
Display Tubes
Glow Modulators

EEV Character Display Tubes

EEV has developed alpha-numeric character tubes with displays in white, red, blue, yellow or green; special characters can be supplied. The power supply is 12 V d.c., all necessary conversions being carried out within the tube package, and the display can be switched rapidly by low level logic.

Character size (mm)	Type	Type of display	Power consumption (W)	Typical luminance (cd/m ²)	Switching voltage (V)
→ 7 squares 17 x 17	E732	7 squares in line	1	34000 (green)	10
90 x 55	E727	7-segment	2	3400 (green)	5.0
→ 90 x 70	E729	7 x 5 matrix	2	4100 (green)	10
→ 90 x 70	E733	7 x 5 matrix, flat tube	2	10000 (green)	10
→ 90 x 70 double sided	E734	7 x 5 double sided matrix, flat tube	3	10000 (green)	10
145 x 80	E728	7-segment	3	2550 (green)	5.0
→ 145 x 80	E731	7 x 5 matrix	3	2550 (green)	10



Character Display Tubes E728 and E727

EEV Glow Modulators

Crater diameter (inch)	Type	Luminance min† (cd/m ²)	Luminous intensity min† (candela)	Peak cathode current max (mA)	Average cathode current range (mA)	Break-down voltage max (V)	Operating voltage max† (V)
0.028	XL601	8.52×10^5	0.27	45	0.25–30	225	150*
0.028	XL627 §	Rugged version of XL601 in metal envelope					
0.028	XL631	8.52×10^5	0.27	45	0.25–30	225	150*
0.028	XL635 §	‡	‡	40	0.5–40	270	180*
0.028	XL641	7.5×10^5	0.25	45	1.0–30	225	150
0.060	1B59	1.7×10^5	0.3	75	5.0–35	225	150
0.060	XL603	2.12×10^5	0.375	75	5.0–30	225	150

* At 20 mA d.c.

† At 30 mA d.c.

§ Rugged.

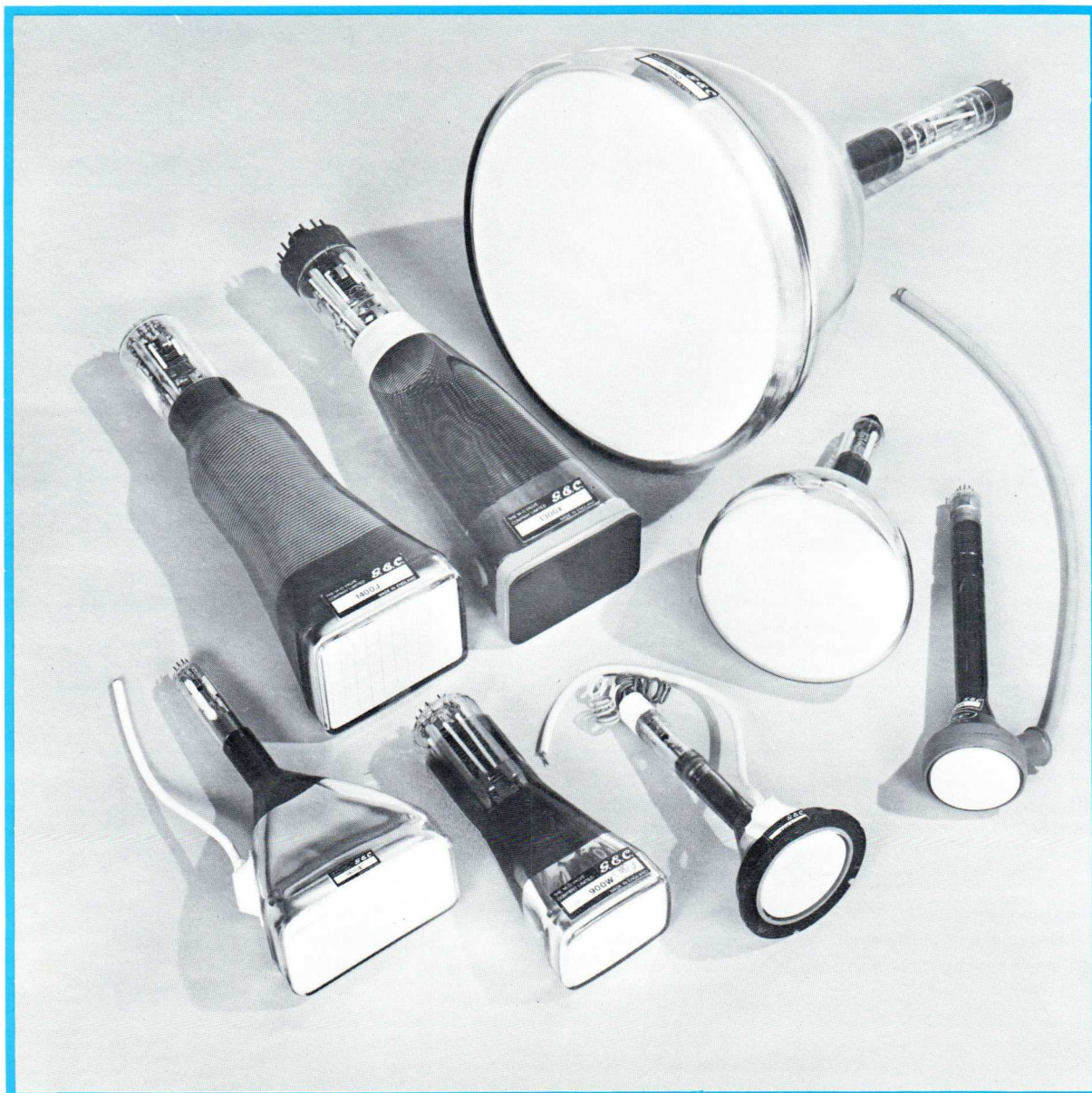
★ At 25 mA d.c.

‡ Red enhanced output.

→ New type.

Radar and Data Display	Page 72
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Cathode Ray Tubes



Cathode Ray Tubes

Radar and Data
Display
Avionic
Monitor
Instrument
Projection
Fibre-optic
Graticules
Phosphors

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 (CV5282)	308	53	12	-200 to 200	300	-70	B12A
11.5 x 6.5	1478E	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
16	F16-101LD	370	37	14	0 to 400	500	-46	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	F21-130GR F21-140GR★	328	60	14	0 to 400	400	-78	B8H
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 (CV429)(Tri)△	520	50	15	magnetic	-	-90	B12A
31	3069Q (CV9335)*■ 3073Q (CV5819) 3079Q 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 (CV429A) (Tet)■	520	50	15	magnetic	300	-90	B12A
→ 31	T957Y (CV5819) T957Y/TPD T957Z (CV9335) T957Z/TPD	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
32	3073S	467	55	10	-200 to +300	300	-77	B12A
→ 41	4169B■‡ 4177B■‡ 4196B■‡	612.5	50	18	± 200	300	-85	B12A
41	MF41-10△	518	70	12	magnetic	300	-70	B12A
41	T958Z/TPD	610	50	10	± 200	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.

■ Made to special order only.

★ Metal mounting frame bonded to bulb.

☆ Bezel has metric thread.

§ Bezel has imperial thread.

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

* Near equivalent.

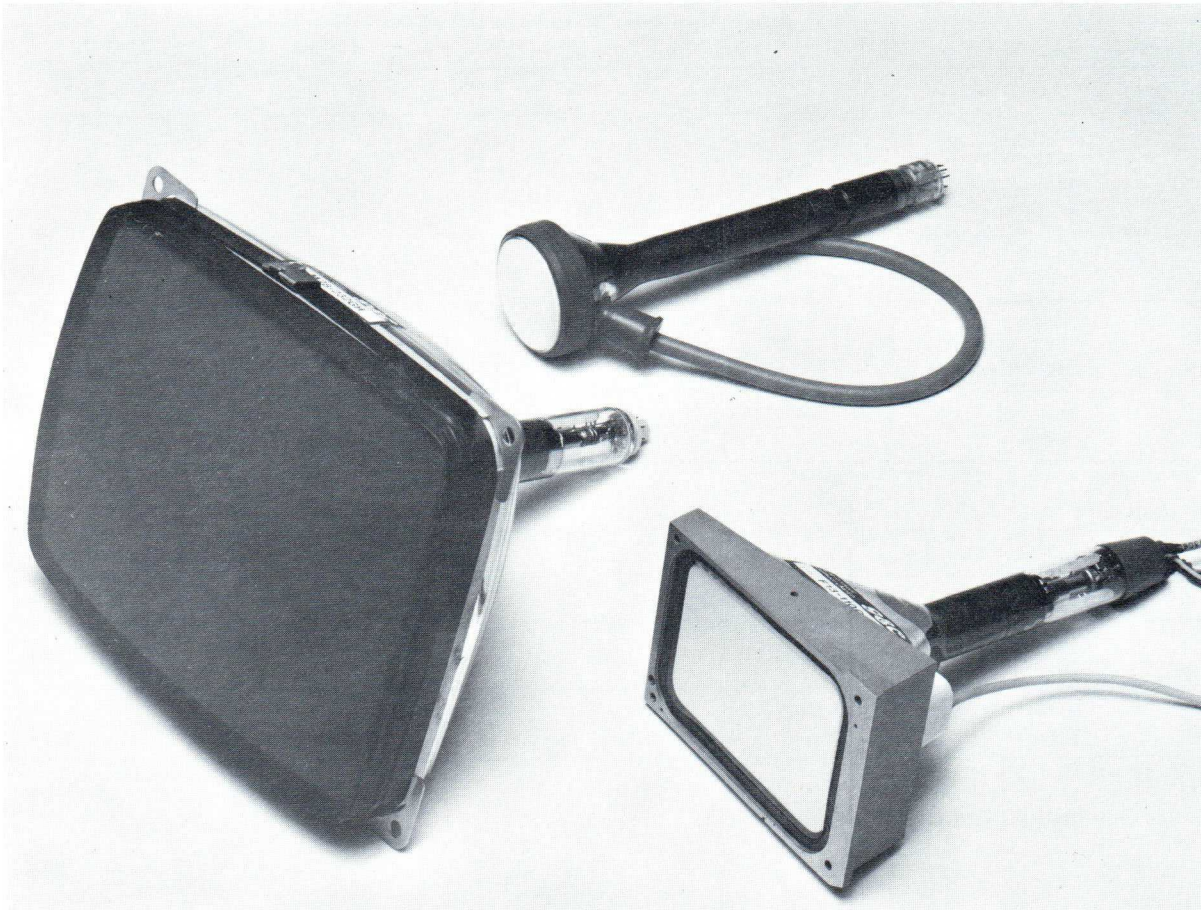
□ Without bonded faceplate.

‡ Direct replacement for 4100A but with higher hold-off voltage.

→ New type.

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	758H 769H (CV6217)	259	35	30	magnetic	-100	B9A ←
7	751J	195	45	15	magnetic	-50	Flying lead
11.5 x 6.5	1478E	268	44	17.5	-330 to 0	V _k 20	B9A/D
11.5 x 6.5	1478K (CV6229)	268	44	17.5	-330 to 0	V _k 20	B9A/D
11.5 x 8.5	F13-110GR	230	60	10	1000 to 1500	-70	Flying lead



Monitor CRT M28-232GH and Avionic Tubes 769H, F13-110GR

M-OV Monitor Cathode Ray Tubes (Electrostatic Focus and Magnetic 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
13.2 x 9.9	M17-190W	236	70	14	0 to 400	400	-62	B8H
13.2 x 9.9	M17-200BE	236	70	14	0 to 400	400	-80	B8H
14.2 x 10.9	AW17-20	345	44	12	± 200	300	-80	B12A
19.4 x 14.4	M24-140GJ	280	90	14	0 to 400	400	-80	Flying leads
22.8 x 17.1	M28-232GH M28-233GH □	276	90	14	0 to 400	400	-76	B8H
25.7 x 19.5	M32-100GJ	330	90	14	0 to 400	400	-80	Flying leads ←
29.1 x 22.6	M38-122GH	284.5	110	16	0 to 400	400	-85	B8H ←
29.1 x 22.6	M38-180GJ	368	90	14	0 to 400	400	-80	Flying leads ←

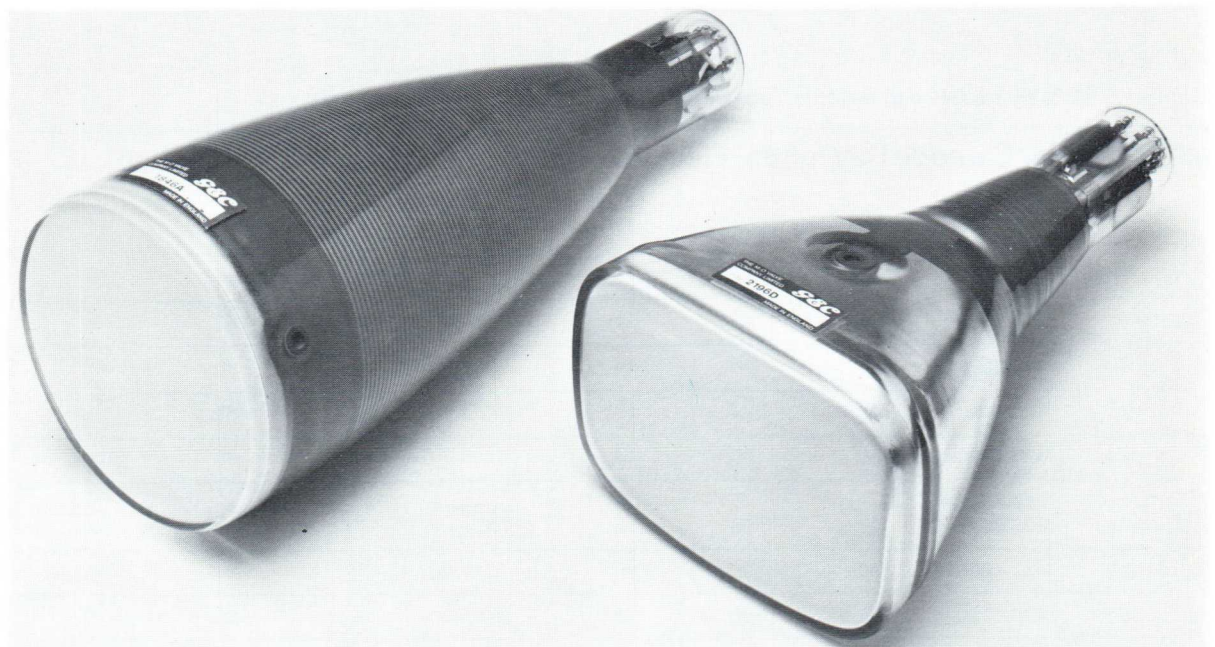
Cathode Ray Tubes

Radar and Data
Display
Avionic
Monitor
Instrument
Projection
Fibre-optic
Graticules
Phosphors

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		Base
						x (V/cm)	y (V/cm)	
→ 2.2	P03-100RA	100	0.9	–	–80	100	100	Flying leads
4	CV1522^Δ	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 x 5	D10-280GH	250	0.6	6.0	–84	13	4.2	B12F
7.8	CR144A (CV8632)	257	0.6	1.8	–40	22	13	Flying leads
10 x 6	1374Q[■]	335	0.9	9.0	–84	13.5	4.5	B12F
10 x 6	D13-47GH	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	1374R (CV9510)[■]	528	1.5	15	–85	12.3	3.2	B12F
15.4 x 20	2196D/G12	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

Single Gun Instrument CRT 1846A and 2196D



■ Made to special order only.
→ New type.

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

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		Base
						x (V/cm)	y (V/cm)	
10	1074H ^Δ	386	1.2	4.5	-72	21	8.0	B12F
13	1324A/2 [■]	432	1.5	3.0	-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

A group of Single and Double Gun Instrument CRT



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
7.6	P08-100BE P08-100GJ P08-100RA P08-100W	Flat	340 ± 5	25	35	-130	B12A
13	1351U 1358U 1368U 1384U	131 ± 1.5	364 ± 10	47	50	-170	B12A
14	T940B (CV10704) T940G (CV10705) T940R (CV10703) T940W	210	434	47	50	-170	B12A
13 x 7.8	P15-100BE P15-100GJ P15-100RA P15-100W	Flat	340 ± 5	50	35	-130	B12A

Cathode Ray Tubes

- ← Radar and Data
- ← Display
- ← Avionic
- ← Monitor
- ← Instrument
- ← Projection
- ← Fibre-optic
- ← Graticules
- ← Phosphors

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		Base	Class (see foot-notes)
						x (V/cm)	y (V/cm)		
→ 5.5	R06-100GR	300	0.66	15	-70	-	-	Flying leads	MM
6.5 x 9.5	1358X	380	0.72	6.0	-90	29	16	B14A	EE
10 x 0.5	R13-660BE	350	0.66	8.0	-110	30	40	B12F	EE
10 x 8	1458L	384	0.66	8.0	-110	25	31	B12F	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
20.3 x 3.2	R22-110BH	615	0.66	10	-60	-	-	B12A	EM
20.5 x 0.5	R23-120BE	450	0.66	10	-150	-	-	B12A	EM

Fibre-optic CRT (left to right) 1774A, R23-120BE, R13-660BE



CLASS

(First letter denotes focus, second letter denotes deflection)

E Electrostatic

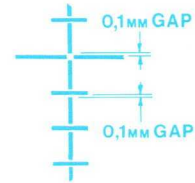
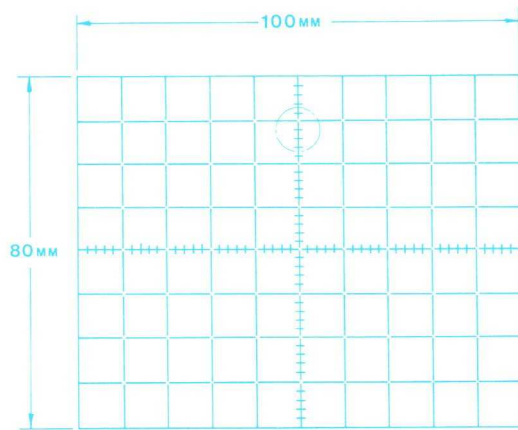
M Magnetic

→ New type.

M-OV Instrument Tube Graticules

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

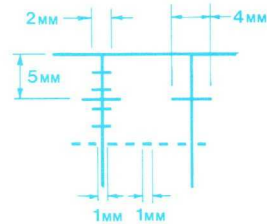
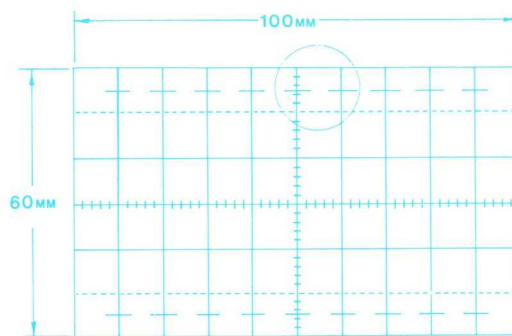
Graticule G1 – Black



WIDTH OF ALL LINES 0.3mm

ENLARGED DETAIL OF PART MARKED

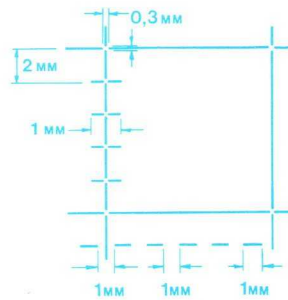
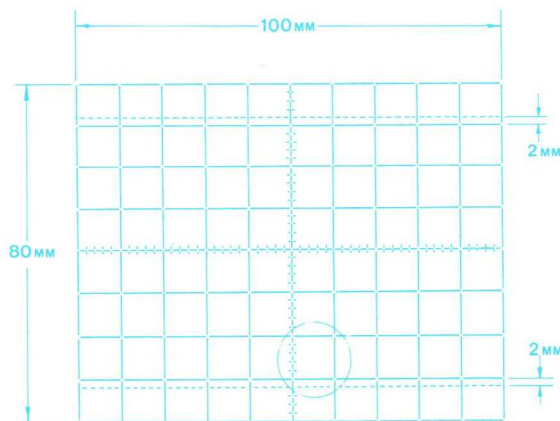
Graticule G3 – White



WIDTH OF ALL LINES 0.4mm

ENLARGED DETAIL OF PART MARKED

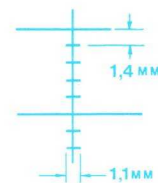
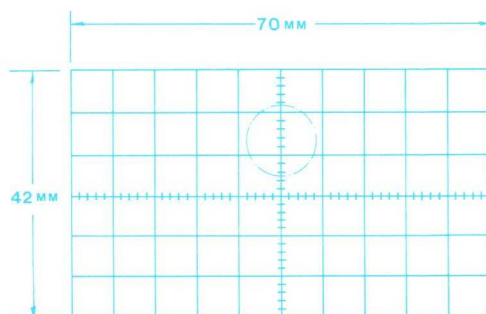
Graticules G4 – Black
G5 – White



WIDTH OF ALL LINES 0.2mm

ENLARGED DETAIL OF PART MARKED

Graticules G6 – Black
G7 – White



WIDTH OF ALL LINES 0.2mm

ENLARGED DETAIL OF PART MARKED

Cathode Ray Tubes

Radar and Data
Display
Avionic
Monitor
Instrument
Projection
Fibre-optic
Graticules
Phosphors

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
34	—	P22R	—	—	—	Red	Red	Medium-short	Projection
36	—	P47	BH	—	—	Blue	Blue	Very short	Photographic recording
46	X	P7	GM	M	P	White	Yellowish-green	Med. short/long*	Radar and slow speed oscilloscopes
+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.

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Special Products



Special Products

- Barretters
- Surge Arresters
- Dry Reed Capsules
- Geiger Müller Tubes
- EBW Devices
- Triggered Gaps
- Spark Gaps
- Ozotrons
- Gas Detectors
- Nernst Filaments

M-OV Barretter

Twin filament resistance lamp 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)
86	RL16 (P.O. No. 16)	250	120	250

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
Tropicalised 2-electrode moulded air gap	H13B■	600–900	—	Black
2-electrode moulded air gap	13D■	1100–1700	—	Blue
2-electrode moulded air gap	13E■	1050–1350	—	Blue
2-electrode button arrester with sliders to replace type 13	5A	240–360	—	—
2-electrode button arrester with wire ends	11A	195.5–264.5	—	—
Standard 3-electrode metal-ceramic envelope	16A	200–350	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
Wire ended version of Type 16	17			
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■	200–350	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	200–350	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			
Long wire ended (25 cm) version of Type 21A	23			
Sub-miniature 3-electrode metal-ceramic envelope, BPO Type 14A	49A	190–280*	160–215	—
→ Sub-miniature 3-electrode metal-ceramic envelope	49B	300–500	160–215	—
→ Encapsulated waterproof version of Type 49A	50A	190–350	160–220	—

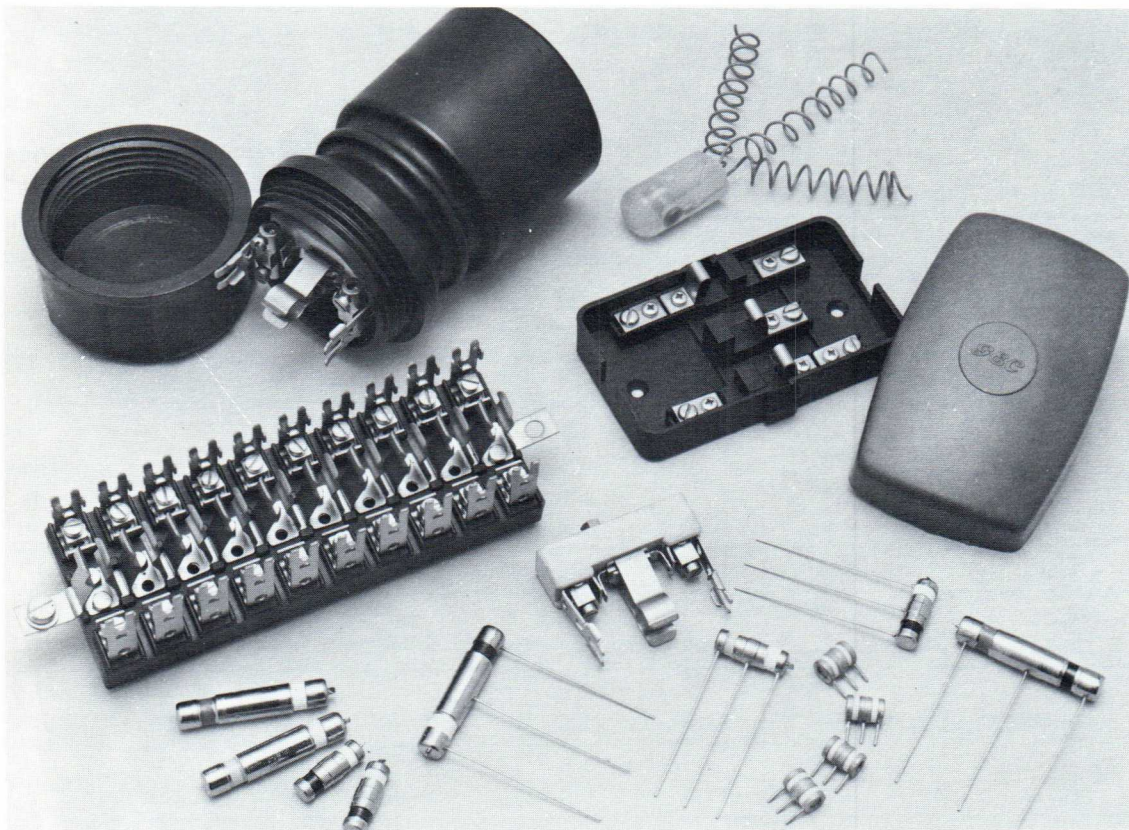
→ New type.

* Line to body only (line to line 190–320 V).

■ Made to special order only.

M-OV Arrester Mounts

Type	Description
53	A unit for surge arrester type 16 incorporating two gaps. The base provides high insulation resistance and dimensional stability in humid conditions.
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 arrester mounts.
56B	Similar to 56A but with accommodation for 20 type 53 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.
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.
67	A block of 10 mounts similar to type 53 but without spark gap.
68-40-23 (BPO Protector Board 1A)	A multiple arrester mounting board complete with type 23 arresters designed to fit the BPO fuse mounting type 8064 40-way terminal block.
68-50-23 (BPO Protector Board 2A)	A multiple arrester mounting board complete with type 23 arresters designed to fit the BPO fuse mounting type 10064 50-way terminal block.
69	A modified type 35A P.O. subscriber terminal box for arrester type 16 and 2 type 34 fuses. It is supplied with cover, has side entry ports and is primarily designed for instrument protection.



A group of Arresters and Mounts

M-OV Fuses

Standard porcelain body fuse with knife type contacts for use in mount types 55 and 69. Available as type 34A 2.5 ampere, 34B 0.5 ampere, 34C 1.0 ampere and 34D 1.5 ampere.

Type 34 dummy fuses are available.

A complete range of drop wire boxes, cross-connection units, MDF protection units and distribution cabinets is available. Details can be supplied on request.

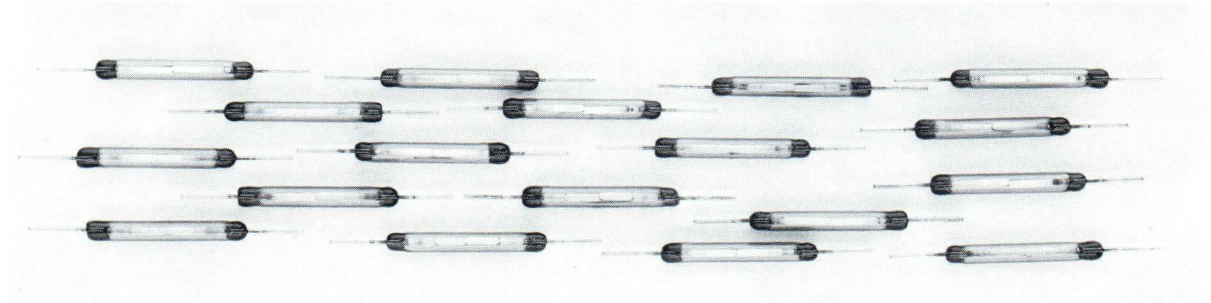
Special Products

Barretters
Surge Arresters
Dry Reed Capsules
Geiger Müller Tubes
EBW Devices
Triggered Gaps
Spark Gaps
Ozotrons
Gas Detectors
Nernst Filaments

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)
58	RC1	5.0	75	100	150	2.0	46.1	4
100	RCY	5.0	75	100	150	—	48	4



Dry Reed Capsules

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 back-ground counts/min.	Signal output (V)♦	Dead time (μs)	Recovery time (μs)
→ 1	G151	0.12	500–575	>10 ¹⁰	1–3	—	20	50
→ 100	G1070	0.12	400–460	>10 ⁹	3–5	—	20	50
200	GB6	0.05	1000–1200	6 × 10 ⁸	13	—	100	200
200	GB12	0.05	1000–1200	6 × 10 ⁸	26	—	100	200
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

→ New type.

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

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

■ Made to special order only.

M-OV Surge Protection Devices

Anode voltage (kV)	Type	Peak anode current (A)	Trigger voltage (V)	Anode/cathode breakdown time (μ s)	Total discharge per operation (coulombs)	Trigger duration (μ s)
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 $3 \text{ kV}/\mu\text{s}$ but does not fire if the rate of rise of anode voltage is less than $30 \text{ kV}/\text{ms}$.

EEV EBW Devices

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



Triggered Vacuum Gap

EEV Triggered Vacuum Gap

Type	Number of electrodes	Range of breakdown voltage (kV)	Cumulative charge rating (coulombs)	Connections/mounting
TVG1	3	0.5–20	40	CT1 cap and flexible lead

M-OV Triggered Spark Gap (for EBW Applications)

Anode-cathode hold-off voltage max (kV)	Type	Trigger-cathode breakdown voltage (trigger pos.) (kV)	Delay time*		Peak current max (A)	Discharge energy max (Joule)
			at V_a 1.5 kV (μ s)	at V_a 2.5 kV (μ s)		
3	CCT10	4	10	5	2000	1

* Between start of trigger and start of load current.

Special Products

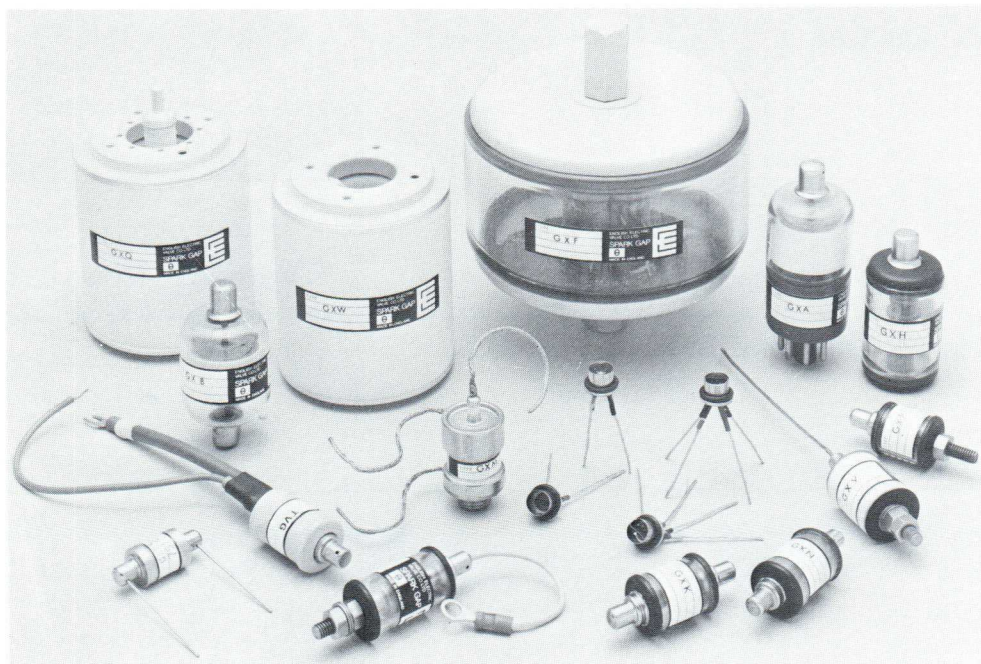
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EEV Spark Gaps

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 (coulombs)	Connections/mounting
GXA	2	5–16 (pulsed d.c. over a range 1000–1200 p.p.s.)	100	CT2 end cap and octal base
GXB	2	5–16 (pulsed d.c. over a range 1000–1200 p.p.s.)	100	CT2 end caps
GXC	2	0.5–30 (d.c.)	100	Flexible leads
GXE	2	0.5–3.0 (d.c.)	50	Flexible leads
GXF	2	0.25–15 (d.c.)	20000	Bolt on
GXH	2	0.5–6.0	600	6BA and 9.5 mm cap
GXK	2	0.4–8.0 (d.c.)	50	CT1 end caps
GXL	3	0.4–12 (d.c.)	50	CT1 end caps
GXM5A	2	0.5–3.0	30	Flexible leads
GXM70	3	3.0–7.0	50	Flexible leads
GXN	2	0.4–8.0 (d.c.)	400	CT1 end caps
GXP	2	0.4–8.0 (d.c.)	50	Stud and CT1 end caps
GXQ	3	0.4–65 (d.c.)	1000	Screw mounted
GXR	2	0.4–8.0 (d.c.)	400	Stud and CT1 end cap
GXS*	2	0.5–3.0	10	Stud mounted
GXV	2	0.4–8.0 (d.c.)	400	Stud mounted
GXW	2	0.4–20 (d.c.)	1000	Screw mounted
GXX	2	16–20 (d.c.)	75	Stud mounted

* For use under conditions of high dv/dt; typical impulse ratio 1.5 at 100 kV/ μ s.



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

EEV Trigatrons

Peak output power (kW)	Type	Pulse repetition rate max (p.p.s.)	Pulse duration max (μ s)	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 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 Combustible Gas Detector Elements

The 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)	Maximum bridge power consumption (W)
VQ1	20	up to 3	2	10	2.0 \pm 0.1	0.75
VQ2	15	up to 3	2	5	2.0 \pm 0.1	0.48
VQ3	20	up to 3	2	6	2.5 \pm 0.1	1.1
VQ4◇	20	up to 3	2	10	2.0 \pm 0.1	0.75
VQ6	A pair of inactive elements for use in detecting up to 100% concentration of gas.					
VQ9	15	up to 3	2	5	2.0 \pm 0.1 or 175 mA	0.48 ←
VQ10	15	3	2	5	2.0 \pm 0.1	0.48 ←

EEV Nernst Filaments - Infra Red Sources

Type	Operating current		Temperature range ($^{\circ}$ C)	A.C. supply voltage◆ (V)	Voltage drop ($V_{r.m.s.}$)
	minimum ($A_{r.m.s.}$)†	maximum ($A_{r.m.s.}$)‡			
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
NFT9	0.3	0.8	975–1700	200–250	60–80
NFT10	0.3	1.2	1125–1625	200–250	60–80
NFT11	0.3	1.4	1050–1550	200–250	50–60

† 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 2¼% concentration.

→ New type.

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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 Índice 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 figurì l'asterisco *; 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	Type to be replaced	EEV/M-OV replacement	Page no	Type to be replaced	EEV/M-OV replacement	Page no
0A2	0A2	21	3R/225E	BW1513J2	14	4KM100LA*	K376	42
0A2WA	0A2WA	21	3R/252E*	BW1102J2	14	4KM100LF*	K377	42
0G3	QS1209/5651	21		BW1182J2	14	4KM150LA*	K3276H	42
1B27	BS700	†	3R/265S1	BW1121J1	14	4KM50,000LA3*	K365	42
1B35A	BS412	35	3R/265S2	BW1121J2	14	4KM50,000LQ	4KM50,000LQ	43
1B58	BS58	31	3R/280E*	BW1515J2F	14	4KM50,000LR	4KM50,000LR	43
1B59	1B59	70	3V/340B	BT19	7	4MA7	M5057	51
1B63A	BS914	33	3V/390A	BT5B	7	4PR60B*	C1149/1	16
1G32P*	FX2535	8	3V/390B*	BT5B	7	4PR60C*	C1149/1	16
1G35P	FX2505	8	3V/490A*	BT17	7	4S016T*	C1108	16
1G45P	FX227	8	3V/500A	BT129	7	4S040T*	C1136	16
1K24	3B24W	5	3V/531E	BT141	7	4X150A	4CX250B	17
1M70A	RM101	44	3V5T*	BW1162	14	4X250B	4CX250B	17
2B2	2B2	82	3Z/340G	BY1144L	15	5A Arrester	5A Arrester	80
2B7	2B7	82	4-125*	C1108	16	5C21*	BT127	7
2B52*	C1134	16	4-125A*	C1108	16	5C22	8503	8
2B94*	C178A/5894	16	4-250*	C1112	16	5C22/HT415	8503	8
2G/402A	GXU1	6	4-250A*	C1112	16	5C22/PL522	8503	8
2G/472B	GXU2	6	4-250A/5D22*	C1112	16	5D22*	C1112	16
2G/473C	GXU3	6	4-400A*	C1136	16	5D22/4-250A*	C1112	16
2G22P	8503	8	4B/550E*	C1148	16	5F20RA	4CX250B	17
2G57	5557	7	4B/551B	C1148	16	5F22*	C1112	16
2H28	GXU1	6	4B/551E*	C1166	16	5F23A*	C1136	16
2H66	GU12	6	4B/602E	C1149/1	16	5H69*	BD510	6
2J30 to 2J34	2J30 to 2J34	†	4B/603E	C1150/1	16	5V3828	GXU1	6
2J42	2J42	48	4B32	GXU2	6	6CR4	A2521	20
2J42A	M513B	48	4C35	FX2505	8	6CT4	A2599	20
2J42H	2J42H	48	4C35/PL435	FX2505	8	6G21*	BT127	7
2J55	2J55	49	4C35A	FX2505	8	6G45	BT127	7
2J70A	2J70A	45	4CV75,000A	CY1170J	18	6G58	BT127	7
2J70B	M5063/2J70B	45	4CW10,000A	4CW10,000A	18	6H51*	BD510	6
2V/400A	GU12	6	4CW25,000A	4CW25,000A	18	6T40	B1152	12
2V/474C	AH238	6	4CX250B	4CX250B	17	6T50	B1153	12
2V/490C*	AH221	6	4CX1000A	4CX1000A	17	7ABP7A	7ABP7A	72
2V/500C	AH221	6	4CX1500B	4CX1500B	17	7ABP33A	7ABP33A	72
2XM600A	GU12	6	4CX5000A	4CX5000A	17	7C23	BR1165	13
3B21P*	C1150/1	16	4CX10,000D	4CX10,000D	17	7H57*	AH205/857B	6
3B24W	3B24W	5	4CX15,000A	4CX15,000A	17	7T25R*	BR1160	13
3B28	GXU1	6	4CX35,000C	4CX35,000C	17	8F10R	4CX5000A	17
3B29*	3B24W	5	4D21*	C1108	16	8F11R	4CX10,000D	17
3C/800E	B1153	12	4D32	4D32	16	8MA16	M5053	51
3C45	FX227	8	4F15R	4CX250B	17	8MA20	M5055	51
3C45/6130	FX227	8	4F21*	C1108	16	8MA23	M5054	51
3C45/PL345	FX227	8	4G48P*	CX1140	8	8MA26	M5059	51
3C45A	FX227	8	4H/135M	4CX250B	17	8NT5	BS386	39
3C45W*	FX227	8	4H/160M	4CX250B	17	8T39*	BY1122	15
3F10TA*	BW179	14	4H32	GXU2	6		BY1124	15
3F10TR*	BR179	13	4H72	BD520B	6	8T61*	BW189	14
3F15TR*	BR161	13	4H73*	AH2511	6	8T71R*	BR189	13
3F21P*	C1150/1	16	4H74	BD520C	6	9/03JB	2296P	†
3F60P*	C1149/1	16	4H88A*	GXU2	6	9/03LB	2273D	72
3G15*	AFX203	7	4HC/160M	4CX250B	17	9C25*	BR1102	13
3G49P	FX2519A/5949A	8	4J31	4J31	45	9M40	M513B	48
3G125T*	BY1144L	15	4J32	4J32	45	9M61	M5108	48
3J/167E*	BR1126	13	4J33	4J33	45	9M72	M5131	49
3J/187E*	BR1196	13	4J34	4J34	45	9M80	M5115	47
3J/192E*	BR1165	13	4J35	4J35	45	9RP33	2273D	72
3J/280E*	BR1183	13	4J43	4J43	45	9X64	BS196	33
3JC/187E*	BR1196	13	4J44	4J44	45	11A Arrester	11A Arrester	80
3K3000LQ	3K3000LQ	43	4J50	4J50A	50	11C1	A2293	20
3L2T*	BR1160	13	4J50A	4J50A	50	11D12	6080	20
3L5T*	BR1162	13	4J52A	4J52A	50	11E15	C1134	16
3R/167*	BW1195J3	14	4J53	4J53	45	11E16	C178A/5894	16

Type to be replaced	EEV/M-OV replacement	Page no	Type to be replaced	EEV/M-OV replacement	Page no	Type to be replaced	EEV/M-OV replacement	Page no
11TA31*	0A2	21	59-60/08/010	BS880	30	517	5557	7
12/03HB	3069Q	72	59-60/08/011	BS968	34	575A*	AH2511	6
12/03LB	3073Q	72	59-60/08/012	BS974	34		BD510	6
12/04HM	3069M	72	59-60/08/013	BS976	34	631*	BT5	7
12/44NM	MF31-55	72	59-60/08/014	BS912	30		BT5B	7
12E12*	C1150/1	16	59-60/08/024	BS960	35	632B*	BT5	7
12E13	KT88	20	59-60/08/027	BS102	32		BT5B	7
13B Arrester	13B Arrester	80	59-60/08/028	BS958	34	651	BK484/5552A	4
13D Arrester	13D Arrester	80	59-60/08/031	BS975	35	652	BK448/5551A	4
13E Arrester	13E Arrester	80	59-60/08/032	BS969	35	655	BK486/5553B	4
15D12	B1153	12	59-60/08/033	BS977	35	656	BK484/5552A	4
16A Arrester	16A Arrester	80	59-60/11/001	BS968	34	657	BK448/5551A	4
16B Arrester	16B Arrester	80	59-60/12/003	CX1157	9	658	BK486/5553B	4
16C Arrester	16C Arrester	80	59-60/12/005	CX1535	9	673*	AH2511	6
16E Arrester	16E Arrester	80	59-60/90/001	BS502	40		BD510	6
17	5557	7	59-60/90/006	BS716	30	676*	BT17	7
17 Arrester	17 Arrester	80	59-60/90/007	BM1038	50	678*	BT95	7
20PE13A	P8037	63	59-60/90/008	BM1039	50	681	BK66/5550	4
21A Arrester	21A Arrester	80	59-60/90/011	K3007	41	715	5557	7
21B Arrester	21B Arrester	80	59-60/90/013	BS510	40	715C*	C1150/1	16
21C Arrester	21C Arrester	80	59-60/90/024	BS104	31	724E	724E	74
21N13	BT5B	7	59-60/90/027	BS724 Series	30	751H	N10502	55
22 Arrester	22 Arrester	80	59-60/90/031	SC6 Series	22	751J	751J	73
22M1	1B59	70	59-60/90/053	BS710	30	769H	769H	73
23 Arrester	23 Arrester	80	59-60/90/062	YD1400	20	857B*	AH205/857B	6
24B1	24B1	85	60 Mount	60 Mount	81	758H	758H	73
24B9	24B9	85	61 Mount	61 Mount	81	866	GU12	6
26A Arrester	26A Arrester	80	63 Mount	63 Mount	81	866A	GU12	6
26B Arrester	26B Arrester	80	63QV26*	8541A	61	966	GU12	6
26C Arrester	26C Arrester	80	63QV26/P*	8541	61	967	5557	7
27 Arrester	27 Arrester	80	67 Mount	67 Mount	81	974W	974W	74
30MD1	BS502	40	68-40-23 Mount	68-40-23 Mount	81	996W	996W	74
31E12/T7	T957Z	72	68-50-23 Mount	68-50-23 Mount	81	1074H	1074H	75
31E12/T15	T957Y	72	69 Mount	69 Mount	81	1163	68506	6
31E13/T7	3069M	72	75B1	QS75/20	21	1255FIM*	7038	62
31F14/T7	T983Z	72	75C1	75C1	21	1255NOR*	7038	62
34 Fuses	34 Fuses	81	75PC11	P874	67	1257	BT5B	7
0041-15-300-0014	BS810	33	85A2	QS1209/5651	21	1290-99-618-9155	BS806B	36
43QV26*	8541A	61	90C1	QS1215	21	1295*	BT5	7
43QV26/P*	P849D	61	100MD1	BS510	40		BT5B	7
43QV26/R*	8541	61	100MD4	BS510	40	1324A/2	1324A/2	75
43QV26/T*	8541	61	150B2	QS1200	21	1324M	1324M	75
49A Arrester	49A Arrester	80	150B3	QS150/15	21	1324Y	1324Y	74
49B Arrester	49B Arrester	80	150C2	0A2	21	1324Z	1324Z	74
50A Arrester	50A Arrester	80	150C4	150C4	21	1325M	1325M	75
52QV26*	8541A	61	160A Arrester	160A Arrester	80	1346M	1346M	75
52QV26/R*	P842X	61	160B Arrester	160B Arrester	80	1346Y	1346Y	74
53 Mount	53 Mount	81	160C Arrester	160C Arrester	80	1346Z	1346Z	74
55 Mount	55 Mount	81	160E Arrester	160E Arrester	80	1351U	1351U	75
55B/200A	C1134	16	210-0069	5557	7	1358U	1358U	75
55B/400A	C178A/5894	16	238B	BK46/5555	4	1358X	1358X	76
55QU26	8541	61	249A/B	GU12	6	1368U	1368U	75
56A Mount	56A Mount	81	260A Arrester	260A Arrester	80	1374Q	1374Q	74
56B Mount	56B Mount	81	260B Arrester	260B Arrester	80	1374R	1374R	74
57	BT5B	7	260C Arrester	260C Arrester	80	1384U	1384U	75
57 Mount	57 Mount	81	272	5557	7	1424A	1424A	74
59-60/04/001	SC7 Series	22	287A*	5557	7	1424A/G1	1424A/G1	74
59-60/04/003	SC6 Series	22	308H	N10503	55	1424J	1424J	74
59-60/05/003	TWJ30	52	309	5557	7	1424J/G4	1424J/G4	74
59-60/06/013	M5124	51	357B	GU12	6	1430-99-533-4503	BS798	30
59-60/06/014	M5057	51	513QM8	P874	67	1430-99-624-0673	GXE30	84
59-60/08/001	BS834	30		P875	67	1446A/G1	1446A/G1	74
59-60/08/005	BS800	31	515QM8	7389C	67	1446J/G4	1446J/G4	74

* † Please refer to page 87.

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1458L	1458L	76	4415	P875	67	5840-99-638-5501	BS824	31
1468A	1468A	74	4478	P826/4478	62	5841-99-639-6787	BS122	34
1474B	1474B	74	4493	P893/4493	62	5841-99-643-9725	GXR18.5	84
1478E	1478E	72	4494	P894/4494	62	5841-99-649-9447	GXX160/2	84
1478K	1478K	73	4495	P895/4495	62	5842	5842	20
1496B	1496B	74	4532	P8125	64	5853	BS110	31
1578A	1578A	72	4536	P858	67	5867*	DET40	12
1578B	1578B	72	4543	8541A	61	5877	BT125	7
1754/5948	CX1140	8	4559A	8507A	60	5878	BT127	7
1774A	1774A	76	4588*	P8034A	61	5894*	C178A/5894	16
1774B	1774B	76	4589	P841F	†	5910-99-142-5816	UC1000A/20/150	26
1824A	1824A	74	4591 Series	P8000 Series	59	5910-99-142-5817	UC450A/30/150	26
1846A	1846A	74	4592 Series	P8130 Series	59	5910-99-519-0952	U500/10/40	24
1907	FX2519A/5949A	8		P8400 Series	59	5910-99-522-3862	UFC100/30/120J	28
2070-700-1248	FX2535	8	4593	P8132AR	59	5910-99-527-5989	MA52	24
2168A	2168A	72		P8401AR	59	5910-99-533-5103	MA501A	†
2174C	2174C	74	4594	P8132RF	59	5910-99-533-6992	UC2300/8/125JB	26
2196C	2196C	74	4804	P8064	65	5910-99-533-6993	UC750/20/150JA	26
2196D/G12	2196D/G12	74	4809	P8038	61	5910-99-539-2266	U80/15/40	24
2255*	8626	61	4810	8480V1/4810	63	5910-99-580-1051	U30/15/20	24
2255AMR*	P849D	61	4811	8134V1/4811	62	5910-99-580-1052	U50/15/30	24
2255BAE*	P849D	61	4816	P8130X	59	5910-99-580-1053	U80/15/40	24
2255ENT*	P849D	61	4817	P8130X	59	5910-99-630-8439	MA126	24
2255FIM*	P844	61	4849	P8065	65	5910-99-639-9976	UF6/15/7	27
2255IND	P8031	61	5221	GXU1	6	5910-99-924-3070	U90/15/40	24
2255IND*	8541	61	5528	BT127	7	5910-99-954-0794	UF10/15/7J	27
2255NOR*	8541A	61	5544	BT125	7	5910-99-954-0803	UF6/15/7	27
2255RF	P8031N	61	5545	BT127	7	5910-99-957-2089	U2000/8/75J	25
2255ROE*	P842X	61	5550	BK66/5550	4	5910-99-957-2090	U1000/10/75J	25
2255SF	P8031Z	61	5551	BK448/5551A	4	5920-99-112-1705	GXF5	84
2260AMR	P849D	61	5551A	BK448/5551A	4	5920-99-193-6431	61 Mount	81
2260BAE	P849D	61	5552	BK484/5552A	4	5920-99-193-9835	16B Arrester	80
2260ENT	P849D	61	5552A	BK484/5552A	4	5920-99-531-5167	16A Arrester	80
2260FIM	P844	61	5553	BK486/5553B	4	5920-99-537-6697	GXN25	84
2260IND	8541	61	5553B	BK486/5553B	4	5920-99-625-5240	GXB185	84
2260NOR	8541A	61	5554	BK504/5554	4	5920-99-639-9438	GXN20	84
2260ROE	P842X	61	5555	BK46/5555	4	5920-99-711-7317	16C Arrester	80
2269Y	2269Y	72	5557	5557	7	5920-99-901-6279	53 Mount	81
2273D	2273D	72	5559	BT5B	7	5920-99-956-0579	16A Arrester	80
2273P	2273D	72	5560/FG95*	BT5B	7	5923	BW1165	14
2700*	8134	62	5586	5586	46	5924	BR1165	13
2700IND*	8134V1/4811	62	5586A	M5083A	45	5935-99-105-7229	MA153	†
2705IND	8134V1/4811	62	5651*	QS1209/5651	21	5935-99-626-1261	MA91	†
2861B	4CX250B	17	5651WA	QS1212	21	5935-99-626-8121	MA94	†
3069M	3069M	72	5657	5657	46	5935-99-633-4202	MA275	†
3069Q	3069Q	72	5671*	BR189	13	5935-99-716-9761	MA357	†
3069R	3069R	72	5685*	BT127	7	5935-99-955-6870	MA179	†
3073Q	3073Q	72	5720*	BT5B	7	5948*	CX1140	8
3073S	3073S	72	5728*	BT5B	7	5948A*	CX1140	8
3077R	3077R	72	5762A*	BR1160	13	5949	FX2519A/5949A	8
3079Q	3079Q	72	5820 Series	P874	67	5949A	FX2519A/5949A	8
3079R	3079R	72		P875	67	5950-99-519-8458	SMX16	55
3096Q	3096Q	72	5820-99-636-1873	GXV6.5	84	5950-99-580-0584	SMS6	53
3096R	3096R	72	5820-99-639-9439	MA104A	†	5956*	FX2535	8
4017	GU12	6	5822	BK5822A	4	5957*	FX2535	8
4049D	AH221	6	5822A	BK5822A	4	5960-00-082-4125	7262A	62
4049GD	BT129	7	5830*	BT69	7	5960-00-100-7136	FX2505	8
4077A*	AH221	6	5840-99-521-3265	BS864	36	5960-00-107-7590	2J42	48
4078GA	BT141	7	5840-99-527-4682	BS660	38	5960-00-108-0252	GXU1	6
4169B	4169B	72	5840-99-527-4683	BS662	38	5960-00-108-0259	FX227	8
4177B	4177B	72	5840-99-533-5640	BS366	40	5960-00-114-4714	3B24W	5
4196B	4196B	72	5840-99-618-7987	MA311	†	5960-00-116-9924	3B24W	5
4261	5557	7	5840-99-626-3141	BS856	32	5960-00-116-9969	8503	8

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5960-00-166-7692	5586	46	5960-14-226-0204	5657	46	5960-99-000-1923	BS810	33
5960-00-166-7693	5657	46	5960-14-256-3668	2273D	72	5960-99-000-2012	QS1209/5651	21
5960-00-188-3534	BS914	33	5960-14-256-3774	P862	†	5960-99-000-2124	BK484/5552A	4
5960-00-188-3559	BS912	30	5960-14-256-8726	K3078/6975	41	5960-99-000-2130	C1108	16
5960-00-188-3564	0A2	21	5960-15-252-9810	2J42H	48	5960-99-000-2131	C1112	16
5960-00-188-8646	BT5	7	5960-17-024-3472	QS1215	21	5960-99-000-2138	GM4	82
5960-00-230-5272	4CX250B	17	5960-17-032-8318	M599B	47	5960-99-000-2139	EHM2S	82
5960-00-242-6051	2J55	49	5960-17-033-9201	4CX5000A	17	5960-99-000-2157	BS710	30
5960-00-243-5018	C1136	16	5960-17-035-0700	8541	61	5960-99-000-2160	A207	5
5960-00-247-8748	5842	20	5960-17-606-4243	CX1140	8	5960-99-000-2163	ACT28	13
5960-00-248-3077	8503	8	5960-21-847-3315	K3007	41	5960-99-000-2181	BS104	31
5960-00-248-3088	FX2519A/5949A	8	5960-21-853-1148	M542W	†	5960-99-000-2186	BM1031	49
5960-00-261-8680	0A2WA	21	5960-21-855-6948	CX1180	9	5960-99-000-2225	QS1200	21
5960-00-262-0180	6080	20	5960-21-855-9183	C1166	16	5960-99-000-2231	A2226	20
5960-00-262-0181	6080WA	20	5960-21-859-7072	CX1157	9	5960-99-000-2261	BM1038	50
5960-00-262-0227	4J53	45	5960-21-867-7222	3069R	72	5960-99-000-2262	BM1039	50
5960-00-262-0286	QS1212	21	5960-99-000-0005	AH221	6	5960-99-000-2274	BS114	35
5960-00-262-1355	FX227	8	5960-99-000-0187	U19	5	5960-99-000-2281	M537A	48
5960-00-262-1356	BS412	35	5960-99-000-0233	GXA50	84	5960-99-000-2284	4J50A	50
5960-00-296-5541	2J42H	48	5960-99-000-0235	U19	5	5960-99-000-2285	BS702	30
5960-00-390-5208	8503	8	5960-99-000-0273	DET22	21	5960-99-000-2306	BS156	33
5960-00-503-4880	0A2WA	21	5960-99-000-0284	QS75/20	21	5960-99-000-2307	BS158	33
5960-00-504-8548	4J31	45	5960-99-000-0287	QS150/15	21	5960-99-000-2308	BS116	35
5960-00-542-7181	FX2519A/5949A	8	5960-99-000-0294	BS710	30	5960-99-000-2309	BS118	35
5960-00-543-1001	6080WA	20	5960-99-000-0295	GXA85	84	5960-99-000-2311	BS200	33
5960-00-548-9851	8503	8	5960-99-000-0354	DET23	21	5960-99-000-2312	BS202	33
5960-00-552-8277	FX2505	8	5960-99-000-0372	FX227	8	5960-99-000-2313	BM1032	50
5960-00-577-3027	KT88	20	5960-99-000-0397	DET24	21	5960-99-000-2319	BM1006	46
5960-00-615-4376	4CX250B	17	5960-99-000-0402	GXA80	84	5960-99-000-2322	BR161	13
5960-00-615-5529	6080	20	5960-99-000-0403	24B9	85	5960-99-000-2323	BR179	13
5960-00-617-6367	0A2WA	21	5960-99-000-0427	C1150/1	16	5960-99-000-2343	K335	41
5960-00-617-8584	QS1212	21	5960-99-000-0429	3069M	72	5960-99-000-2359	BS156	33
5960-00-652-5944	N1073	53	5960-99-000-0436	ACT25	13	5960-99-000-2376	M521	49
5960-00-663-5968	4CX5000A	17	5960-99-000-0449	QS1209/5651	21	5960-99-000-2378	BS718	30
5960-00-669-6807	4J52A	50	5960-99-000-0460	BS48	35	5960-99-000-2379	BS720	30
5960-00-669-8515	BK66/5550	4	5960-99-000-0461	BS92	35	5960-99-000-2381	N1034A	56
5960-00-669-8676	C1134	16	5960-99-000-0462	BS84	35	5960-99-000-2393	N1010A	56
5960-00-681-9523	4CX250B	17	5960-99-000-0463	BS82	35	5960-99-000-2397	DET29	21
5960-00-686-8631	4D32	16	5960-99-000-0482	A237	5	5960-99-000-2399	GXU3	6
5960-00-752-5979	C1149/1	16	5960-99-000-0488	GXA95	84	5960-99-000-2412	M523	50
5960-00-754-9775	K3078/6975	41	5960-99-000-0513	4J53	45	5960-99-000-2416*	C1149/1	16
5960-00-755-0186	4CX250B	17	5960-99-000-0532	AH211A	6	5960-99-000-2424	M549	50
5960-00-778-2341	4CX1000A	17	5960-99-000-1075	KT66	20	5960-99-000-2425	M539	50
5960-00-800-0602	7038	62	5960-99-000-1128	GT1C	7	5960-99-000-2426	M529	50
5960-00-806-9629	4D32	16	5960-99-000-1144	BT19	7	5960-99-000-2430	BS716	30
5960-00-810-3603	4CX1000A	17	5960-99-000-1147	BT5	7	5960-99-000-2453	A2521	20
5960-00-834-4807	N1056	53	5960-99-000-1219	DA100	12	5960-99-000-2456	SC1/350	22
5960-00-892-0813	6080WA	20	5960-99-000-1435	AH221	6	5960-99-000-2457	SC1/400	22
5960-00-892-0814	QS1212	21	5960-99-000-1629	AH238	6	5960-99-000-2458	SC1/600	22
5960-00-892-0828	4CX250B	17	5960-99-000-1730	KT66	20	5960-99-000-2459	SC1/800	22
5960-00-905-9126	4CX15,000A	17	5960-99-000-1742	BK504/5554	4	5960-99-000-2460	SC1/1000	22
5960-00-936-7931	4CX1500B	17	5960-99-000-1743	GXA60	84	5960-99-000-2461	SC1/1200	22
5960-00-958-0083	7262A	62	5960-99-000-1787	FX2505	8	5960-99-000-2462	SC1/1400	22
5960-12-127-0721	QS1209/5651	21	5960-99-000-1832	0A2	21	5960-99-000-2463	2269Y	72
5960-14-200-1412	QS1209/5651	21	5960-99-000-1835	GXU1	6	5960-99-000-2473	M538A	50
5960-14-201-0321	6080WA	20	5960-99-000-1841	BS52	33	5960-99-000-2481	BS932	31
5960-14-205-0742	6587	8	5960-99-000-1859	GXA160	84	5960-99-000-2482	BS838	30
5960-14-206-3385	4J50A	50	5960-99-000-1866	2J42	48	5960-99-000-2488	BS724 Series	30
5960-14-206-3386	4J52A	50	5960-99-000-1881	BS384	39	5960-99-000-2494	K351	41
5960-14-220-4497	C1108	16	5960-99-000-1897	4J34	45	5960-99-000-2518	GXU2	6
5960-14-220-4515	5586	46	5960-99-000-1898	4J35	45	5960-99-000-2519	4CX250B	17
5960-14-220-4523	FX227	8	5960-99-000-1914	4J31	45	5960-99-000-2520	8503	8
5960-14-220-4526	C1112	16	5960-99-000-1916	4J33	45	5960-99-000-2673	AH205/857B	6

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5960-99-000-2744	4J34	45	5960-99-037-3159	DET22	21	5960-99-037-5171	K391	41
5960-99-000-2775	68506	6	5960-99-037-3162	DET22D	21	5960-99-037-5177	M577B	45
5960-99-000-2797	C178A/5894	16	5960-99-037-3164	C1136	16	5960-99-037-5289	ACM3	13
5960-99-000-2799	C1134	16	5960-99-037-3176	GXU6	6	5960-99-037-5295	BR1122	13
5960-99-000-2858	3B24W	5	5960-99-037-3195	K359	41	5960-99-037-5320	C1166	16
5960-99-000-2868	AFX203	7	5960-99-037-3200	BS204	31	5960-99-037-5321	8626	61
5960-99-000-2957	5557	7	5960-99-037-3201	BS286	31	5960-99-037-5332	SC2/3000	22
5960-99-000-2993	8503	8	5960-99-037-3202	M578B	45	5960-99-037-5426	N1034S	56
5960-99-000-3528	M513A	48	5960-99-037-3212	A292	5	5960-99-037-5439	BS818	35
5960-99-000-3540	8503	8	5960-99-037-3213	M570W	46	5960-99-037-5440	BS826	35
5960-99-000-3543	4D32	16	5960-99-037-3214	M569W	46	5960-99-037-5559	T940R	75
5960-99-000-3611	5586	46	5960-99-037-3215	M579	46	5960-99-037-5560	T940B	75
5960-99-000-3629*	FX227	8	5960-99-037-3238	DET23	21	5960-99-037-5561	T940G	75
5960-99-000-3676	2J42	48	5960-99-037-3263	A207	5	5960-99-037-5615	F21-10LD	72
5960-99-000-3789	5842	20	5960-99-037-3276	A2521	20	5960-99-037-5616	M599B	47
5960-99-000-3840	BS462	33	5960-99-037-3279	C1134	16	5960-99-037-5708	769H	73
5960-99-000-3926	BR1165	13	5960-99-037-3301	A2293	20	5960-99-037-5879	P863	60
5960-99-000-3958	5657	46	5960-99-037-3307	M566	46	5960-99-037-5940	M5035	46
5960-99-000-3982	M506A	49	5960-99-037-3308	M566	46	5960-99-037-6033	CX1157	9
5960-99-000-3997	M513B	48	5960-99-037-3309	M573	46	5960-99-037-6035	P863	60
5960-99-000-4020	0A2WA	21	5960-99-037-3335	C1134X	†	5960-99-037-6036	P896A	†
5960-99-000-4048	QS1212	21	5960-99-037-3370	0A2	21	5960-99-037-6044	SC6/5000	22
5960-99-000-4054	QS1213	21	5960-99-037-3377	0A2WA	21	5960-99-037-6045	SC6/7000	22
5960-99-000-4079	A2293	20	5960-99-037-3466	TT21	16	5960-99-037-6046	SC6/10000	22
5960-99-000-4080	75C1	21	5960-99-037-3472	3073Q	72	5960-99-037-6047	SC6/14000	22
5960-99-000-4082	A2426	20	5960-99-037-3474	GXB160	84	5960-99-038-0134	TWJ30	52
5960-99-000-5008	6080	20	5960-99-037-3500	BS390	31	5960-99-038-0140	1774B	76
5960-99-000-5018	4J52A	50	5960-99-037-3518	BS714	30	5960-99-038-0196	P8076A	65
5960-99-000-5027	BT5B	7	5960-99-037-3584	C1149/1	16	5960-99-038-0237	BS386	39
5960-99-000-5135	6027	48	5960-99-037-3590	BS440	33	5960-99-038-0248	BS834	30
5960-99-000-5141	BT95	7	5960-99-037-3736	8356	48	5960-99-038-0259	SC7/15000	22
5960-99-000-5167	BM1040	50	5960-99-037-3749	SC5/6000	22	5960-99-038-0260	SC7/E/14000	22
5960-99-000-5173	QS1215	21	5960-99-037-3760	SC5/6800	22	5960-99-038-0276	BS880	30
5960-99-000-6008	24B1	85	5960-99-037-3828	CX1140	8	5960-99-038-0328	BS968	34
5960-99-037-0335	C1134	16	5960-99-037-3829	4CX250B	17	5960-99-038-0329	BS974	34
5960-99-037-0853	SC1-800	22	5960-99-037-3996	BR1160	13	5960-99-038-0340	BS912	30
5960-99-037-2063	BR189	13	5960-99-037-4037	M566W	46	5960-99-038-0456	YD1400	20
5960-99-037-2070	KT88	20	5960-99-037-4038	M570B	46	5960-99-038-0502	BS536	40
5960-99-037-2081	BS502	40	5960-99-037-4039	M569B	46	5960-99-038-0505	BS800	31
5960-99-037-2083	FX227	8	5960-99-037-4040	GXU50	6	5960-99-038-0523	BS838	30
5960-99-037-2084	ZT1011	7	5960-99-037-4063	P831	60	5960-99-038-0524	BS138	30
5960-99-037-2089	BR1162	13	5960-99-037-4077	K391A	41	5960-99-038-0525	BS262	34
5960-99-037-2097	A2599	20	5960-99-037-4188	M577B	45	5960-99-038-0529	BS960	35
5960-99-037-2118	8503	8	5960-99-037-4189	M595B	45	5960-99-038-0530	1774A	76
5960-99-037-2119	N1034S	56	5960-99-037-4192	N1047M	52	5960-99-038-0595	E14-110GM	75
5960-99-037-2120	N1010S	56	5960-99-037-4242	QSC5/6800	22	5960-99-038-0612	SC7/E/15000	22
5960-99-037-2156	CX1140	8	5960-99-037-4288	GXU4	6	5960-99-038-0670	N1094	54
5960-99-037-2162	BS834	30	5960-99-037-4367	CX1159	8	5960-99-038-0688	MAG22	47
5960-99-037-2231	CX1191	8	5960-99-037-4407	T963Z	72	5960-99-038-0752	BS102	32
5960-99-037-2254	0A2WA	21	5960-99-037-4556	24B9	85	5960-99-038-1141	BS958	34
5960-99-037-2288	ACT28A	13	5960-99-037-4602	BR1161	13	5960-99-038-1265	CX1535	9
5960-99-037-2297	BS310	35	5960-99-037-4603	BS816	35	5960-99-038-1713	GXQ350L	84
5960-99-037-2315	C1112	16	5960-99-037-4627	4CX10,000D	17	5960-99-112-1486	BS902	31
5960-99-037-2332	6861	52	5960-99-037-4671	E713B	69	5960-99-118-0160	CX1180	9
5960-99-037-2368	BS732	30	5960-99-037-4672	K3007	41	5960-99-118-0243	A3343	21
5960-99-037-2423	FX2505	8	5960-99-037-4673	M5005	49	5960-99-118-0680	M5032Q	46
5960-99-037-2432	BS836	30	5960-99-037-4688	BS390	31	5960-99-118-0681	M5033Q	46
5960-99-037-2902	CV5819	72	5960-99-037-4689	BS426	31	5960-99-118-0722	1424A/G1	74
5960-99-037-2964	BS510	40	5960-99-037-4690	BS430	31	5960-99-118-0723	1446A/G1	74
5960-99-037-2968	M537A	48	5960-99-037-4913	3073Q	72	5960-99-118-0737	BS876	30
5960-99-037-3109	M554	45	5960-99-037-4952	BS814	35	5960-99-118-0853	SC1/800	22
5960-99-037-3112	M569P	46	5960-99-037-5072	T957Y	72	5960-99-118-1205	1474B	74
5960-99-037-3124	DET29M	21	5960-99-037-5146	4J52A	50	5960-99-118-1449	SC7/15000	22

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5960-99-118-1616	8541	61	6268/4C35	FX2505	8	7624	TT22	16
5960-99-118-1690	4CX35,000C	17	6279/5C22	8503	8	7642	TWS10/7642	53
5960-99-118-1754	TWX22	55	6279A	8503	8	7665*	CX1157	9
5960-99-118-1763	FX2535	8	6326	7038	62	7669	BK492/7669	4
5960-99-118-1788	DET22	21	6334	BS918	33	7670*	BK492/7669	4
5960-99-118-1819	1074H	75	6346*	BK448/5551A	4	7671	BK494/7671	4
5960-99-118-1922	P831S	60	6347*	BK484/5552A	4	7673	BK498/7673	4
5960-99-118-2085	CX1528	10	6348*	BK486/5553B	4	7681	BK544	4
5960-99-118-2273	E14-110GM	75	6354	QS1200	21	7687	7735A	62
5960-99-118-2274	724E	74	6421*	BR1124	13	7703	BK7703	4
5960-99-118-2323	CX1191	8	6511*	BK5822A	4	7735 Series	7735 Series	62
5960-99-118-2347	1324A/2	75	6512*	BK504/5554	4	8008*	AH2532	6
5960-99-118-2449	T9017W	72	6513*	BK46/5555	4	8093 Series	P874	67
5960-99-118-2536	1496B	74	6522	8503	8	8134	8134	62
5960-99-118-2708	SC6/10000	22	6550	KT88	20	8134V1/4811	8134V1/4811	62
5960-99-118-2853	BS386	39	6587	6587	8	8134VB	8134V1/4811	62
5960-99-118-3469	1324M	75	6587A	6587	8	8168	4CX1000A	17
5960-99-118-3525	BS536	40	6625-99-643-9125	BS612	†	8168/4CX1000A	4CX1000A	17
5960-99-118-3526	M5083A	45	6626	0A2WA	21	8170	4CX5000A	17
5960-99-118-3717	BS138	30	6693	AH2511	6	8170/4CX5000A	4CX5000A	17
5960-99-118-3937	BS930	33		BD510	6	8171	4CX10,000D	17
5960-99-118-5075	P8021G IG	58	6696*	BW194	14	8171/4CX10,000D	4CX10,000D	17
5960-99-118-5076	P8021B IG	58	6777	FX2530/6777	8	8252*	C1149/1	16
5960-99-118-5077	P8021R IG	58	6786*	BT69	7	8269*	BR1196	13
5960-99-118-6129	M5091A	45	6807	BT127	7	8270	BT139	7
5960-99-118-7223	BS822	33	6856*	BT125	7	8281	4CX15,000A	17
5960-99-118-8112	BT127	7	6858	BT127	7	8329	8503	8
5960-99-118-8702	4CX15,000A	17	6861	6861	52	8349	4CX35,000C	17
5960-99-118-9438	FX2530/6777	8	6960	BW1162	14	8349/4CX35,000C	4CX35,000C	17
5960-99-196-4635	K3080	41	6961	BR1162	13	8356	8356	48
5960-99-417-6195	GT1C	7	6972	M575	50	8360*	BK492/7669	4
5960-99-417-6220	KT88	20	6975	K3078/6975	41	8370	FX2535	8
5960-99-462-2783	4CX5000A	17	7021	BK448/5551A	4	8424	8503	8
5960-99-522-3862	UFC100/30/120J	28	7028	M599B	47	8438	C1136	16
5960-99-527-9185	TWX34	55	7031	BK484/5552A	4	8480	8480	63
5960-99-531-4899	7ABP7A	72	7034	4CX250B	17	8480V1	8480V1/4810	63
5960-99-537-1816	P863C	60	7038	7038	62	8484	7735B	62
5960-99-537-1817	P863D	60	7041	BK486/5553B	4	8485*	8507A	60
5960-99-539-3452	SC7E/14000	22	7092	B1153	12	8488	6587	8
5960-99-539-3454	SC5/4500	22	7136*	BD510	6	8503	8503	8
5960-99-643-0661	MA91	†	7171	BK476	4	8507	8507	60
5960-99-650-8207	M24-140GJ	73	7182	7182	46	8507A	8507A	60
5960-99-711-9597	M569Q	46	7207*	BK488	4	8521	8521	63
5960-99-714-5244	6027H	48	7226*	7262A	62	8541	8541	61
5960-99-714-5521	6027	48	7226A*	P831	60	8541A	8541A	61
5960-99-716-2965	F21-10LD	72	7237	BR1162	13	8566	8626	61
5960-99-718-4707	BS606	39	7262A	7262A	62	8572	8572A	61
5985-99-519-7065	BS804	36	7263A*	P831	60	8572A	8572A	61
5985-99-519-7066	BS802	36	7290	P8034	62	8604	P844	61
6027	6027	48	7291	7038	62	8625	8625	61
6027H	6027H	48	7293 Series	P875	67	8626	8626	61
6031	BT5B	7	7294 Series	P874	67	8660	4CX1500B	17
6073	0A2WA	21	7295 Series	7295C	67	8673	P882	67
6080	6080	20	7325	7735A	62	8673S	P882	67
6080WA	6080WA	20	7381	BS918	33	8674	P883	67
6093	CV4005	5	7384	CX1140	8	8674S	P883	67
6130	FX227	8	7389 Series	7389C	67	8684	RM101	44
6155*	C1108	16	7527	C1136	16	8748	P872	67
6156*	C1112	16	7568	FX2519A/5949A	8	8749	P873	67
6198	7735A	62	7583/KU82*	FX2530/6777	8	8765	FX2535	8
6240-99-995-6717	RL16	80	7590	FX2519A/5949A	8	8775	P883	67
6240-99-996-4114	XL615/4/3	†	7603	FX2505	8	8803	FX2505	8
6252*	C1134	16	7623	TT21	16	8823	P8037	63

* † Please refer to page 87.

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9549	P874	67	ACM3*	BR1167	13	AX9911	FX2505	8
	P875	67	ACS4	ACS4	17	AX9912	8503	8
9564	7295C	67	ACS5	4CX5000A	17	B1152	B1152	12
9565	7389C	67	ACT25	ACT25	13	B1153	B1153	12
9620*	P849D	61	ACT27	ACT27	13	B1510	B1510	12
9677B	8541A	61	ACT28	ACT28	13	BA9-20	N1010	56
9677C	8541	61	ACT28A	ACT28A	13	BA9-20M*	N1010	56
9677D	P842F	61	ACT70	BR1160	13	BC4392 Series	P8130 Series	59
9677F1	P844	61	AF31-10	3069Q	72		P8400 Series	59
9677F2	P844	61	AFX203	AFX203	7	BC4393	P8132AR	59
9677M	P849D	61	AG866A	GU12	6		P8401AR	59
9677P	P849D	61	AG5209	QS1209/5651	21	BC4394	P8132RF	59
9677S1	8626	61	AG5211	0A2	21		P8401RF	59
9677S2	8541A	61	AH201	GU12	6	BC4532	P8125	64
9677SC	8541A	61	AH205	AH205/857B	6	BC4992 Series	P8130 Series	59
9728	P8031	61	AH205/857B	AH205/857B	6		P8400 Series	59
9728D	P8031F	61	AH211	AH211A	6	BC4993	P8132AR	59
9728Q	P8031Z	61	AH211A	AH211A	6		P8401AR	59
9730	P863	60	AH221	AH221	6	BC4994	P8132RF	59
							P8401RF	59
9812PA	8541	61	AH238	AH238	6	BC7735	7735A	62
9814PA	P831	60	AH2511	AH2511	6	BC8134	8134V1	62
9817PA	8626	61	AH2532	AH2532	6	BC8134B	8134V1B	62
9831	P8037	63	AH2532A	AH2532A	6	BC8480	8480V1	63
10667B	7735B	62	AJ5551	BK448/5551A	4	BC8507	8507A	60
10667F	7038	62	AJ5552	BK484/5552A	4	BC8541	8541A	61
10667G	7735A	62	AJ6346*	BK448/5551A	4	BD510	BD510	6
10667M	P826/4478	62	AJ6347*	BK484/5552A	4	BD512A	BD512A	6
10667S	7735A	62	AL13-36	AL13-36	72	BD512B	BD512B	6
10667SC	7735B	62	AL16-10	F16-10LD	72	BD512C	BD512C	6
38217	5557	7	AL21-12	F21-10LD	72	BD520	BD520	6
55850*	7038	62	AL22-10*	2273D	72	BD520B	BD520B	6
55850F	P844	61	AL22-10LD	2273D	72	BD520C	BD520C	6
55850N	8541	61	AL31-10	3073Q	72	BD520D	BD520D	6
55850S	8541A	61	AN1	GT1C	7	BD522	BD522	6
55851AM	P849D	61	AP31-10	3096Q	72	BD522D	BD522D	6
55851F	P8038	61	AP413	BS990	31	BD524	BD524	6
55875	P8130	59	AR10T	BK484/5552A	4	BEL03a	3B24W	5
55875-IG	P8130 IG	59	AR14T	BK448/5551A	4	BEL2a	GXU1	6
55875B	P8130B	59	AR31	BK66/5550	4	BEL2a-1	GU12	6
55875B-IG	P8130B IG	59	ASG5017	5557	7	BEL5a	GXU2	6
55875G	P8130G	59	ASG5044B	BT125	7	BEL40a	AH205/857B	6
55875G-IG	P8130G IG	59	ASG5045B	BT127	7	BEL125	C1108	16
55875L	P8130L	59	ASG5544	BT125	7	BEL250	C1112	16
55875R	P8130R	59	ASG5545	BT127	7	BEL250CX	4CX250B	17
55875R-IG	P8130R IG	59	ASG6807	BT127	7	BEL400	C1136	16
55876X	P8130X	59	ATC10-50*	U50/15/30	24	BK24	BK484/5552A	4
56032*	BS918	33		U50/20/40	24	BK24/5552A	BK484/5552A	4
68506	68506	6	ATC15-75*	U75/15/40	24	BK34	BK486/5553B	4
A207	A207	5		U80/15/40	24	BK42	BK448/5551A	4
A237	A237	5	ATL10-3*	BR1122	13	BK42/5551A	BK448/5551A	4
A239	3B24W	5		BR1124	13	BK44	BK504/5554	4
A292	A292	5	AW17-20	AW17-20	73	BK44/5554	BK504/5554	4
A2226	A2226	20	AX4-125A/4D21*	C1108	16	BK46	BK46/5555	4
A2293	A2293	20	AX4-250A/5D22*	C1112	16	BK46/5555	BK46/5555	4
A2426	A2426	20	AX224	GXU1	6	BK66	BK66/5550	4
A2521	A2521	20	AX228	GXU3	6	BK66/5550	BK66/5550	4
A2599	A2599	20	AX230	GXU2	6	BK146	BK486/5553B	4
A2900	A2900	20	AX9903/5894*	C178A/5894	16	BK146/5553B	BK486/5553B	4
A3012	A3012	21	AX9903*	C178A/5894	16	BK168	BK5822A	4
A3042	A3042	20	AX9904	BW1165	14	BK168/5822A	BK5822A	4
A3343	A3343	21	AX9904R	BR1165	13	BK178	BK488	4
A3394	YD1400	20	AX9907R	ACS4	17			

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BK394	BK506	4	BR161	BR161	13	BS162	BS162	34
BK416	BK7703	4	BR179	BR179	13	BS166	BS166	36
BK416/7703	BK7703	4	BR189	BR189	13	BS168	BS168	36
BK428	BK472	4	BR191B	BR1160	13	BS172	BS172	31
BK442	BK492/7669	4	BR1102	BR1102	13	BS178	BS178	34
BK442/7669	BK492/7669	4	BR1121	BR1121	13	BS188	BS188	34
BK444	BK494/7671	4	BR1122	BR1122	13	BS190	BS190	32
BK444/7671	BK494/7671	4	BR1124	BR1124	13	BS192	BS192	33
BK446	BK498/7673	4	BR1126	BR1126	13	BS194	BS194	32
BK446/7673	BK498/7673	4	BR1131A	BR1131A	13	BS196	BS196	33
BK448/5551A	BK448/5551A	4	BR1143	BR1143	13	BS200	BS200	33
BK472	BK472	4	BR1151*	BR1161	13	BS202	BS202	33
BK474	BK474	4	BR1160	BR1160	13	BS204	BS204	31
BK476	BK476	4	BR1161	BR1161	13	BS206	BS206	34
BK482	BK482	4	BR1162	BR1162	13	BS216	BS216	34
BK484	BK484/5552A	4	BR1165	BR1165	13	BS217	BS217	34
BK484/5552A	BK484/5552A	4	BR1167	BR1167	13	BS219	BS219	34
BK486	BK486/5553B	4	BR1169	BR1513	13	BS220	BS220	32
BK486/5553B	BK486/5553B	4	BR1181	BR1513	13	BS224	BS224	32
BK488	BK488	4	BR1182	BR1182	13	BS226	BS226	32
BK492/7669	BK492/7669	4	BR1183	BR1183	13	BS228	BS228	33
BK494/7671	BK494/7671	4	BR1195	BR1195	13	BS232	BS232	34
BK496	BK496	4	BR1196	BR1196	13	BS234	BS234	34
BK498/7673	BK498/7673	4	BR1512	BR1512	13	BS248	BS248	35
BK500	BK500	4	BR1512A	BR1512A	13	BS256	BS256	34
BK502	BK502	4	BR1513	BR1513	13	BS258	BS258	34
BK504/5554	BK504/5554	4	BR1513A	BR1513A	13	BS260	BS260	34
BK506	BK506	4	BR1513AF	BR1513AF	13	BS262	BS262	34
BK508	BK508	4	BR1513F	BR1513F	13	BS264	BS264	34
BK514	BK514	4	BR1514	BR1514	13	BS276	BS276	34
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BK5822A	BK5822A	4	BS50L	BS50L	39	BS306	BS306	36
BK7703	BK7703	4	BS50S Series	BS50S Series	39	BS307	BS307	37
BL27	BS918	33	BS50X Series	BS50X Series	39	BS310	BS310	35
BLM-311	RM117	50	BS52	BS52	33	BS314	BS314	33
BLT088	BS192	33	BS58	BS58	31	BS316	BS316	33
BLT119	BS110	31	BS60	BS60	36	BS320	BS320	33
BM25L	RM101	44	BS66	BS66	36	BS324	BS324	31
BM25LE	BM25LE	44	BS70	BS70	36	BS332	BS810	33
BM1001	M5125	44	BS72	BS72	36	BS338	BS338	36
BM1001A	M5125	44	BS76	BS76	36	BS340	BS340	39
BM1002	BM1002	48	BS80	BS80	36	BS342	BS342	39
BM1003	BM1003	46	BS82	BS82	35	BS344	BS344	39
BM1004	BM1004	46	BS84	BS84	35	BS348	BS348	31
BM1005	BM1005	46	BS90	GXA95	84	BS366	BS366	40
BM1006	BM1006	46	BS92	BS92	35	BS384	BS384	39
BM1026	BM1026	50	BS100	DA100	12	BS386	BS386	39
BM1027	BM1027	50	BS102	BS102	32	BS390	BS390	31
BM1028	BM1028	50	BS104	BS104	31	BS392	BS392	36
BM1029	BM1029	50	BS110	BS110	31	BS402	BS402	36
BM1030	BM1030	50	BS114	BS114	35	BS412	BS412	35
BM1031	BM1031	49	BS116	BS116	35	BS426	BS426	31
BM1032	BM1032	50	BS118	BS118	35	BS430	BS430	31
BM1033	BM1033	50	BS120	BS120	36	BS440	BS440	33
BM1034	BM1034	50	BS122	BS122	34	BS450	BS450	33
BM1035	BM1035	50	BS128	BS128	30	BS452	BS452	33
BM1036	BM1036	50	BS130	BS206	34	BS454	BS454	35
BM1037	BM1037	50	BS138	BS138	30	BS460	BS460	36
BM1038	BM1038	50	BS148	BS148	35	BS462	BS462	33
BM1039	BM1039	50	BS156	BS156	33	BS466	BS466	33

* † Please refer to page 87.

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BS470	GXE30	84	BS732	BS732	30	BS927	BS927	35
BS500	BS500	34	BS748	BS748	37	BS928	BS928	33
BS502	BS502	40	BS750	BS750	38	BS930	BS930	33
BS504	BS504	40	BS752	BS752	38	BS932	BS932	31
BS506	BS510	40	BS756	BS756	38	BS940	BS940	30
BS510	BS510	40	BS758	BS758	38	BS946	BS946	31
BS512	BS512	40	BS760	BS760	38	BS950	BS950	35
BS514	BS514	40	BS762	BS762	38	BS952	BS952	34
BS516	BS516	40	BS764	BS764	38	BS956	BS956	33
BS522	BS522	40	BS774	BS774	38	BS958	BS958	34
BS524	BS524	40	BS776	BS776	38	BS959	BS959	34
BS526	BS526	40	BS778	BS778	38	BS960	BS960	35
BS528	BS528	40	BS784	BS784	38	BS962	BS962	35
BS530	BS530	40	BS788	BS788	38	BS966	BS966	32
BS532	BS532	40	BS798	BS798	30	BS968	BS968	34
BS534	BS534	40	BS800	BS800	31	BS969	BS969	35
BS536	BS536	40	BS802	BS802	36	BS970	BS970	33
BS538	BS538	40	BS804	BS804	36	BS974	BS974	34
BS540	BS540	40	BS806	BS806	36	BS975	BS975	35
BS546	BS546	40	BS807	BS807	36	BS976	BS976	34
BS548	BS548	37	BS810	BS810	33	BS977	BS977	35
BS582	BS582	37	BS814	BS814	35	BS986	BS986	30
BS600	BS600	40	BS815	BS815	35	BS990	BS990	31
BS602A	BS602A	40	BS816	BS816	35	BS994	BS994	31
BS604	BS604	39	BS818	BS818	35	BS1002	BS1002	37
BS606	BS606	39	BS822	BS822	33	BT5	BT5	7
BS608	BS608	37	BS824	BS824	31	BT5B	BT5B	7
BS610 Series	BS610 Series	38	BS826	BS826	35	BT17	BT17	7
BS614	BS614	40	BS828	BS828	35	BT19	BT19	7
BS616	BS616	37	BS830	BS830	35	BT29	BT29	7
BS620	BS620	39	BS832	BS832	31	BT69	BT69	7
BS624	BS624	37	BS834	BS834	30	BT69F	BT69F	7
BS630	BS630	37	BS836	BS836	30	BT69G	BT69G	7
BS632	BS632	39	BS838	BS838	30	BT77	BT127	7
BS638	BS638	39	BS842	BS842	33	BT77A	BT127	7
BS640	BS640	38	BS844	BS844	35	BT79	FX227	8
BS642	BS642	39	BS846	BS846	31	BT83	8503	8
BS644	BS644	38	BS848	BS848	31	BT91	BT125	7
BS646	BS646	38	BS850	BS450	33	BT91A	BT125	7
BS648	BS648	38	BS854	BS854	30	BT95	BT95	7
BS650	BS650	38	BS856	BS856	32	BT95B	BT95B	7
BS652	BS652	36	BS858	BS858	32	BT109	BT127	7
BS658	BS658	38	BS860	BS860	33	BT125	BT125	7
BS660	BS660	38	BS864	BS864	36	BT127	BT127	7
BS662	BS662	38	BS868	BS868	31	BT127A	BT127A	7
BS674	BS674	38	BS870	BS870	30	BT129	BT129	7
BS676	BS676	38	BS872	BS872	30	BT135	BT135	7
BS678	BS678	38	BS874	BS874	30	BT137	BT137	7
BS684	BS684	39	BS876	BS876	30	BT139	BT139	7
BS690	BS690	38	BS880	BS880	30	BT141	BT141	7
BS692	BS692	38	BS882	BS882	35	BT141A	BT141A	7
BS694	BS694	37	BS888	BS888	36	BT143	BT143	7
BS696	BS696	39	BS894	BS894	31	BT145	BT145	7
BS698	BS698	38	BS898	BS898	30	BT145A	BT145A	7
BS702	BS702	30	BS902	BS902	31	BT145B	BT145B	7
BS710	BS710	30	BS904	BS904	31	BT147	BT147	7
BS714	BS714	30	BS908	BS908	35	BT147A	BT147A	7
BS716	BS716	30	BS910	BS910	30	BT149	BT149	7
BS718	BS718	30	BS912	BS912	30	BT149A	BT149A	7
BS720	BS720	30	BS914	BS914	33	BT153	BT153	7
BS724	BS724	30	BS915	BS915	33	BTL6-1*	BR179	13
BS726	BS726	30	BS916	BS916	31		BR1124	13
BS728	BS728	30	BS918	BS918	33	BTL15-2*	BR161	13

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BTL15-2*	BR1102	13	BY1144L	BY1144L	15	CCT10	CCT10	83
BTR596	BS452	33	BY1151*	BY1161	15	CE309	5557	7
BTR640	BS76	36	BY1161	BY1161	15	CF3C6.5	UFC6/30/140J	28
BW179	BW179	14	BY4030	BY4030	15	CF3C12	UFC12/30/140J	28
BW189	BW189	14	BY4031	BY4031	15	CF3C18.5	UFC18/30/140J	28
BW194	BW194	14	BY4032	BY4032	15	CF3C25	UFC25/30/140J	28
BW1102	BW1102	14	BY4033	BY4033	15	CF3C34	UFC34/30/140J	28
BW1102J2	BW1102J2	14	BY4036	BY4036	15	CF3C43	UFC43/30/140J	28
BW1121	BW1121	14	BY4037	BY4037	15	CF3C50	UFC50/30/140J	28
BW1121J1	BW1121J1	14	BY4038	BY4038	15	CF3C450*	UFC450/30/200J	28
BW1121J2	BW1121J2	14	BY4038A	BY4038A	15	CF3C1000E	UFC1000/30/200J	28
BW1122	BW1122	14	BY4039	BY4039	15	CF3C2000*	UFC2000/20/200J	28
BW1124	BW1124	14	BY4048A	BY4048A	15	CFED450	UFC450/12/125J	28
BW1124J1	BW1124J1	14	BY4049	BY4049	15		UFC450/15/125J	28
BW1124J2	BW1124J2	14	BY4059	BY4059	15	CFED500	UFC500/12/125J	28
BW1143	BW1143	14	BY4060	BY4060	15		UFC500/15/125J	28
BW1143J2	BW1143J2	14	BY4063	BY4063	15	CFED1000	UFC1000A/12/125J	28
BW1156	BW1156	14	BY4064	BY4064	15		UFC1000A/15/125J	28
BW1161	BW1161	14	BY4093	BY4093	15			
BW1162	BW1162	14	C1A*	AFX203	7			
BW1162J3	BW1162J3	14	C3J	ZT1011	7	CFFP2000	UFC2000/20/200J	28
BW1165	BW1165	14	C3JA	ZT1011	7	CFHD76	UFC76/30/120J	28
BW1165J3	BW1165J3	14	C6J*	BT127	7	CFHD100	UFC100/30/120J	28
BW1169J3*	BW1513J2	14	C6J-A*	BT127	7	CFHE6.5	UFC6/30/140J	28
BW1176J1	BW1176J1	14	C6J-K*	BT127	7	CFHE12	UFC12/30/140J	28
BW1176J2	BW1176J2	14	C6J-KNe*	BT127	7	CFHE18.5	UFC18/30/140J	28
BW1181J3	BW1181J3	14	C102A	P8031	61	CFHE25	UFC25/30/140J	28
BW1182J1	BW1182J1	14	C102B	8541	61	CFHE34	UFC34/30/140J	28
BW1182J2	BW1182J2	14	C103A	P8030	61	CFHE40	UFC40/30/140J	28
BW1183J1	BW1183J1	14	C103B	8541A	61	CFHE43	UFC43/30/140J	28
BW1183J2	BW1183J2	14	C104A*	P844	61	CFHE50	UFC50/30/140J	28
BW1184J2	BW1184J2	14	C104B	P844	61	CFHP450	UFC450/30/200J	28
BW1185J2	BW1185J2	14	C105A	P8031Z	61	CFHP1000	UFC1000/30/200J	28
BW1195	BW1195	14	C105B	P849Z	61	CMV1-500	UCM500/5/25	26
BW1195J3	BW1195J3	14	C178A	C178A/5894	16	CMV1-2000	UCM2000/5/40	26
BW1196	BW1196	14	C178A/5894	C178A/5894	16	CO43*	N1010	56
BW1196J3	BW1196J3	14	C910/2325	3069R	72	CO119*	N1034	56
BW1513J2	BW1513J2	14	C932*	7735A	62	COL5-1	4CX5000A	17
BW1513J2F	BW1513J2F	14	C933*	7038	62	CR144A	CR144A	74
BW1514J2	BW1514J2	14	C960	P874	67	CR1501	CR1501	17
BW1514J2F	BW1514J2F	14		P875	67	CR1502	CR1502	17
BW1515J2F	BW1515J2F	14	C962	P874	67	CT1-500	BT19	7
BW4027	BW4027	14	C1108	C1108	16	CT1-2500	BT5B	7
BW4028	BW4028	14	C1111*	C1150/1	16	CV1C300E	UC300/10/70J	26
BW4029	BW4029	14	C1112	C1112	16	CV1C1500E	UC1500/8/125J	26
BW4034	BW4034	14	C1123	4D32	16		UC1500/10/125J	26
BW4035	BW4035	14	C1133*	C1149/1	16	CV1C2300E	UC2300/8/125J	26
BW4050	BW4050	14	C1134	C1134	16		UC2300/8/125JB	26
BW4070	BW4070	14	C1136	C1136	16		UC2300/10/125J	26
BW4088A	BW4088A	14	C1148	C1148	16	CV2C250E	UC250/25/125J	26
BW4088B	BW4088B	14	C1149	C1149/1	16	CV2C450E	UC450/25/125J	26
BW4215	BW4215	14	C1149/1	C1149/1	16	CV2C750E	UC750/20/150J	26
BWS1	BWS1	56	C1150	C1150/1	16		UC750/20/150JA	26
BWS2	BWS2	56	C1150/1	C1150/1	16	CV2C1000E	UC1000/20/150J	26
BW X5	BW X5	56	C1166	C1166	16		UC1000/20/150JA	26
BY189A	BY189A	15	C1534	C1534	16	CV2C1500E	UC1500/20/150J	26
BY194	BY194	15	C9132A	P8031	61	CV2C2000E	UC2000/20/150J	26
BY1102	BY1102	15	C9133A	P8031	61	CV2W1200E	UCW1200/20/500	27
BY1121	BY1121	15	C9138A	P8031	61	CV3C250E	UC250/30/150J	26
BY1122	BY1122	15	C23174	P8123	60	CV3C450E	UC450/30/150J	26
BY1124	BY1124	15	C23219	P8202	60	CV3C450F	UFC450/30/200J	28
BY1143	BY1143	15	CCS1	CCS1	16	CV3C650E	UC650/30/150J	26
BY1144	BY1144L	15	CCS3	YL1550	16	CV3C1000E	UC1000/30/150J	26

* † Please refer to page 87.

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CV3W650E	UCW650/30/500	27	CV2181	BS104	31	CV2868	AFX203	7
CV3W-1000*	UCW1000/30/500	27	CV2186	BM1031	49	CV2957	5557	7
CV5	AH221	6	CV2210	BT125	7	CV2984	6080	20
CV32	GU12	6	CV2215	BT127	7	CV2993	8503	8
CV187	U19	5	CV2225	QS1200	21	CV3518*	CX1140	8
CV273	DET22	21	CV2231	A2226	20	CV3521	FX2519A/5949A	8
CV284	QS75/20	21	CV2261	BM1038	50	CV3528	M513A	48
CV287	QS150/15	21	CV2262	BM1039	50	CV3540*	8503	8
CV294	BS710	30	CV2274	BS114	35	CV3543	4D32	16
CV295	GXA85	84	CV2281	M537A	48	CV3611	5586	46
CV354	DET23	21	CV2284	4J50A	50	CV3629	FX227	8
CV372	FX227	8	CV2285	BS702	30	CV3670	AH2532	6
CV397	DET24	21	CV2306	BS156	33	CV3676	2J42	48
CV402	GXA80	84	CV2307	BS158	33	CV3745	BS58	31
CV403	24B9	85	CV2308	BS116	35	CV3789	CV3789	20
CV427	C1150/1	16	CV2309	BS118	35	CV3840	BS462	33
CV429	3069M	72	CV2311	BS200	33	CV3926	BR1165	13
CV429A	MF31-55	72	CV2312	BS202	33	CV3958	5657	46
CV436	ACT25	13	CV2313	BM1032	50	CV3982	M506A	49
CV447	BT141	7	CV2319	BM1006	46	CV3997	M513B	48
CV449	QS1209/5651	21	CV2322	BR161	13	CV4005	CV4005	5
CV460	BS48	35	CV2323	BR179	13	CV4020	0A2WA	21
CV461	BS92	35	CV2341	CV2341	20	CV4048	QS1212	21
CV462	BS84	35	CV2343	K335	41	CV4054	QS1213	21
CV463	BS82	35	CV2359	BS156	33	CV4079	CV4079	20
CV482	A237	5	CV2376	M521	49	CV4080	75C1	21
CV488	GXA95	84	CV2378	BS718	30	CV4082	A2426	20
CV513	4J53	45	CV2379	BS720	30	CV4100	0A2WA	21
CV532	AH211A	6	CV2381	N1034A	56	CV5008	6080WA	20
CV1067	L63	20	CV2393	N1010A	56	CV5018	4J52A	50
CV1075	KT66	20	CV2394	DA42	12	CV5027	BT5B	7
CV1128	GT1C	7	CV2397	DET29	21	CV5135	6027	48
CV1144	BT19	7	CV2399	GXU3	6	CV5141	BT95	7
CV1147	BT5	7	CV2412	M523	50	CV5167	BM1040	50
CV1219	DA100	12	CV2416*	C1149/1	16	CV5173	QS1215	21
CV1435	AH221	6	CV2424	M549	50	CV5207	1B59	70
CV1522	CV1522	74	CV2425	M539	50	CV5218	BR189	13
CV1629	AH238	6	CV2426	M529	50	CV5219	ACS4	17
CV1742	BK504/5554	4	CV2430	BS716	30	CV5220	KT88	20
CV1743	GXA60	84	CV2453	CV2453	20	CV5234	ZT1011	7
CV1787	FX2505	8	CV2456	SC1/350	22	CV5239	BR1162	13
CV1832	0A2	21	CV2457	SC1/400	22	CV5242	A2599	20
CV1835	GXU1	6	CV2458	SC1/600	22	CV5247	FX2505	8
CV1841	BS52	33	CV2459	SC1/800	22	CV5249	K3078/6975	41
CV1858	GXA130	84	CV2460	SC1/1000	22	CV5282	AL13-36	72
CV1859	GXA160	84	CV2461	SC1/1200	22	CV5285	QS1212	21
CV1866	2J42	48	CV2462	SC1/1400	22	CV5300*	2273D	72
CV1881	BS384	39	CV2463	2269Y	72	CV5326	ACT28A	13
CV1897	4J34	45	CV2473	M538A	50	CV5343	C1112	16
CV1898	4J35	45	CV2481	BS932	31	CV5362	6861	52
CV1914	4J31	45	CV2482	BS838	30	CV5398	BS732	30
CV1916	4J33	45	CV2488	BS724 Series	30	CV5427	FX2505	8
CV1923	BS810	33	CV2494	K351	41	CV5438	TWC5	54
CV1932	L63	20	CV2518	GXU2	6	CV5458	DET22E	21
CV2012*	QS1209/5651	21	CV2520	8503	8	CV5721*	CX1140	8
CV2124	BK484/5552A	4	CV2673	AH205/857B	6	CV5819	T957Y	72
CV2130	C1108	16	CV2744	CV2744	45		30730	72
CV2131	C1112	16	CV2775	68506	6	CV5844	SC2/3000	22
CV2138	GM4	82	CV2797	C178A/5894	16	CV5923	M554	45
CV2139	EHM2S	82	CV2799	C1134	16	CV5956	DET22	21
CV2157	BS710	30	CV2815	GXU2	6	CV5959	C1136	16
CV2160	A207	5	CV2826	BS914	33	CV5962	DET22D	21
CV2163	ACT28	13	CV2858	3B24W	5	CV5968	GXU6	6

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CV5985	K359	41	CV8161	0A2	21	CV11039	TWC14	54
CV5990	BS204	31	CV8168	0A2WA	21	CV11107	4CX35,000C	17
CV5991	BS286	31	CV8198	5842	20	CV11154	M5035	46
CV5992	M578B	45	CV8232	6080WA	20	CVCC2500	UC2500/5/60J	26
CV5998	A292	5	CV8286	TT21	16	CVDD300	UC300/10/70J	26
CV5999	M570	46	CV8293	T957Y	72	CVDD1000	UC1000/8/125J	26
CV6005	BS502	40		3073Q	72		UC1000/10/125J	26
CV6007	FX227	8	CV8295	4CX5000A	17	CVDP1500	UC1500/8/125J	26
CV6008	24B1	85	CV8296	GXB160	84		UC1500/10/125J	26
CV6022	8503	8	CV8317	BS390	31	CVDP2300	UC2300/10/125J	26
CV6023	N1034S	56	CV8404	FX2519A/5949A	8		UC2300/8/125J	26
CV6024	N1010S	56	CV8505	8356	48		UC2300/8/125JB	26
CV6028	BS834	30	CV8530	SC5/6000	22	CVFP250	UC250/25/125J	26
CV6051	CX1191	8	CV8563	CX1140	8	CVFP450	UC450/25/125J	26
CV6065	SC1/1600	22	CV8632	CR144A	74	CVFP750	UC750/20/150J	26
CV6066	SC1/1800	22	CV8671	GXK20	84		UC750/20/150JA	26
CV6067	SC1/2000	22	CV8699	4CX10,000D	17	CVFP1000	UC1000/20/150J	26
CV6070	BS310	35	CV8730	BR1160	13		UC1000/20/150JA	26
CV6085	TWS6	53	CV8771	M566	46	CVFP1500	UC1500/20/150J	26
CV6086	BS836	30	CV8772	M570	46	CVFP2000	UC2000/20/150J	26
CV6091	A2900	20	CV8773	M569	46	CVHP250	UC250/30/150J	26
CV6107	BS510	40	CV8774	GXU50	6	CVHP450	UC450/30/150J	26
CV6108	M537A	48	CV8797	P831	60	CVHP650	UC650/30/150J	26
CV6117	TWS7	53	CV8904	M577B	45	CVHP1000	UC1000/30/150J	26
CV6129	BS714	30	CV8905	M595B	45	CW1600J2	CW1600J2	18
CV6131	C1149/1	16	CV8908	N1047M	52	CWV1-1000-50S*	UCW1000/30/500	27
CV6132	BS440	33	CV8960	QSC5	22	CX1119	CX1140	8
CV6142	K391A	41	CV8978	A2426	20	CX1120	CX1191	8
CV6157	TWS6	53	CV9006	GXU4	6	CX1140	CX1140	8
CV6167	T963Z	72	CV9080	CX1159	8	CX1154	CX1154	9
CV6169	BS915	33	CV9335	T957Z	72	CX1154B	CX1154B	9
CV6172	T989Z	72	CV9335*	3069Q	72	CX1157	CX1157	9
CV6173	24B9	85	CV9343	BR1161	13	CX1159	CX1159	8
CV6178	BS816	35	CV9422	E713B	69	CX1164	CX1164	9
CV6179	TWS17	52	CV9423	K3007	41	CX1168	CX1168	9
CV6180	TWC18	52	CV9424	M5005	49	CX1168B	CX1168B	9
CV6181	TWX19	52	CV9442	BS390	31	CX1171	CX1171	9
CV6184	4CX10,000D	17	CV9443	BS426	31	CX1171B	CX1171B	9
CV6192	BS814	35	CV9444	BS430	31	CX1174	CX1174	9
CV6194	K391	41	CV9492	K311	†	CX1174B	CX1174B	9
CV6206	BS818	35	CV9510	1374R	74	CX1175	CX1175	9
CV6207	BS826	35	CV9833	M554	45	CX1175B	CX1175B	9
CV6217	769H	73	CV9874	T957Y	72	CX1180	CX1180	9
CV6229	1478K	73		3073Q	72	CX1191	CX1191	8
CV6240	P896A	†	CV9918	4CX1000A	17	CX1191A	CX1191A	8
CV6241	CX1157	9	CV10210	M577B	45	CX1191D	CX1191D	8
CV6243	P863	60	CV10332	6080	20	CX1192	CX1192	9
CV8001	M569	46	CV10361	ACM3	13	CX1192B	CX1192B	9
CV8002	M579	46	CV10368	BR1122	13	CX1193	CX1193	9
CV8026	DET23	21	CV10369	ACS4	17	CX1193B	CX1193B	9
CV8051	A207	5	CV10404	C1166	16	CX1199	CX1199	9
CV8062	GXU3	6	CV10406	8626	61	CX1199B	CX1199B	9
CV8064	A2521	20	CV10466	4KM50,000LR	43	CX1525	CX1525	10
CV8067	C1134	16	CV10470*	1478E	72	CX1526A	CX1526A	10
CV8089	A2293	20	CV10611	N1034S	56	CX1526B	CX1526B	10
CV8091	7182	46	CV10664	150C4	21	CX1527A	CX1527A	10
CV8092	7182	46	CV10703	T940R	75	CX1527B	CX1527B	10
CV8093	7182	46	CV10704	T940B	75	CX1528	CX1528	10
CV8096	M566	46	CV10705	T940G	75	CX1529	CX1549	10
CV8097	M566	46	CV10757	F21-10LD	72	CX1530	CX1530	9
CV8098	M573	46	CV10758	M599B	47	CX1535	CX1535	9
CV8114	7ABP7A	72	CV10949	T989Z	72	CX1535A	CX1535A	9
CV8132	C1134X	†	CV10951	T988Z	72	CX1536	CX1536	10

* † Please refer to page 87.

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CX1545	CX1545	9	E720D	E720D	69	FX38C-3	XL615/4/3	69
CX1545B	CX1545B	9	E725	E725	69	FX42C-3	XL615/7/3	69
CX1549	CX1549	10	E727	E727	70	FX47A	XL615/13/6.5	69
CX1558	CX1558	8	E728	E728	70	FX47C-6.5	XL615/13/6.5	69
CX1559	CX1559	8	E729	E729	70	FX219	8503	8
CX1570	CX1570	9	E731	E731	70	FX225	FX2505	8
CX1571	CX1571	9	E732	E732	70	FX227	FX227	8
CX1572	CX1572	9	E733	E733	70	FX231	8503	8
CX1573	CX1573	9	E734	E734	70	FX290	8503	8
CX1574	CX1574	9	E3033	4CX10,000D	17	FX297	FX297	8
CY1170J	CY1170J	18	E3509	M5131	49	FX2501	FX2501	8
CY1172	CY1172	18	E3513	M599F	47	FX2503	FX2503	8
CY4120	CY4120	18	ECC230	6080	20	FX2505	FX2505	8
D10-280GH	D10-280GH	74	ECS3-30*	U30/15/20	24	FX2517	FX2535	8
D13-47GH	D13-47GH	74	EE17	5557	7	FX2519A/5949A	FX2519A/5949A	8
DA42	DA42	12	EHM2S	EHM2S	82	FX2525	FX2525	8
DA100	DA100	12	EHT7B	EHT7B	12	FX2530/6777	FX2530/6777	8
DA100B	DA100B	12	EL37	KT66	20	FX2535	FX2535	8
DCG4/1000G	GU12	6	EM15LS	RM101	44	G Ozotron	G Ozotron	85
DCG4/5000*	AH221	6	EP751	EP751	69	G100A*	AH205/857B	6
	AH238	6	ES105	M5063/2J70B	45	G151	G151	82
DCG6-18	AH2511	6	ES1101	DA42	12	G1070	G1070	82
DCG6/18GB	BD510	6	ES1102	DA100	12	GB6	GB6	82
DCG7-100	BT69G	7	ESA1500*	BR1126	13	GB12	GB12	82
DCG7-100A	BT69F	7	ESU77*	A207	5	GCS50/150*	U150/15/40	24
DCX4/1000	GXU1	6	ESU103	GXU1	6	GD75P*	75C1	21
DCX4/5000	GXU2	6	ESU150*	AH238	6	GD85M/S	QS1209/5651	21
DET22	DET22	21	ESU200*	AH221	6	GD85PR/S	QS1212	21
DET22D	DET22D	21	ESU866	GU12	6	GD90M	QS1215	21
DET22E	DET22E	21	F13-110GR	F13-110GR	73	GD150M	150C4	21
DET22R	DET22R	21	F16-10LD	F16-10LD	72	GD150M/S	0A2	21
DET23	DET23	21	F16-101LD	F16-101LD	72	GD150P/S	QS1200	21
DET24	DET24	21	F17-10LD	7ABP33A	72	GHT3/CV5721*	CX1140	8
DET29	DET29	21	F21-10LD	F21-10LD	72	GHT8	CX1528	10
DET29M	DET29M	21	F21-130GR	F21-130GR	72	GHT9	CX1549	10
DET40	DET40	12	F21-140GR	F21-140GR	72	GHT11	CX1526	10
DET41	DET41	12	F31-10LB*	3077R	72	GHT12	CX1527	10
DQ2	GU12	6	F31-10LC*	3069R	72	GL4-250A/5D22*	C1112	16
DQ4	AH2532	6	F31-10LG	3077R	72	GL4D21/4-125A*	C1108	16
DQ4*	AH238	6	F31-11LC	3069Q	72	GL57	BT5B	7
				T957Z	72	GL415	BK66/5550	4
DQ4a	AH2532A	6	F31-11LD*	3073Q	72	GL678*	BT95	7
DQ4a*	AH221	6	F31-12LC*	3069R	72	GL857B*	AH205/857B	6
DQ7*	AH205/857B	6	F31-13LC	3069R	72	GL5544	BT125	7
DQ45	BD522	6	F31-111LC	3069Q	72	GL5545	BT127	7
DQ45d	BD522D	6	F31-111LD	3073Q	72	GL5550	BK66/5550	4
DQ51	BD520	6	F41-140LC	4169B	72	GL5551A	BK448/5551A	4
DQ51b	BD520B	6	F575A*	AH2511	6	GL5552A	BK484/5552A	4
DQ51c	BD520C	6	F857B*	AH205/857B	6	GL5553B	BK486/5553B	4
DQ51d	BD520D	6	FG17	5557	7	GL5554	BK504/5554	4
DQ61*	AH2511	6	FG27A*	BT5B	7	GL5555	BK46/5555	4
DR857B	AH205/857B	6	FG33	BT5B	7	GL5720	BT5B	7
DX2	GXU1	6	FG57	BT5B	7	GL5822A	BK5822A	4
DX423	M5163	51	FG235	BK484/5552A	4	GL5894*	C178A/5894	16
E14-110GM	E14-110GM	75	FG238B	BK46/5555	4	GL6346*	BK448/5551A	4
E36*	FX2535	8	FG258	BK486/5553B	4	GL6347*	BK484/5552A	4
E37B	FX2535	8	FG259B	BK504/5554	4	GL6348*	BK486/5553B	4
E38	FX2535	8	FG271	BK448/5551A	4	GL6511*	BK5822A	4
E125A*	C1108	16	FTL3-1*	BR1162	13	GL6512*	BK504/5554	4
E250A*	C1112	16		BR1196	13	GL6513*	BK46/5555	4
E702E	E702E	69	FTL3-2*	BR1162	13	GL6807	BT127	7
E713B	E713B	69	FTL8-1*	BR1124	13	GL6858	BT127	7
E720A	E720A	69	FTW3-1*	BW1162	14	GL7171	BK476	4
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GL7669	BK492/7669	4	HS200	7038	62	K386	K386	43
GL7671	BK494/7671	4	HS201	7735A	62	K386W	K386W	43
GL7673	BK498/7673	4	HT415*	8503	8	K391	K391	41
GL7681	BK544	4	HY5	CX1528	10	K391A	K391A	41
GL7703	BK7703	4	HY1102*	CX1570	9	K3003	K3081	41
GL37207*	BK488	4		CX1571	9	K3004	K3004	42
GL37248	BK508	4	HY1302*	CX1572	9	K3005	K3005	42
Gle15000/1.5/6*	AH238	6		CX1573	9	K3006	K3006	42
Gle15000/3/12	BD510	6	ITK3-1*	BW1195J3	14	K3007	K3007	41
	AH2511	6	ITK5-1*	BW1196J3	14	K3017	K3217H	42
GM4	GM4	82	ITK8-1*	BW1513J2	14	K3018	K3218H	42
GM4LB	GM4LB	82	ITK10-1*	BW1513J2	14	K3019	K3219H	42
GT1C	GT1C	7	J Ozotron	J Ozotron	85	K3020	K3091	41
GTR150M/S	QS150/15	21	JCS1-25	UF25/10/40	27	K3020A	K3097	41
GU12	GU12	6	JCS1-50	UF50/10/40	27	K3035	K3035	41
GU18	AH238	6	JCS1-75	UF75/10/40	27	K3038	K3038	41
GU20/21*	AH221	6	JCS1-100	UF100/10/40	27	K3039	K3039	41
	AH238	6	JCS1-150	UF150/10/40	27	K3069	K3069	41
GU23*	AH221	6	JCS1-250	UF250/8/40	27	K3071	K3071	41
GU25	GU25	6	JF20	BS824	31	K3073	K3073	41
GX/SG4/20	GXK20	84	JF20D	BS832	31	K3076	K3076	41
GX/SG4/30	GXK30	84	JP9-2.5D	M599A	47	K3077	K3077	41
GX/SG11/80	GXK80	84	JP9-2.5E	M599B	47	K3078/6975	K3078/6975	41
GXA Series	GXA Series	84	JP9-2.5F	M599A	47	K3079	K3079	41
GXB Series	GXB Series	84	JP9-2.5H	M5064H	47	K3080	K3080	41
GXC Series	GXC Series	84	JP9-7	2J42	48	K3081	K3081	41
GXE Series	GXE Series	84	JP9-7D	M503A	48	K3082	K3282	42
GXF Series	GXF Series	84	JP9-7L	M5031	48	K3083	K3283	42
GXH Series	GXH Series	84	JP9-7M	M5019	48	K3084	K3284	42
GXK Series	GXK Series	84	JP9-15	M513B	48	K3090	K3090	41
GXL Series	GXL Series	84	JP9-15B	BM1002	48	K3091	K3091	41
GXM5A	GXM5A	84	JP9-18	M598B	48	K3094	K3094	41
GXM12/1	GXP12	84	JP9-22L	M5105	49	K3097	K3097	41
GXM15/2	GXN15	84	JP9-50A	2J55	49	K3098	K3098	41
GXM70	GXM70	84	JP9-75	M575	50	K3111	K3111	41
GXN Series	GXN Series	84	JP9-80	4J52A	50	K3118	K3118	41
GXP Series	GXP Series	84	JP9-250	4J50A	50	K3217	K3217H	42
GXQ Series	GXQ Series	84	JP9-250B	M529	50	K3217H	K3217H	42
GXR Series	GXR Series	84	JP9-250D	M539	50	K3218	K3218H	42
GXS Series	GXS Series	84	JP9-250E	M549	50	K3218H	K3218H	42
GXU1	GXU1	6	JP9-250F	M538A	50	K3219	K3219H	42
GXU2	GXU2	6	K12/2L	UFC12/32/100	28	K3219H	K3219H	42
GXU3	GXU3	6	K16/2L	UFC16/32/100	28	K3276H	K3276H	42
GXU4	GXU4	6	K25/2L	UFC25/32/100	28	K3277H	K3277H	42
GXU5	GXU5	6	K50/2L	UFC50/32/100	28	K3278H	K3278H	42
GXU6	GXU6	6	K100/2L	UFC100/24/100	28	K3282	K3282	42
GXU50	GXU50	6	K335	K335	41	K3283	K3283	42
GXU51	GXU51	6	K347	K347A	43	K3284	K3284	42
GXV Series	GXV Series	84	K347A	K347A	43	K4019A	K4019A	42
GXW Series	GXW Series	84	K351	K351	41	K4140	K4140	42
GXX Series	GXX Series	84	K359	K359	41	K4141	K4141	42
H Ozotron	H Ozotron	85	K365	K365	42	K4142	K4142	42
H13B Arrester	H13B Arrester	80	K370	K370	42	K4145	K4145	42
H8362A	H8362A	59	K370W	K370W	42	K4146	K4146	42
H8397A	H8397A	59	K371	K371	42	K4147	K4147	42
H8398	H8398	59	K371W	K371W	42	K4148	K4148	43
H9311A	H9311A	59	K372	K372	42	K4148W	K4148W	43
H9313	H9313	59	K372W	K372W	42	K4170	K4170	42
H9324	H9324	59	K376	K376	42	K4171	K4171	42
H9326	H9326	59	K377	K377	42	K4172	K4172	42
H9336	H9336	59	K383	K383	42	K4195	K4195	42
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K4201	K4201	42	M537A	M537A	48	M5015	M5125	44
K4202	K4202	42	M538	M538A	50	M5019	M5019	48
K4203	K4203	42	M538A	M538A	50	M5020	M5020	45
KS9-30	K3078/6975	41	M539	M539	50	M5021	M5021	47
KS9-40*	K3081	41	M542	5586	46	M5022	M5022	49
KS9-40B*	K3091	41	M543	7182	46	M5023	M5023	48
KS9-40D*	K3081	41	M549	M549	50	M5024	M5024	48
KT66	KT66	20	M551	4J52A	50	M5025	M5025	48
KT77	KT77	20	M554	M554	45	M5028	M5028	44
KT88	KT88	20	M559	8356	48	M5030	M5030A	46
KU15	FX227	8	M565	M565	45	M5030A	M5030A	46
KU17	FX2535	8	M566	M566	46	M5031	M5031	48
KU25	8503	8	M569	M569	46	M5032	M5032	46
KU29	6587	8	M570	M570	46	M5033	M5033	46
KU42	FX227	8	M573	M573	46	M5034	M5034A	46
KU54*	CX1140	8	M574	M574	46	M5034A	M5034A	46
KU72*	CX1157	9	M575 Series	M575 Series	50	M5035	M5035	46
KU74*	CX1528	10	M577	M577B	45	M5039	M5039	48
KU81	FX2535	8	M577A	M577B	45	M5042	M5042S	50
KU99	FX227	8	M577B	M577B	45	M5042S	M5042S	50
KU275C*	CX1525	10	M578	M578B	45	M5043	M5043	48
KU401	FX2505	8	M578A	M578B	45	M5044	M5044	48
KU402	8503	8	M578B	M578B	45	M5048	M5048	46
L63	L63	20	M579	M579	46	M5051	M5051	45
L2060	BS502	40	M586	M586	45	M5052	M5052	45
L2061	BS510	40	M591B	BM1002	48	M5053	M5053	51
L2063	BS386	39	M595	M595B	45	M5054	M5054	51
L3219	M596	50	M595B	M595B	45	M5055	M5055	51
L4601*	M5176	48	M596	M596	50	M5057	M5057	51
L5047	RM117	50	M597	M597	48	M5058	M5125	44
L5191	RM103	50	M598B	M598B	48	M5059	M5059	51
LB6-10*	N1070	54	M599A	M599A	47	M5060	M5060	51
LD605	N1055	54	M599B	M599B	47	M5061	M5061	49
LI218	P874	67	M599F	M599F	47	M5062	M5062	49
	P875	67	M1222	4J34	45	M5063/2J70B	M5063/2J70B	45
LI221	7389C	67	M1224	4J32	45	M5064H	M5064H	47
LI222	7389C	67	M1225	4J31	45	M5065	M5065	47
LI223	7389C	67	M1226	4J31	45	M5067H	M5067H	48
M17-190W	M17-190W	73	M1302	M5020	45	M5068	M5068	48
M17-200BE	M17-200BE	73	M1304	M513B	48	M5075	M5075	49
M24-140GJ	M24-140GJ	73	M1305	M597	48	M5076	M5076	49
M28-232GH	M28-232GH	73	M1308	M503A	48	M5077	M5077	49
M28-233GH	M28-233GH	73	M1309	RM117	50	M5079A	M5079A	45
M32-100GJ	M32-100GJ	73	M1310	M5031	48	M5080	M5080	50
M38-122GH	M38-122GH	73	M1311	M5039	48	M5081	M5081	50
M38-180GJ	M38-180GJ	73	M1312	M598B	48	M5083	M5083A	45
M502	4J50A	50	M1315	M599A	47	M5083A	M5083A	45
M503A	M503A	48	M1315A	M599B	47	M5084	M5084	45
M504	M504	50	M1324	M5021	47	M5085	M5085	45
M506	M506A	49	M1325	M515	48	M5086	M5086	45
M506A	M506A	49	M4011	M4011	46	M5087	M5087	45
M513	M513A	48	M4016	M4016	44	M5089	M5089	49
M513A	M513A	48	M4017	M4017	46	M5091	M5091A	45
M513B	M513B	48	M4121	M4121	44	M5091A	M5091A	45
M515	M515	48	M4503B	BS914	33	M5094	M5094	45
M518A	4J31 to 4J35 and 4J53	45	M4505E	M5142	49	M5097	M5097	48
		45	M4527E	M5065	47	M5100	M5100	51
M521	M521	49	M4703B	BS196	33	M5103	M5125	44
M523	M523	50		BS206	34	M5105	M5105	49
M526	2J42	48	M5005	M5005	49	M5108	M5108	48
M529	M529	50	M5005A	M5005A	49	M5109/RM117	RM117	50
M536	4J43 and 4J44	45	M5008	M5032	46	M5110	M5125	44

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M5113	M5113	45	MA355A	MA355A	68	MT5557	5557	7
M5114B	M5114B	46	MA504A	MA504A	68	MT5559	BT5B	7
M5115	M5115	47	MA509A	MA509A	68	MX20	3069M	72
M5117 Series	M5117 Series	48	MA517A	MA517A	68	MXT92	BS192	33
M5123	M5123	51	MA522	MA522	24	MZ1/100	DA100	12
M5124	M5124	51	MA561A	MA561A	68	N1010A	N1010A	56
M5125	M5125	44	MA584A	MA584A	68	N1010S	N1010S	56
M5126A	M5126A	45	MA2851	RM103	50	N1022M	6861	52
M5127	M5127	51	MA2852	RM108	51	N1034A	N1034A	56
M5131	M5131	49	MA2855	RM101	44	N1034S	N1034S	56
M5133	M5133	46	MA2859	RM121	48	N1047M	N1047M	52
M5134	M5134	46	MA2862	RM112	51	N1055	N1055	54
M5135	M5135	46	MA2864	RM126	48	N1056	N1056	53
M5136	M5136	46	MA2865	RM127	46	N1061	N1061	55
M5137	M5137	51	MA2866	RM132	51	N1065	N1065	56
M5138/RM103	RM103	50	MA2867	RM128	48	N1067	BS386	39
M5142	M5142	49	MA3167A	BS452	33	N1070	N1070	54
M5145	M5145	45	MA3846X	BS830	35	N1071	N1071	55
M5149	M5149	49	MA3920X	BS206	34	N1072	N1072	54
M5154	M5154	51	MA3993	BS206	34	N1073	N1073	53
M5155	M5155	48	MA39016X	BS206	34	N1073Z	N1073Z	53
M5156	M5156	49	MAG3	2J42	48	N1074	N1073	53
M5157 Series	M5157 Series	50	MAG11	M506A	49	N1077	N1077	56
M5162	M5162	46	MAG12	MAG12	47	N1078	N1078	56
M5163	M5163	51	MAG15	MAG15	47	N1080A	N1080A	56
M5167	M5167	44	MAG16	M5022	49	N1081	N1081	56
M5168	M5168	51	MAG17	MAG17	47	N1082	N1082	56
M5169	M5169	45	MAG19	MAG19	50	N1083	N1083	56
M5170	M5170	46	MAG20	MAG20	47	N1085	N1072	54
M5171	M5171	51	MAG21A	MAG21A	47	N1089B	N1089B	56
M5172	M5172	48	MAG21B	MAG21B	47	N1094	N1094	54
M5173	M5173	48	MAG21C	MAG21C	47	N1095	N1095	55
M5174	M5174	48	MAG22	MAG22	47	N4004	N4004	52
M5175	M5175	48	MAG23A	MAG23A	47	N4041	N4041	52
M5176	M5176	48	MAG23B	MAG23B	47	N4074	N4074	53
M5178	M5178	49	MAG23C	MAG23C	47	N4075	N4075	53
M5182	M5182	47	MAG23D	MAG23D	47	N4085	N4085	54
M5187	M5187	49	MC567*	M554	45	N4094	N4094	54
M5191	M5191	49		M5169	45	N4115	N4115	55
M5193	M5193	44	MCF1145	M5080	50	N4132	N4132	54
M7050	P874	67	MCF1331*	M5169	45	N4134	N4134	55
	P875	67	MCV1352*	M5169	45	N4135	N4135	54
M7091S	P874	67	MCV1353*	M5169	45	N4136	N4136	53
	P875	67	MD80X54	BS206	34	N4173	N4173	52
M7092	P874	67	MD2901	BS452	33	N4178	N4178	52
	P875	67	MD5901	BS958	34	N4182	N4182	52
M8098	QS1212	21	ME1001	DET22	21	N4183	N4183	52
M8142	QS1213	21	ME1005	DET23	21	N4184	N4184	52
M8223	0A2WA	21	ME1101	2J42	48	N4184A	N4184A	52
MA52	MA52	24	ME1101D	M503A	48	N10003	N10003	54
MA54	MA54	24	ME1503	FX2505	8	N10004	N10004	53
MA100	MA100	25	ME1504	BT5B	7	N10007	N10007	54
MA100A	MA100A	25	ME1505	5557	7	N10011	N10011	54
MA125	MA125	24	MF31-55	MF31-55	72	N10012	N10012	55
MA126	MA126	24	MF41-10	MF41-10	72	N10016	N10016	56
MA164	MA164	24	ML857B*	AH205/857B	6	N10018	N10018	54
MA281	MA281	24	ML5894*	C178A/5894	16	N10019	N10019	54
MA282	MA282	27	ML6198	7735A	62	N10021	N10021	56
MA286	M5154	51	ML6421*	BR1124	13	N10022	N10022	55
MA287	BS952	34	MT17	5557	7	N10023	N10023	54
MA296	MA296	24	MT57	BT5B	7	N10500	N10500	55
MA338/7381	BS918	33	MT5544	BT125	7	N10501	N10501	55

* † Please refer to page 87.

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N10502	N10502	55	P807	P874	67	P8025 Series	P8025 Series	58
N10503	N10503	55	P807/E	P874	67	P8026 Series	P8026 Series	58
N10504	N10504	54	P810	7735A	62	P8030	P8030	61
NFT1	NFT1	85	P811	7295C	67	P8031	P8031	61
NFT2	NFT2	85	P811/E	7295C	67	P8034	P8034	62
NFT3	NFT3	85	P811G	P811G	67	P8034A	P8034A	61
NFT4	NFT4	85	P813	7038	62	P8037	P8037	63
NFT5	NFT5	85	P816*	P874	67	P8038	P8038	61
NFT6	NFT6	85		P875	67	P8038B	P8038B	61
NFT9	NFT9	85	P816/E*	P874	67	P8040	P8040	66
				P875	67			
NFT10	NFT10	85				P8041	P8041	66
NFT11	NFT11	85	P820	7038	62	P8064	P8064	65
NL715	5557	7	P822	7389C	67	P8065	P8065	65
NL734	BT125	7	P822/E	7389C	67	P8073	P8073	65
NL740*	BT125	7	P822G	P822G	67	P8076 Series	P8076 Series	65
NL760	BT127	7	P826	P826/4478	62	P8092	P8092	63
NL1009A	BK544	4	P826/4478	P826/4478	62	P8093	P8093	63
NL1022A	BK5822A	4	P831	P831	60	P8095	P8095	66
NL1036	BK476	4	P841	8507A	60	P8096	P8096	66
NL1037	BK7703	4	P841X	P841X	60	P8097	P8097	65
NL1039	BK7703	4	P842	8541A	61	P8122	P8122	64
NL1051A	BK448/5551A	4	P842X	P842X	61	P8123	P8123	60
NL1052A	BK484/5552A	4	P843	8572A	61	P8125	P8125	64
NL1053A	BK482	4	P844	P844	61	P8130 Series	P8130 Series	59
NL1059*	BK488	4	P846	8625	61	P8131 Series	P8131 Series	59
NL1059A*	BK488	4	P847	8626	61	P8132 Series	P8132 Series	59
NL1061	BK492/7669	4	P848	8507	60	P8133 Series	P8133 Series	59
NL1062	BK494/7671	4	P848D	P848D	61	P8135 Series	P8135 Series	59
NL1063	BK500	4	P849	8541	61	P8136 Series	P8136 Series	59
NL1081	BK502	4	P849D	P849D	61	P8137 Series	P8137 Series	59
NL1082	BK544	4	P851	P875	67	P8138 Series	P8138 Series	59
NL2408*	BK492/7669	4	P851/4415	P875	67	P8141 Series	P8141 Series	58
NL5550	BK66/5550	4	P855 Series	P855 Series	68	P8142 Series	P8142 Series	58
NL5553B	BK486/5553B	4	P856 Series	P856 Series	68	P8143 Series	P8143 Series	58
NL7171	BK476	4	P858	P858	67	P8144 Series	P8144 Series	58
NL7673	BK498/7673	4	P862*	P849D	61	P8145 Series	P8145 Series	58
NL7703	BK7703	4	P863	P863	60	P8146 Series	P8146 Series	58
NLC6J*	BT127	7	P872	P872	67	P8160 Series	P8160 Series	58
NLC6J-K*	BT127	7	P873	P873	67	P8161 Series	P8161 Series	58
NU829*	C178A/5894	16	P874	P874	67	P8201	P8201	60
NV1941	BS834	30	P875	P875	67	P8202	P8202	60
NV2441	BS838	30	P880	P880	66	P8203	P8203	61
NV2445	BS836	30	P882	P882	67	P8204	P8204	61
OA2	OA2	21	P883	P883	67	P8205	P8205	61
OA2WA	OA2WA	21	P887	P887	66	P8301B	P8301B	65
OG3	OS1209/5651	21	P893/4493	P893/4493	62	P8302	P8302	65
OS20F	P874	67	P894/4494	P894/4494	62	P8310	P8310	66
OS20H	P874	67	P895/4495	P895/4495	62	P8400 Series	P8400 Series	59
OS20M	P882	67	P4177	P4177	68	P8401 Series	P8401 Series	59
OS40F	P875	67	P4200	P4200	68	PL3C23A	BT143	7
OS40H	P875	67	P4217	P4217	68	PL4D21*	C1108	16
OS40M	P883	67	P8000 Series	P8000 Series	59	PL5C22/HT415	8503	8
P03-100RA	P03-100RA	74	P8001 Series	P8130 Series	59	PL5D22*	C1112	16
P08-100BE	P08-100BE	75		P8400 Series	59	PL17	5557	7
P08-100GJ	P08-100GJ	75	P8003 Series	P8132 Series	59	PL57	BT5B	7
				P8401 Series	59			
P08-100RA	P08-100RA	75				PL106	BT135	7
P08-100W	P08-100W	75	P8005 Series	P8131 Series	59	PL161	FX2501	8
P15-100BE	P15-100BE	75	P8008 Series	P8136 Series	59	PL165A	FX2505	8
P15-100GJ	P15-100GJ	75	P8018 Series	P8018 Series	60	PL174	6587	8
P15-100RA	P15-100RA	75	P8021 Series	P8021 Series	58	PL255	BT137	7
P15-100W	P15-100W	75	P8022 Series	P8022 Series	58	PL345	FX227	8
P535/1E*	C1150/1	16	P8023 Series	P8023 Series	58	PL435	FX2505	8
P552/1E*	C1150/1	16	P8024 Series	P8024 Series	58	PL522	8503	8

Type to be replaced	EEV/M-OV replacement	Page no	Type to be replaced	EEV/M-OV replacement	Page no	Type to be replaced	EEV/M-OV replacement	Page no
PL2052A	BK484/5552A	4	QV2-250B	4CX250B	17	RM176	RM176	51
PL5544	BT125	7	QV2-250C	4CX250B	17	RM177	RM177	51
PL5545	BT127	7	QV20-P18*	C1149/1	16	RM178	RM178	48
PL5551A	BK448/5551A	4	QV20-P18B*	C1149/1	16	RM181	RM181	47
PL5552A	BK484/5552A	4	QY3-125	C1108	16	RR3-250	GXU1	6
PL5553B	BK486/5553B	4	QY4-250	C1112	16	RR3-1250	GXU2	6
PL5555	BK46/5555	4	QY4-400	C1136	16	RR3-1250A	GXU3	6
PL5557	5557	7	QY5-3000A	ACS4	17	RR3-1250B	GXU4	6
PL5559	BT5B	7	R06-100GR	R06-100GR	76	RS520*	BW1124	14
PL5632/C3J	ZT1011	7	R13-660BE	R13-660BE	76	RS526	BW1161	14
PL5684	ZT1011	7	R22-110BH	R22-110BH	76	RS635*	B1153	12
PL5822A	BK5822A	4	R23-120BE	R23-120BE	76	RS683*	C1108	16
PL6755A	BT145	7	R1130B	1B59	70	RS685*	C1108	16
PMC5	PMC5	54	R1169	XL601	70	RS686*	C1136	16
PMC14	PMC14	54	RC1	RC1	82	RS726*	BR1161	13
PMDM2	BS514	40	RCY	RCY	82	RS822*	BY189A	15
PMDM2B	BS524	40	RE125C*	C1108	16		BY1102	15
PMDM3	BS512	40	RE400C*	C1136	16	RS826	BY1161	15
PMDM10	BS516	40	RG3-250A	GU12	6	RS833*	BY1122	15
PMDM11	BS528	40	RG3-1250	AH238	6	RS1001L*	BR1122	13
PMDU7	BS600	40	RG4-1000	AH2532A	6	RS1002A	C1136	16
Q160-1*	C1108	16	RG4-1250	AH221	6	RS1007*	C1108	16
Q400-1*	C1112	16	RG4-3000	AH2511	6	RS1009*	C178A/5894	16
Q450-1*	C1136	16		BD510	6	RS1019*	C1134	16
QB3/300	C1108	16	RK4D32	4D32	16	RS1036	B1152	12
QB3.5/750	C1112	16	RL16	RL16	80	RS1046	B1153	12
QB4-1100	C1136	16	RL17	5557	7	RS2002V	CY1172	18
QBL5-3500	ACS4	17	RL57	BT5B	7	RS2016	4CX5000A	17
QEL1/150	4CX250B	17	RM101	RM101	44	RS2793	4CX5000A	17
QF34	BS894	31	RM101/MA2855	RM101	44	RS2794*	4CX10,000D	17
QF37	BS894	31	RM103	RM103	50	RS4791	4CX1000A	17
QF38*	BS994	31	RM103/MA2851	RM103	50	RW80	N10504	54
QF41	BS810	33	RM104	RM104	44	S1200	P8125B	64
QF41M	BS462	33	RM106	RM106	51	S1201	P8125A	64
QF45	BS810	33	RM107	RM107	48	S1202	P8125	64
QF401	BS888	36	RM108	RM108	51	S7003	P8064	65
QF451	BS810	33	RM108/MA2852	RM108	51	SAS*	BK472	4
QF451L	BS908	35	RM110	RM110	51	SC1 Series	SC1 Series	22
QF451LA*	BS908	35	RM112	RM112	51	SC2 Series	SC2 Series	22
QF451M	BS462	33	RM112/MA2862	RM112	51	SC3 Series	SC3 Series	22
QF451P	BS822	33	RM117	RM117	50	SC5 Series	SC5 Series	22
QKH1535	M5039	48	RM121	RM121	48	SC6 Series	SC6 Series	22
QKH1862	M5039	48	RM121/MA2859	RM121	48	SC7 Series	SC7 Series	22
QKH1978	M5063/2J70B	45	RM126	RM126	48	SC7/E Series	SC7/E Series	22
QKH2001	M5063/2J70B	45	RM126/MA2864	RM126	48	SD6000	SD6000	83
QQE03/20	C1134	16	RM127	RM127	46	SD15000	SD15000	83
QQE06/40	C178A/5894	16	RM127/MA2865	RM127	46	SD15000A	SD15000A	83
QQV03-20A	C1134	16	RM128	RM128	48	SE4/2B/P31	1074H	75
QQV03-20B	C1534	16	RM128/MA2867	RM128	48	SE5/2A/P31	1324M	75
QQV06-40A	C178A/5894	16	RM130	RM130	50	SEC*	BK496	4
QS75/20	QS75/20	21	RM132	RM132	51	SGR1	FX2505	8
QS83/3	QS1209/5651	21	RM132/MA2866	RM132	51	SMS6	SMS6	53
QS150/15	QS150/15	21	RM136	RM136	50	SMS7	SMS7	53
QS1200	QS1200	21	RM137	RM137	49	SMX16	SMX16	55
QS1207	0A2	21	RM142	RM142	48	SRS455	C1108	16
QS1209	QS1209/5651	21	RM143	RM143	51	SRS456	C1136	16
QS1209/5651	QS1209/5651	21	RM146	RM146	48	SRS4451*	C178A/5894	16
QS1210	0A2WA	21	RM152	RM152	51	SRS4452	C1134	16
QS1212	QS1212	21	RM157	RM157	44	SRU4438	K3080	41
QS1213	QS1213	21	RM160	RM160	46	SRV355*	BY1161	15
QS1215	QS1215	21	RM168	RM168	48	Ste1000/2.5/10	BT5B	7
QSC5	QSC5	22	RM174	RM174	44	Ste1000/2.5/15	BT5B	7
QV1-150A	4CX250B	17	RM174A	RM174A	44	Ste15000/15/45	BT69	7

* † Please refer to page 87.

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Ste2000/6/80	BT127	7	TH3084	M5170	46	TQ2/12	BT153	7
Ste2500/05/2	5557	7	TH3085	M5162	46	TQ2/61	BT127	7
StR85/10*	QS1209/5651	21	TH5021B	GU12	6	TQ4	BT147A	7
StR150/30*	0A2	21	TH5221B	GXU1	6	TQ5/3	BT145B	7
STV85/10	QS1209/5651	21	TH5586	5586	46	TQ5/6	BT127A	7
STV150/30	0A2	21	TH5657	5657	46	TQ41	BT149	7
SZ50	K351	41	TH6011	5557	7	TQ41C	BT149A	7
SZ52A	K3079	41	TH6031	BT5B	7	TQ51	BT147	7
SZ53	K351	41	TH6120*	BT17	7	TQ55	BT95B	7
T149*	BT17	7	TH6220	BT127	7	TQ71	BT141A	7
T357	BS452	33	TH6220A	BT127	7	TRN1	BS702	30
T924Z	MF31-55	72	TH6334	BS320	33	TRN2	BS710	30
T940B	T940B	75	TH6435	FX2505	8	TRN3	BS710	30
T940G	T940G	75	TH6522	8503	8	TRP3	BS716	30
T940R	T940R	75	TH7010	BK66/5550	4	TRP4	BS718	30
T940W	T940W	75	TH7020	BK448/5551A	4	TRP5	BS720	30
T957Y	T957Y	72	TH7021*	BK448/5551A	4	TRP8	BS724 Series	30
T957Y/TPD	T957Y/TPD	72	TH7023	BK448/5551A	4	TRP10	BS732	30
T957Z	T957Z	72	TH7030	BK484/5552A	4	TRP14	BS714	30
T957Z/TPD	T957Z/TPD	72	TH7031*	BK484/5552A	4	TRW1	BS800	31
T958Z/TPD	T958Z/TPD	72	TH7033	BK484/5552A	4	TT16D	C1108	16
T963Z	T963Z	72	TH7036	BK544	4	TT17	5557	7
T964Y	F21-10LD	72	TH7037	BK484/5552A	4	TT20	C1134	16
T965Z*	3069R	72	TH7040	BK486/5553B	4	TT21	TT21	16
T974Z*	3069R	72	TH7041*	BK486/5553B	4	TT22	TT22	16
T977Z*	T989Z	72	TH7043	BK486/5553B	4	TT25*	C178A/5894	16
T983S	T983S	72	TH7047	BK486/5553B	4	TT100	TT100	16
T983Z	T983Z	72	TH7050	BK7703	4	TTR31MR	BS822	33
T988S	T988S	72	TH7051	BK7703	4	TV1542	M5125X	†
T988Z	T988Z	72	TH9700	P875	67	TV2255	P8031	61
T989S	T989S	72	TH9701	P874	67	TV2350*	K3071	41
T989Z	T989Z	72	TH9801	P849D	61	TV8000	8541A	61
T9017W	T9017W	72	TH9804	7038	62	TV8800	P8037	63
TA3095*	M5169	45	TH9806PA	8541	61	TV9300	P844	61
TB3/750*	DET40	21	TH9807PA	P844	61	TVG1	TVG1	83
TB4/1500	B1152	12		8541A	61	TWC5 Series	TWC5 Series	54
TB5/2500	B1153	12	TH9808PA	P849D	61	TWC14 Series	TWC14 Series	54
TBH7/8000	BW1162J3	14	TH9810	P849D	61	TWC18	TWC18	52
TBL6/6000	BR1165	13	TH9812PA	P842X	61	TWC35	N10018/1	54
TBL6/6000B	BR1160	13	TH9813	8134V1/4811	62	TWC35B	N10018/3	54
TBL7/8000	BR1162	13	TH9814PA	P831	60	TWC35C	N10018/2	54
TBL7/9000*	BR1196	13	TH9815PA	P842X	61	TWC37	N10019/1	54
TBW6/6000	BW1165	14	TH9817PA	8626	61	TWC37B	N10019/3	54
TBW7/8000	BW1162	14	TH9818PA	P842X	61	TWC37C	N10019/2	54
TD03/10	DET22	21	TH9820	P8125 Series	64	TWJ30	TWJ30	52
TD03/10D	DET22D	21	TH9826*	P8201	60	TWS6	TWS6	53
TD03/10E	DET22E	21	TH9827*	P8202	60	TWS7	TWS7	53
TD04/20	DET24	21	TH9830	8521	63	TWS10/7642	TWS10/7642	53
TD25	C178A/5894	16	TH9831*	8480V1/4810	63	TWS12	TWS12	53
TD1306-001	8541A	61	TH9832	8521	63	TWS17	TWS17	52
TD1306-047	P8125 Series	64	TH9833	P8031	61	TWS36	TWS36	53
TD1319	8541A	61	TH9834	P8201	60	TWX8	TWX8	55
TG200	FX2505	8	TH9839	P8202	60	TWX16	TWX16	55
TG1000	8503	8	TH9844	P8201	60	TWX19	TWX19	52
TGL9477	C1108	16	TH9855	P8093	63	TWX22	TWX22	55
TGL9481	C1134	16	THX840	P8092	63	TWX34	TWX34	55
TGL9482	C178A/5894	16	TL368	BS206	34	TX920	BT5B	7
TH3B24W	3B24W	5	TL6011	ZT1011	7	TY5-500	B1152	12
TH4J50A	4J50A	50	TQ1/2*	ZT1011	7	TY6-800	B1153	12
TH4J52A	4J52A	50	TQ2*	5557	7	TY6-3000A	BR1126	13
TH1586	5586	46	TQ2/3	BT125	7	TY6-5000A	BR1165	13
TH1657	5657	46		BT145A	7	TY6-5000B	BR1160	13
TH3060B*	M5125	44	TQ2/6*	BT127	7	TY6-5000W	BW1165	14

* † Please refer to page 87.

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TY7-6000A	BR1162	13	U2000/3A	U2000/3/40A	25	UCSXF750	U750/10/75J	24
TY7-6000H	BW1162J3	14	U2000/3/40	U2000/3/40	25	UCSXF1000	U1000A/10/75J	25
TY7-6000W	BW1162	14	U2000/3/40A	U2000/3/40A	25	UCSXF1200	U1200/10/75J	25
TY8-6000A*	BR1196	13	U2000/3/40B	U2000/3/40B	25	UCSXF1500*	U1500/8/75	25
U6/15/7F	UF6/15/7	27	U2000/3/40C	U2000/3/40C	25	UCSXF2000	U2000/8/75J	25
							U2000/8/75JA	25
U10/15/7F	UF10/15/7J	27	U2000/3P	U2000/3/40B	25			
U19	U19	5	U2000/8/75J	U2000/8/75J	25	UCW650/30/500	UCW650/30/500	27
U23	U19	5	U2000/8/75JA	U2000/8/75JA	25	UCW1000/30/500	UCW1000/30/500	27
U30/15	U30/15/20	24	U2100/8/75	U2100/8/75	25	UCW1200/20/500	UCW1200/20/500	27
U30/15/20	U30/15/20	24	U3000/3/40J	U3000/3/40J	25	UD100/20/40	U100/20/40	24
U50/15	U50/15/30	24	U3000/3/40JA	U3000/3/40JA	25	UE966	GU12	6
U50/15/30	U50/15/30	24	UA025A	GXU1	6	UE967	5557	7
U50/20/40	U50/20/40	24	UA75/15/40	U75/15/40	24	UF6/15/7	UF6/15/7	27
U60/30/75	U60/30/75	24	UA200/10/40	U200/10/40	24	UF10/15/7J	UF10/15/7J	27
U75/15/40	U75/15/40	24	UA300/10/40	U300/10/40	24	UF12/20/40	UF12/20/40	27
U80/15	U80/15/40	24	UB50/20/40	U50/20/40	24	UF25/10/40	UF25/10/40	27
U80/15/40	U80/15/40	24	UB150/15/40	U150/15/40	24	UF25/20/40	UF25/20/40	27
U90/15/40	U90/15/40	24	UB400/10/40	U400/10/40	24	UF50/10/40	UF50/10/40	27
U100/20/40	U100/20/40	24	UB400/10/40A	U400/10/40A	24	UF50/20/40	UF50/20/40	27
U100/25/75	U100/25/75	24	UC250/20/125	UC250/20/125	26	UF75/10/40	UF75/10/40	27
U150/15/40	U150/15/40	24	UC250/25/125J	UC250/25/125J	26	UF100/10/40	UF100/10/40	27
U150/25/75	U150/25/75	24	UC250/30/150J	UC250/30/150J	26	UF150/10/40	UF150/10/40	27
U200/10/40	U200/10/40	24	UC250/30/150JA	UC250/30/150JA	26	UF250/8/40	UF250/8/40	27
U200/15/40	U200/15/40	24	UC250/30/150JD	UC250/30/150JD	26	UF300/10/50	UF300/10/50	27
U200/15/40A	U200/15/40A	24	UC300/10/70J	UC300/10/70J	26	UF300/15/75	UF300/15/75	27
U200/20/75	U200/20/75	24	UC450/25/125J	UC450/25/125J	26	UD200/15/40	U200/15/40	24
U250/15/75J	U250/15/75J	24	UC450/30/150J	UC450/30/150J	26	UD500/10/40	U500/10/40	24
U300/10/40	U300/10/40	24	UC450A/30/150	UC450A/30/150	26	UD500/10/40A	U500/10/40A	24
U300/15/40	U300/15/40	24	UC650/30/150J	UC650/30/150J	26	UE300/15/40	U300/15/40	24
U300/20/75	U300/20/75	24	UC750/20/150J	UC750/20/150J	26	UE750/10/40	U750/10/40	24
U300/20/75A	U300/20/75A	24	UC750/20/150JA	UC750/20/150JA	26	UF500/10/50	UF500/10/50	27
U400/10/40	U400/10/40	24	UC1000/8/125J	UC1000/8/125J	26	UF750/8/75	UF750/8/75	27
U400/10/40A	U400/10/40A	24	UC1000/10/125J	UC1000/10/125J	26	UF1000/8/75	UF1000/8/75	27
U500/3/40J	U500/3/40J	24	UC1000/15/125	UC1000/15/125	26	UFC6/30/140J	UFC6/30/140J	28
U500/5/40J	U500/5/40J	24	UC1000/20/150J	UC1000/20/150J	26	UFC12/30/140J	UFC12/30/140J	28
U500/10/40	U500/10/40	24	UC1000/20/150JA	UC1000/20/150JA	26	UFC12/32/100	UFC12/32/100	28
U500/10/40A	U500/10/40A	24	UC1000/30/150J	UC1000/30/150J	26	UFC16/32/100	UFC16/32/100	28
U500/15/75	U500/15/75	24	UC1000A/20/150	UC1000A/20/150	26	UFC18/30/140J	UFC18/30/140J	28
U500/15/75A	U500/15/75A	24	UC1500/8/125J	UC1500/8/125J	26	UFC25/30/140J	UFC25/30/140J	28
U500A/10/40J	U500A/10/40J	24	UC1500/10/125J	UC1500/10/125J	26	UFC25/32/100	UFC25/32/100	28
U500A/15/75J	U500A/15/75J	24	UC1500/20/150J	UC1500/20/150J	26	UFC34/30/140J	UFC34/30/140J	28
U600/8/40	U600/8/40	24	UC2000/20/150J	UC2000/20/150J	26	UFC40/30/140J	UFC40/30/140J	28
U650/3/40	U650/3/40	24	UC2300/8/125J	UC2300/8/125J	26	UFC43/30/140J	UFC43/30/140J	28
U650/3/40A	U650/3/40A	24	UC2300/8/125JB	UC2300/8/125JB	26	UFC50/30/140J	UFC50/30/140J	28
U750/10/40	U750/10/40	24	UC2300/10/125J	UC2300/10/125J	26	UFC50/32/100	UFC50/32/100	28
U750/10/40A	U750/10/40A	24	UC2500/5/60J	UC2500/5/60J	26	UFC76/30/120J	UFC76/30/120J	28
U750/10/75J	U750/10/75J	24	UCM500/5/25	UCM500/5/25	26	UFC100/15/80	UFC100/15/80	28
U750/15/75	U750/15/75	24	UCM500A/5/25	UCM500A/5/25	26	UFC100/15/140	UFC100/15/140	28
U1000/3	U1000/3/40	24	UCM2000/5/40	UCM2000/5/40	26	UFC100/24/100	UFC100/24/100	28
U1000/3/40	U1000/3/40	24	UCM2000A/5/40	UCM2000A/5/40	26	UFC100/30/120J	UFC100/30/120J	28
U1000/3/40A	U1000/3/40A	24	UCS5-200*	U200/10/40	24	UFC150/15/140	UFC150/15/140	28
U1000/3/40C	U1000/3/40C	25		U200/15/40	24	UFC450/12/125J	UFC450/12/125J	28
U1000/3M	U1000/3/40A	24	UCS10-300*	U300/10/40	24	UFC450/15/125J	UFC450/15/125J	28
U1000/10/75J	U1000/10/75J	25		U300/15/40	24	UFC450/30/200J	UFC450/30/200J	28
U1000A/3/40JB	U1000A/3/40JB	25	UCS10-400	U400/10/40	24	UFC500/12/125J	UFC500/12/125J	28
U1000A/3/40JD	U1000A/3/40JD	25	UCSF500	U500A/10/40J	24	UFC500/15/125J	UFC500/15/125J	28
U1000A/10/75J	U1000A/10/75J	25	UCSL1000	U1000A/3/40JB	25	UFC700/15/125	UFC700/15/125	28
U1000B/10/75	U1000B/10/75	25		U1000A/3/40JD	25	UFC750/15/125	UFC750/15/125	28
U1200/10/75J	U1200/10/75J	25	UCSL2000	U2000/3/40	25	UFC1000/15/125	UFC1000/15/125	28
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U2000/2P	U2000/3/40B	25	UCSX700*	U750/10/40	24	UFC1000A/12/125J	UFC1000A/12/	
U2000/3	U2000/3/40	25	UCSX1000	U1000/10/75J	25		125J	28

* † Please refer to page 87.

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UFC1500/20/200	UFC1500/20/200	28	VVC400-42-7.5*	U400/10/40	24	WT210-0285	BK494/7671	4
UFC2000/20/200J	UFC2000/20/200J	28	VVC500-42-10*	U500/10/40	24	WT210-0290	BK492/7669	4
UG60/30/75	U60/30/75	24	VX580A	GXU1	6	WT210-0306	BK482	4
UG100/25/75	U100/25/75	24	W5M/1A	N10018 Series	54	WT262	GU12	6
UG200/20/75	U200/20/75	24	W5MC/1A	N10019 Series	54	WTT111	BT5B	7
UG500/15/75	U500/15/75	24	WF42	BS200	33	WTT117	5557	7
UG1000/10/75	U1000B/10/75	25	WF43	BS202	33	X-6.25	UF6/15/7	27
UH150/25/75	U150/25/75	24	WF45	BS914	33	X-10	UF10/15/7J	27
UH300/20/75	U300/20/75	24	WF49A	BS194	32	XA1	XA1	82
UH750/15/75	U750/15/75	24	WF402	BS158	33	XE1-3	XL615/4/3	†
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UJ1000/3B	U1000A/3/40JB	25	WF403	BS156	33	XG2-12*	BT29	7
UJA500/5	U500/5/40J	24	WF404L	BS814	35	XG2-500	BT19	7
UJB3000/3	U3000/3/40J	25	WF405L	BS818	35	XG2-6400*	BT17	7
UKC450/30/150	UC450/30/150J	26	WF407L	BS814	35	XG5-500	5557	7
USL500	U500/5/40J	24	WF409	BS452	33	XG15-12	BT69	7
UXCF250	U250/15/75J	24	WF412L	BS826	35	XH3-045	FX227	8
UXCF500	U500A/15/75J	24	WF415	BS440	33	XH8-100	FX2505	8
VA201B	K351	41	WF416	BS450	33	XH16-200	8503	8
VA203B/6975	K3078/6975	41	WJ367	N10007	54	XH25-500	FX2519A/5949A	8
VA210P	K3073	41	WL5D22*	C1112	16	XL601	XL601	70
VA218B	K3069	41	WL575A*	AH2511	6	XL603	XL603	70
VA508	K3071	41	WL624*	BT17	7	XL604	XL615/10/5.5	†
VCCA12	UF12/20/40	27	WL632B*	BT5B	7	XL605	XL615/10/6.5	†
VCCA25	UF25/20/40	27	WL651	BK484/5552A	4	XL606	XL615/13/6.5	†
VCCA50	UF50/20/40	27	WL652	BK448/5551A	4	XL608	XL615/9/4	†
VDX1014	BS952	34	WL655	BK486/5553B	4	XL611	XL615/7/3	†
VDX1047	BS206	34	WL656	BK484/5552A	4	XL615 Series	XL615 Series	†
VDX1047S	BS206	34	WL657	BK448/5551A	4	XL627	XL627	70
VDX1138	BS958	34	WL658	BK486/5553B	4	XL631	XL631	70
VDX1161*	BS219	34	WL681	BK66/5550	4	XL632	XL632	†
VE966A	GU12	6	WL857B*	AH205/857B	6	XL635	XL635	70
VH550A	GU12	6	WL866A	GU12	6	XL639 Series	XL639 Series	†
VMMHC250*	UC250/30/150JA	26	WL5550	BK66/5550	4	XL641	XL641	70
	UC250/30/150JD	26	WL5551A	BK448/5551A	4	XQ1003*	P849D	61
VMMHC450*	UC450A/30/150	26	WL5552A	BK484/5552A	4	XQ1004*	8541	61
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VMX-1027	RM103	50	WL5559	BT5B	7	XQ1005X	8541AX	61
VOS20K	P874	67	WL5822A	BK5822A	4	XQ1007	P849D	61
VOS20M	P882	67	WL7669	BK492/7669	4	XQ1008	8541	61
VOS25H	7389C	67	WL7671	BK494/7671	4	XQ1020 Series	P8130 Series	59
VOS25M	P872	67	WL7673	BK498/7673	4		P8400 Series	59
VOS40K	P875	67	WL7681	BK544	4	XQ1021 Series	P8130 IG Series	59
VOS40M	P883	67	WT210-0008	GU12	6		P8400 IG Series	59
VOS50H	7295C	67	WT210-0051	0A2	21	XQ1022	P8130X	59
VOS50M	P873	67	WT210-0056	BT5B	7		P8400X	59
VQ1	VQ1	85	WT210-0070	BK66/5550	4	XQ1023	P8132AR	59
VQ2	VQ2	85	WT210-0071	BK448/5551A	4		P8401AR	59
VQ3	VQ3	85	WT210-0072	BK484/5552A	4	XQ1024	P8132AR IG	59
VQ4	VQ4	85	WT210-0073	BK486/5553B	4		P8401AR IG	59
VQ6	VQ6	85	WT210-0147	BK484/5552A	4	XQ1025	P8132RF	59
VQ9	VQ9	85	WT210-0149	BK448/5551A	4		P8401RF	59
VQ10	VQ10	85	WT210-0152	BK486/5553B	4	XQ1026	P8132RF IG	59
VT46	GU12	6	WT210-0158	BK448/5551A	4		P8401RF IG	59
VT46A	GU12	6	WT210-0159	BK484/5552A	4	XQ1030*	7262A	62
VT123	5586	46	WT210-0165	BK486/5553B	4	XQ1031*	7262A	62
VVC50-42-20*	U50/20/40	24	WT210-0170	BK5822A	4	XQ1032*	7262A	62
VVC100-42-20*	U100/20/40	24	WT210-0246	BK544	4	XQ1040	P844	61
VVC200-42-7.5	U200/10/40	24	WT210-0249	BK448/5551A	4	XQ1041	P842X	61
VVC200-42-15*	U200/15/40	24	WT210-0252	BK484/5552A	4	XQ1042	8541A	61
VVC300-42-7.5*	U300/10/40	24	WT210-0274	BK492/7669	4	XQ1043	8541	61
			WT210-0275	BK494/7671	4	XQ1044	P849D	61

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XQ1052*	8507A	60	XQ1295	P844	61	YD1212	BW1185J2	14
XQ1053	P8031	61	XQ1296	P849F	61	YD1230	BR1126	13
XQ1054	P8031	61	XQ1297	P849F	61	YD1240	BR1512	13
XQ1060*	P842X	61	XQ1311	P8037	63	YD1244	BR1512A	13
XQ1061*	8541A	61	XQ1400	P8125B	64	YD1400	YD1400	20
XQ1062	P8031	61	XQ1401	P8125B	64	YD1420	YD1420	13
XQ1063	P8031	61	XQ1402	P8125	64	YJ1040*	8356	48
XQ1064	P8031	61	XQ1410 (fixed bias)	P8130H Series	59	YJ1060	6027H	48
XQ1065*	P844	61	Series	P8400H Series	59	YJ1070	M537A	48
XQ1066	P8031F	61	XQ1410 (variable bias)*			YJ1071	M597	48
XQ1067	P8031F	61		P8131H	59	YJ1110	M513B	48
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XQ1070/02	P8141	58		P8401AR	59	YJ1112	M5025	48
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XQ1073/02	P8143AR	58		P8401RF	59	YJ1123	M5089	49
XQ1074	P8023AR IG	58	XQ1415 (variable bias)*	P8133RF	59	YJ1124	M5068	48
XQ1075	P8023RF	58				YJ1200	M5005	49
XQ1075/02	P8143RF	58	XQ1427	P8160	58	YJ1250	M5042S	50
XQ1076	P8023RF IG	58	XQ1428	P8161	58	YJ1300	M5043	48
XQ1080	P8145	58	XQ1500	P8145	58	YJ1390	M5021	47
XQ1081	P8145 IG	58	XQ1503	P8145AR	58	YK1000*	K365	42
XQ1083	P8146AR	58	XQ1505	P8145RF	58	YK1040*	K351	41
XQ1084	P8146AR IG	58	XQ1520 (fixed bias)	P8136	59	YK1046*	K391	41
XQ1085	P8146RF	58	XQ1520 (variable bias)*	P8135	59	YL1091	CY1172	18
XQ1086	P8146RF IG	58				YL1430	CR1501	17
XQ1090	P8025	58	XQ1525 (fixed bias)	P8138RF	59	YL1440	CR1502	17
XQ1091	P8025 IG	58	XQ1525 (variable bias)*	P8137RF	59	YL1460	C1136	16
XQ1093	P8026AR	58				YL1550	YL1550	16
XQ1094	P8026AR IG	58	XR1-1600A	ZT1011	7	ZT1000	BT139	7
XQ1095	P8026RF	58	XR1-3200	BT125	7	ZT1011	ZT1011	7
XQ1096	P8026RF IG	58	XR1-3200A	BT125	7	ZX1051	BK448/5551A	4
XQ1120*	8134V1/4811	62	XR1-6400	BT127	7	ZX1052	BK484/5552A	4
XQ1121*	8134	62	XR1-6400A	BT127	7	ZX1053	BK486/5553B	4
XQ1160*	P831	60	XX1063	P8076A	65	ZX1061	BK502	4
XQ1161*	P831	60	YD1120	BR1160	13	ZX1062	BK544	4
XQ1180*	P8034A	61	YD1150	BR1195	13	ZX1063	BK482	4
XQ1181*	P8034A	61	YD1151	BW1195	14	ZX1081	BK492/7669	4
XQ1200	P8125 Series	64	YD1152	BW1195J3	14	ZX1082	BK494/7671	4
XQ1240	P8038	61	YD1160	BR1196	13	ZY1000	BD512A	6
	8541A	61	YD1161	BW1196	14	ZY1001	BD512B	6
XQ1241	P849D	61	YD1162	BW1196J3	14	ZY1002	BD512C	6
XQ1271	P8037	63	YD1170*	BR1513	13	И1-100/1.5	BK504/5554	4
XQ1280	P842X	61	YD1171*	BW1513J2	14	И1-200/1.5	BK46/5555	4
XQ1285	P842F	61	YD1172*	BW1513J2	14	И1-70/0.8	BK502	4
XQ1290	P842X	61	YD1175*	BR1513	13	И1-140/0.8	BK484/5552A	4
XQ1291	8541A	61	YD1177*	BW1513J2	14	И1-350/0.8	BK486/5553B	4
XQ1292	8541	61	YD1185*	BR1182	13	ГМИ-83*	C1150/1	16
XQ1293	P849D	61	YD1187*	BW1182J2	14			

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Poland	F.A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Badstrasse 4 $\frac{1}{3}$, German Federal Republic Tel: (08041) 8576 Telex: Fab d 526246 Cables: Hankobern Bad Toelz
Portugal	MEDITROM - Commercial de Equipamentos Técnicos S.A.R.L., Avenida 5 de Outubro 89, Lisbon 1. Tel: 76 21 89 Telex: 13 653 Rovex R Portugal Cables: Meditrom Lisbon
Rumania	F.A. Bernhardt G.m.b.H., D8170 Bad Toelz, Badstrasse 4 $\frac{1}{3}$, German Federal Republic. Tel: (08041) 8576 Telex: Fab d 526246 Cables: Hankobern Bad Toelz
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 Cables: Gecingap Singapore
Somalia	Richmond Electronics (Markyate) Ltd., Hicks Road, Markyate, Herts. AL3 8LQ. Tel: Luton (0582) 840761 Telex: Duneng G 826383
South Africa (also Botswana, Lesotho Mozambique, Swaziland)	Marconi (South Africa) Ltd., P.O. Box 14289, Wadestown 1422. Tel: 34-5903/9 Telex: 86003 M-OV Telephone line arresters only: GEC Power Distribution (Pty) Ltd., Magnet Road, Knights, Transvaal. Tel: 826-3536 Telex: 8-3512 SA
Spain	Eurotronica SA, D. Ramon de la Cruz 90, Madrid 6. Tel: 401 52 00 Telex: 27284 EUROT E Cables: Eurotronica Madrid
Sudan	North Nile Commercial Agencies Ltd., P.O. Box 2635, Khartoum. Tel: 73655, 79751 Telex: 468
Sweden	SRA Communications AB, Agencies Division, Fack-S-163 00 Spanga. Tel: (46-8) 752 10 00 Telex: 13545A Cables: Svenskradio Stockholm
Switzerland	Erno Electronic AG, Niederhaslistrasse 12, CH-8157 Dielsdorf. Tel: 01-853 22 42 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 Damascus. Cables: Attarco Damascus.
Taiwan	Hongkong Trading Co. Ltd., P.O. Box 724, Taipei, Taiwan. Tel: 771-9473, 771-9704 Telex: 11017 Protexol. Cables: Protexol Taipei
Thailand	Siam Teltech Co. Ltd., 29/3 Saladaeng Road, Soi 1, Bangkok, P.O. Box 2718. Tel: 2350515 Telex: TH2631 Cables: Siteco Bangkok
Trinidad & Tobago and Guyana	CARTEL - Caribbean Telecoms Ltd., Post Bag 732, Port-of-Spain, Trinidad W.I. Tel: 62-37727, 62-38122 Cables: Cartel Port-of-Spain
Turkey	Ratel Radyo Telekomünikasyon Limited Sirketi, Okcu Musa Caddesi, Bankalar Sarayı Kat 3, Karaköy, Istanbul. Tel: 010-90-11-45 50 05/6 Telex: 24285 RTLC TR Cables: Ratelcom Istanbul
United States of America	EEV Inc., 7 Westchester Plaza, Elmsford, N.Y. 10523. Tel: 914 592 6050 Telex: 710 567 1215
Uruguay	Pellmar S.A., Piedras 676-77, Montevideo. Tel: 8-14-47 Cables: Pellicersa Montevideo
Venezuela	Marconi de Venezuela C.A., Apartado 3923, Caracas, Postal Zone 101. Tel: 572 5411 Telex: 22856 Cables: Enelectico Caracas
Yugoslavia	F.A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Badstrasse 4 $\frac{1}{3}$, German Federal Republic. Tel: (08041) 8576 Telex: Fab d 526246 Cables: Hankobern Bad Toelz
Zambia	M-OV Products: GEC-AEI Zambia Ltd., Third Street, P.O. Box 1890, Ndola. Tel: 4251 Telex: ZA3376

Ghana	Benarvey Agencies Ltd., P.O. Box 2466, Accra.
Greece	Telmaco Ltd., 8 Sekeri Street, Athens 138. Tel: 3608 443-6 Telex: 21-9185 Cables: Teltramaco
Hong Kong, Macao	Cable and Wireless Systems Ltd., GPO Box 4477, Mercury House, Connaught Road, Hong Kong. Tel: 5-2831385 Telex: HX 74000 Cables: Cwsystems
Hungary	F.A. Bernhardt G.m.b.H., D-8170 Bad Toelz, Badstrasse 4 $\frac{1}{3}$, German Federal Republic. Tel: (08041) 8576 Telex: Fab d 526246 Cables: Hankobern Bad Toelz
Iceland	Orka Ltd., P.O. Box 360, Laugavegur 178, Reykjavik. Tel: 38000 Telex: 2095 Cables: Power Reykjavik
India	Aimil Sales and Agencies Private Ltd., B5 Gillander House, P.O. Box 440, Calcutta 700 001. Tel: 223304 Telex: 021 7731 Cables: Aimil India House, Post Box 119, Walchand Hirachand Marg, Bombay 400 001. Tel: 265654 Telex: 011 2931 Cables: Aimilbom Sunlight Insurance Building, 26-27 Asaf Ali Road, New Delhi 110 001. Tel: 273611 Telex: 031 2700 Cables: Aimildel No. 2 III Main Road, Nehru Nager, Post box 928, Adyar, Madras 600 020. Tel: 412409
Indonesia	P. T. Taju Puspa Overseas Ltd., Cilandak Commercial Estate, P.O. Box 193/Kbyt, Jakarta, Selatan. Tel: 777052, 760546, 760702 Telex: 47279 TPO 1A Cables: Tajupuspa - KBY
Italy	Marconi Italiana S.P.A., Via A. Negrone 1A, 16153 Genova Cornigliano. Tel: 4108 Telex: 270386 Marconi Genoa Cables: Expanse Cornigliano-Ligure Via Adige 39, 00198 Rome. Tel: 85 30 41 Telex: 610272 Marconi Rome Cables: Expanse Rome Via Palmanova 185, 20132 Milan. Tel: (02) 25 63 141, 25 67 741 Telex: 311467 Marconi Milan Cables: Expanse Milan
Japan	Cornes and Co. Ltd., C.P.O. Box 158, Tokyo 100-91. Tel: 272-57771 Telex: J24874 Cables: Cornes Tokyo Marden House, C.P.O. Box 329, Osaka 530-91. Tel: (532) 1012/1019 Telex: 525-4496 Corosa J. Cables: Cornes Osaka
Jordan	Consult-Tel, P.O. Box 35055, Amman. Tel: 42333 Telex: 1593 CITHTL JO
Kenya	Technical and Industrial Representations Ltd., P.O. Box 45375, Nairobi. Tel: 26936/7 Telex: 22381 Flight Cables: Techind Nairobi
Kuwait	United Trading & Technical Services Est., P.O. Box 2208, Kuwait. Tel: 813447 Telex: KT2147 Cables: Uniservco Kuwait
Malaysia (West)	The General Electric Co. of Malaysia Sendirian Berhad, P.O. Box 225, Jalan Sultan, Petaling Jaya. Tel: 03-771188 Telex: MA 37617 Cables: Geclumpur Kuala Lumpur
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: 017 75865 Acosame Cables: Asa Mexico City
Netherlands	SAIT Electronics Nederland, Strevelsweg 700/507, Rotterdam 3021. Tel: 010 814 644, 010 814 841 Telex: 28915
New Zealand	EEV Products: AWA New Zealand Limited, Wi-neera Drive, Porirua, P.O. Box 50-248. Tel: PRO 75-069 Telex: AWA NZ 31001 M-OV Products: GEC (New Zealand) Ltd., P.O. Box 50-244 Porirua. Tel: 75 409 Telex: 3421
Norway	Norsk Marconi A.S., Instrument & Components Dept., Ryensvingen 5, P.O. Box 50, Manglerud, Oslo 6 Tel: 67 04 80 Telex: 16218 NMK N Cables: Marconi Oslo M-OV Telephone line arresters only: British Imports A.S., P.O. Box 2582 Solli, Oslo 2. Tel: 4159 35 Telex: 16743